

**SURVEY REPORT**

**OKLAHOMA FISHERIES MANAGEMENT PROGRAM**



**FISH MANAGEMENT SURVEY AND RECOMMENDATIONS**

**FOR**

**ARBUCKLE LAKE**

**2007**

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**2007**

## Performance Report

State: Oklahoma

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Project Title: Oklahoma Fisheries Management Program

Study Title: Surveys and Recommendations - Arbuckle Reservoir

Period Covered: 1 January 2007 - 31 December 2007

### ABSTRACT

Arbuckle Reservoir was sampled in 2007 by spring electrofishing and fall gillnetting to determine fish population trends. The overall abundance of largemouth bass was acceptable. The number of bass collected above the Protective Length Limit (PLR) increased from the last sample. Electrophoresis results in 2004 indicated that of the 2003-year class, 29% were pure Florida strain and 32% were F<sub>1</sub> hybrids. The number of spotted bass and smallmouth bass collected in the 2007 survey was low. A 254 mm minimum length limit on crappie was implemented in 1993. Number of crappie sampled by gill netting was acceptable. Fall trap netting was not conducted in 2007, but 2004 data indicated the overall abundance was low and good numbers of quality size crappie were present. Crappie age and growth data indicated overall growth rates were good. Abundance of white bass was the highest recorded. Channel catfish overall abundance increased from the last sample. Bluegill abundance increased from the last sample. The forage population consisting of gizzard shad, threadfin shad and inland silversides were abundant in the reservoir. Recommendations made include: 1. Stocking of Certified Florida bass in 2009 to help improve the genetics of the population. 2. Refurbishing existing brush fish attractors as needed. 3. (ODWC) Fisheries personnel should monitor the 330-406 mm PLR for black bass and the size structure of important sport and forage fishes by spring electrofishing, shoreline seining and fall gillnetting in 2009.

## INTRODUCTION

Arbuckle Reservoir impounds Guy Sandy, Buckhorn and Rock Creeks, 13.3 km Southeast of Sulphur in Murray County, Oklahoma (Figure 1). Arbuckle Reservoir covers 951.42 surface hectares and was constructed in 1967 by the Bureau of Reclamation. Arbuckle Reservoir has a mean depth of 9.4 m and a maximum depth of 24.3 m, a shoreline development ratio of 5.4, and a secchi disc visibility of around 120 cm in the main pool in August; turbidity is primarily from plankton. Fish habitat consists primarily of aquatic vegetation, rock and some flooded timber in the upper ends of the creek channels.

Fish species stocked in 2005 were Certified Florida bass (Table 1). Artificial habitat consists of 18 marked brush fish attractors and are refurbished as needed (Figure 2). A 356 mm minimum length limit on black bass was imposed January 1, 1979 in an attempt to prevent over harvest of the bass fishery. Stockpiling of smaller bass occurred with a subsequent decrease in angling pressure and catch rates. The length limit was modified to a 304 to 356 mm PLR in 1982. The length limit was again modified in January, 1987 to a 330 to 406 mm PLR to encourage anglers to creel fish 304 mm and smaller. The Oklahoma Fishery Research Laboratory (OFRL), after years of research on crappie in Arbuckle Reservoir, proposed a 254 mm minimum length limit on crappie to spread out angler harvest over two or more year classes to dampen the effort of erratic recruitment. This regulation went into effect on January 1, 1993, with positive results observed by the crappie population and anglers.

Primary reasons for this survey were to evaluate the effects of the PLR and to monitor the current status of the predator and prey populations. The reservoir was surveyed in 2007 by means of spring electrofishing and fall gillnetting.

## RESULTS

### Largemouth Bass

1. Largemouth bass abundance from 2007 spring electrofishing ( $C/f = 130.4$ ) was above the minimum acceptable value for a quality fishery ( $C/f = 40$ ). The total bass  $C/f$  has increased from the last sample (Table 2).
2. Seining was not conducted in 2007. However, in 2004 the  $C/f$  of Age 0+ largemouth bass from seining of 4.5 was above the minimum acceptable value ( $C/f = 1.0$ ), indicating adequate reproduction (Table 3). In 2007-spring electrofishing, the abundance of bass in all size groups was satisfactory. The abundance of bass in all size groups except one increased from the last sample.
3. Body condition values ( $W_r$ ) were satisfactory for all size groups. Condition values for < 200 mm and 200-299 mm size groups declined from the last sample.
4. Results of 2004 electrophoretic testing indicate that of the 2003-year class, 29% were pure Florida strain, 32% were  $F_1$  hybrids, 18% were  $F_x$  hybrids and 21% were pure northern strain bass.
5. Abundance, size structure and body condition values were excellent at Arbuckle Reservoir indicating a quality bass fishery. Since the 330 to 406 mm PLR went into effect in 1987 there has been an increase in the overall abundance of bass in most length groups. Abundance of bass  $\geq 407$  mm increased and was the highest ever recorded. Numbers of bass < 200 mm increased, indicating good recruitment of the 2006-year class.

### Spotted bass

1. Spotted bass were collected in low numbers during the 2007 spring electrofishing survey (Table 4).  
Seining was not conducted in 2007. However, in 2004 the  $C/f$  of Age 0+ spotted bass from seining of 1.72 was above the minimum acceptable value ( $C/f = 1.0$ ), indicating adequate reproduction (Tables 4 and 14).

### Smallmouth bass

1. Smallmouth bass were collected in small numbers during the 2007 spring electrofishing survey (Table 5).  
Seining was not conducted in 2007. However, in 2004 the C/f of Age 0+ smallmouth bass from seining of 1.92 was above the minimum acceptable value (C/f = 1.0), indicating adequate reproduction (Tables 5 and 14).

### Crappie combined (Gill Netting)

1. Crappie abundance from 2007-fall gillnetting (C/f = 0.25) was within the acceptable value for a quality fishery (C/f = 0.20). The total crappie C/f has increased compared to recent samples (Table 6).
2. In 2007-fall gill netting, the abundance of crappie  $\geq 200$  mm was within acceptable values (Table 6). The abundance of crappie increased compared to recent samples (Table 6).
3. Body condition values ( $W_r$ ) were satisfactory for all size groups.
4. Abundance of crappie in Arbuckle Reservoir was good. Numbers of crappie  $< 200$  mm and  $\geq 250$  mm in length increased from the last sample.

### Crappie combined (2004: Trap Netting)

1. Trap netting was not conducted in 2007. However, crappie abundance from 2004 fall trap netting (C/f = 9.12) was below the minimum acceptable value for a quality fishery (C/f  $\geq 25$ ) (Table 7). The total crappie C/f has decreased from the last sample (Table 7).
2. In 2004 fall trap netting, the abundance of crappie in  $<300$  mm,  $>130$  mm and  $\geq 200$  mm size groups were unsatisfactory, while those  $\geq 250$  mm size groups were above acceptable values. The abundance of crappie  $<130$  mm and  $\geq 250$  mm increased from the last sample (Table 7).
3. Body condition values ( $W_r$ ) were satisfactory for all size groups. Condition values for  $>130$  mm improved from the most recent sample.

4. Age and growth data from the 2004 trap netting survey indicated that growth rates for all size groups were above acceptable values (Table 8).
5. Abundance of crappie in Arbuckle Lake was low, but there were good numbers of quality size  $\geq 250$  mm crappie. Numbers of crappie  $<130$  mm in length increased from the last sample, indicating better survival of young of the year crappie is occurring (Table 7). The overall growth rates for crappie were good (Table 8).

#### White bass

1. White bass abundance from 2007 fall gillnetting ( $C/f = 0.99$ ) was above the minimum acceptable value for a quality fishery ( $C/f = 0.20$ ). The total white bass  $C/f$  increased compared to recent samples (Table 9).
2. The abundance of white bass in all size groups was satisfactory and increased compared to recent samples (Table 9).
3. Body condition values ( $W_r$ ) were satisfactory for all size groups (Table 9).
4. Abundance of white bass in Arbuckle Reservoir is high. Recruitment was good in 2007 and there continues to be a good number of quality size white bass in the reservoir.

#### Channel Catfish

1. Channel catfish abundance from 2007 gillnetting ( $C/f = .26$ ) was above the minimum acceptable value for a quality fishery ( $C/f = .20$ ). The total channel catfish  $C/f$  has increased in recent samples (Table 10).
2. The abundance of channel catfish in all size groups was satisfactory. The abundance of channel catfish in all size groups increased from the most recent sample.
3. Body condition values ( $W_r$ ) were slightly below acceptable values for all size groups. Condition values in all size groups decreased from the most recent sample.

4. **Abundance of channel catfish increased and was the highest ever recorded. The overall size structure also increased compared to recent samples. Channel catfish reproductive success appears to have increased slightly in 2007.**

### **Bluegill**

1. **Bluegill abundance from 2007 spring electrofishing ( $C/f = 28.4$ ) was below the minimum acceptable value for a quality forage supply ( $C/f \geq 45$ ). The total bluegill  $C/f$  increased slightly compared to the 2004 sample (Table 11).**
2. **Seining was not conducted in 2007. However, the 2004 seining  $C/f$  for bluegill of 0.54 was below the minimum acceptable value ( $C/f = 1.0$ ), indicating inadequate reproduction. In 2007-spring electrofishing, the abundance of bluegill in all size groups was unsatisfactory. The abundance of bluegill in all size groups increased slightly compared to the last sample.**
3. **Body condition values ( $W_r$ ) for all size groups were satisfactory and have remained stable from the most recent sample (Table 11).**
4. **Abundance of bluegill and the overall size structure in Arbuckle Reservoir has remained stable compared to recent samples. The below acceptable catch rates could be attributed to the cool water temperatures during the sample period.**

### **Gizzard shad**

1. **Shad abundance from 2007-fall gillnetting ( $C/f = 0.52$ ) was above the minimum acceptable value for a quality forage supply ( $C/f = 0.20$ ). The total shad  $C/f$  for gillnetting increased from the most recent sample (Table 12). Gillnetting still appears to be the best method to sample the shad population.**
2. **In fall gillnetting, 40% of the gizzard shad collected were above  $\geq 200$  mm in length, indicating they were too large for utilization by bass and small**

predatory fish. Numbers of shad  $\leq 200$  mm increased from the last sample and was the highest ever recorded (Table 12).

3. In fall gillnetting, body condition values ( $W_r$ ) for shad  $\leq 200$  mm were not obtained.
4. The abundance of adult gizzard shad appears to be adequate and numbers of young gizzard shad have increased.

#### Species with insufficient sample size

1. Good numbers of threadfin shad were collected by fall gillnetting in 2007. The abundance of threadfin shad improved from recent samples and should provide forage for the many predators in the reservoir (Table 13).
2. Shoreline seining was not conducted in 2007. However, abundance of inland silversides collected by shoreline seining on Arbuckle Reservoir in 2004 has improved from the last sample and should contribute to the forage population (Table 13).

## RECOMMENDATIONS

### Fish Stockings

1. A total of 47,000 Certified Florida bass should be stocked in 2009 to help improve the genetics of the population.

### Habitat Enhancement

1. Existing brush fish attractors will be refurbished as needed. The buoys will be inspected during 2008.

### Fish Surveys

1. (ODWC) Fisheries personnel should monitor the 330 to 406 mm PLR on black bass and the size structure of important sport and forage fish in 2009 by spring electrofishing, shoreline seining and fall gillnetting.

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Figure 1: Arbuckle Lake Sampling Sites



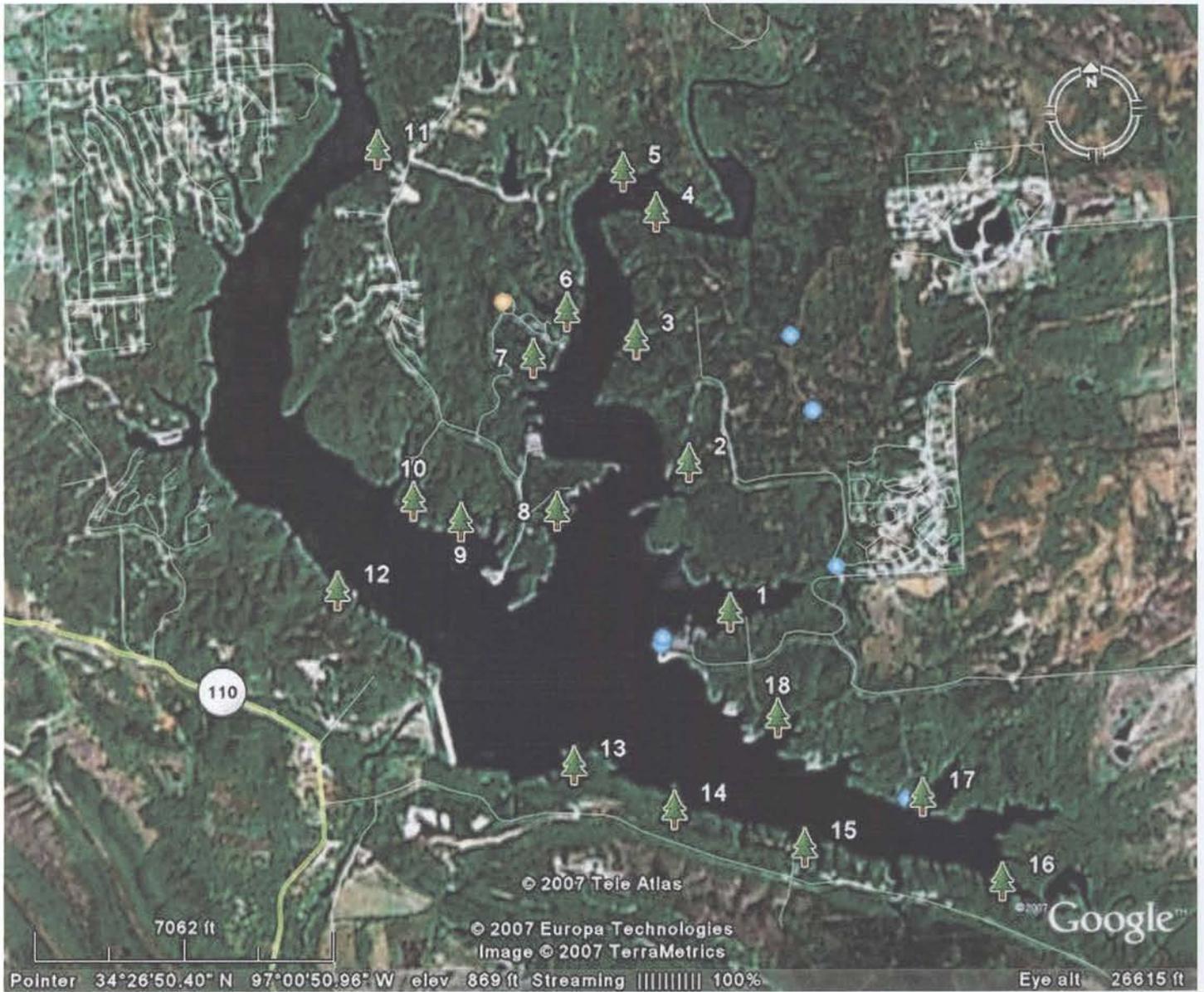
**SSP Sampling Sites:**

Spring Electrofishing - ○

Fall Gillnetting - ●

Shoreline Seining - S

Figure 2: Arbuckle Lake Habitat Map



 Habitat locations

**Table 1. Species, number and size of fish stocked in Arbuckle Lake, from 1984 to 2007.**

<b>DATE</b>	<b>SPECIES</b>	<b>NUMBER</b>	<b>SIZE</b>
1984	Walleye	235,000	Fry
1984	Threadfin shad	6,000	Adults
1985	Threadfin shad	4,750	Adults
1985	Walleye	245,000	Fry
1985	Blue Catfish	24,150	Fingerlings
1986	Smallmouth Bass	41,500	Fingerlings
1987	Smallmouth bass	30,080	Fingerlings
1987	Channel catfish	20,320	Fingerlings
1991*	Smallmouth bass	13,200	Fingerlings
1991	Blue catfish	25,302	Fingerlings
1992	Channel catfish	44,625	Fingerlings
1996	Florida bass	50,188	Fingerlings
1997	Florida bass	47,028	Fingerlings
1998	Florida bass	47,096	Fingerlings
1999	Florida bass	72,056	Fingerlings
2000	Florida bass	47,607	Fingerlings
2000*	Smallmouth bass	47,420	Fingerlings
2001*	Smallmouth bass	23,500	Fingerlings
2003	C. Florida bass	47,290	Fingerlings
2005	C. Florida bass	47,110	Fingerlings

Table 2. Total number (No.), catch rates (C/f), and relative weights ( $W_r$ ) by size groups of Largemouth bass collected by spring electrofishing from Arbuckle Lake. Numbers in parentheses represent acceptable C/f values for a quality fishery. Acceptable  $W_r$  values are  $\geq 90$ .

Year	Total ( $\geq 40$ )		<200 mm (15-45)		200-299 mm (15-30)		$\geq 300$ mm ( $\geq 15$ )		$\geq 356$ mm ( $\geq 10$ )		330-406 mm		$\geq 407$ mm	
	No.	C/f	C/f	$W_r$	C/f	$W_r$	C/f	$W_r$	C/f	$W_r$	C/f	$W_r$	C/f	$W_r$
1982	461	49.8	18.8	115	20.5	98	10.4	88	1.4	95	4.1	85	0.5	103
1984	855	74.3	20.9	95	23.0	88	30.3	82	5.0	83	16.3	80	1.6	87
1986	176	100.7	16.0	86	56.0	90	28.6	88	8.6	94	11.4	86	3.4	103
1988	186	106.3	15.4	89	24.0	89	66.9	94	35.4	98	46.3	93	8.6	109
1991	313	104.3	32.7	96	39.7	98	32.0	95	17.0	97	18.7	94	7.0	95
1994	174	139.2	24.0	88	48.8	91	66.4	90	31.2	92	37.6	88	12.8	96
1996#	263	175.3	18.0	93	70.0	91	87.3	91	48.7	93	52.7	90	18.0	96
1998*	69	138.0	44.0	95	46.0	92	48.0	90	24.0	92	20.0	91	10.0	95
1998#	86	114.7	13.3	99	32.0	95	69.3	90	33.3	87	32.0	90	14.7	88
2001	146	116.8	27.2	88	19.2	90	70.4	88	45.6	89	38.4	88	21.6	89
2004	394	87.6	5.7	105	27.6	96	54.2	89	25.3	90	29.8	88	10.4	94
2007	587	130.4	17.1	92	18.4	94	94.9	92	57.3	93	53.1	92	24.9	94

2004 started a new minimum of 4.5 hours Electrofishing on Arbuckle Lake.

\*Day Electrofishing

#Night Electrofishing

**Table 3. Total number (No.), catch rates (C/f), of largemouth bass collected at Arbuckle Reservoir by shoreline seining, from 1982 to 2004.**

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		Age 0 ( $\geq 1.0$ )
<b>Year</b>	<b>No.</b>	<b>C/f</b>
1982	84	6.90
1984	196	4.83
1986	154	8.43
1988	182	8.97
1991	22	1.08
1994	65	3.20
1996	27	3.20
1998	332	16.35
2001	161	7.93
2004	92	4.53

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Table 4. Total number (No.), catch rates (C/f), and relative weights (W<sub>r</sub>) by size groups of spotted bass collected by spring electrofishing and seining from Arbuckle Lake. Acceptable W<sub>r</sub> values are  $\geq 90$ .

Year	Total <sup>1</sup> ( $\geq 40$ )		<200 mm <sup>1</sup> (15-45)		200-299 mm <sup>1</sup> (15-30)		$\geq 300$ mm <sup>1</sup> ( $\geq 15$ )		$\geq 356$ mm <sup>1</sup> ( $\geq 10$ )		Age 0 <sup>2</sup> (1.0)
	No.	C/f	C/f	W <sub>r</sub>	C/f	W <sub>r</sub>	C/f	W <sub>r</sub>	C/f	W <sub>r</sub>	C/f
1982	56	6.1	0.9	87	3.1	85	2.1	90	0.5	99	-
1984	213	18.5	7.2	76	8.9	80	2.4	78	.08	79	.49
1986	32	0.6	.01	-	0.5	91	0.1	55	.06	33	.05
1988	18	10.3	1.7	64	2.3	78	6.3	75	-	-	1.3
1991	23	7.7	3.3	-	3.3	80	1.0	99	-	-	.15
1994	22	17.6	2.4	-	11.2	77	4.0	80	0.8	73	.15
1996	18	12.0	4.7	79	4.0	80	3.3	82	-	-	.25
1998*	32	42.7	14.7	-	16.0	89	12.0	87	-	-	.10
2001	8	6.4	-	-	0.8	96	5.6	89	1.6	91	-
2004	2	0.44	-	-	.22	93	.22	77	.22	77	1.72
2007	7	1.60	-	-	.22	91	1.3	97	.89	97	-

2004 started a New minimum of 4.5 hours Electrofishing on Arbuckle.

<sup>1</sup> Spring electrofishing

<sup>2</sup> Seining

\*Night electrofishing

Table 5. Total number (No.), catch rates (C/f), and relative weights ( $W_r$ ) by size groups of smallmouth bass collected by spring and fall electrofishing from Arbuckle Lake. Numbers in parentheses represent acceptable C/f values for a quality fishery. Acceptable  $W_r$  values are  $\geq 90$ .

Year	No.	Total <sup>1</sup> ( $\geq 15$ )	<200 mm <sup>1</sup> (15-45)		200-299 mm <sup>1</sup> (15-30)		$\geq 300$ mm <sup>1</sup> ( $\geq 15$ )		$\geq 356$ mm <sup>1</sup> ( $\geq 2$ )		Age 0 <sup>2</sup> (1.0)
		C/f	C/f	$W_r$	C/f	$W_r$	C/f	$W_r$	C/f	$W_r$	C/f
1996	2	1.3	1.3	-	-	-	-	-	-	-	-
1998*	14	18.7	18.7	-	-	-	-	-	-	-	0.20
2001	5	2.4	1.6	-	0.8	79	-	-	-	-	1.58
2001*	21	21.0	4.0	-	14.0	-	3.0	-	1.0	-	-
2004	4	0.89	-	-	0.44	87	0.89	84	0.44	81	1.92
2007	7	1.60	0.22	-	0.44	77	0.89	85	0.67	85	-

2004 started a new minimum of 4.5 hours Electrofishing on Arbuckle.

<sup>1</sup> Spring electrofishing

<sup>2</sup> Seining

\*Night electrofishing

Table 6. Total number (No.), catch rates (C/f), and relative weights ( $W_r$ ) by size groups of crappie collected by gill netting from Arbuckle Lake. Numbers in parentheses represent acceptable C/f values for a quality fishery. Acceptable  $W_r$  values are  $\geq 90$ .

Year	Total ( $\geq .20$ )		<200 mm (.05-.30)		$\geq 200$ mm ( $\geq .08$ )		$\geq 250$ mm ( $\geq .04$ )	
	No.	C/f	C/f	$W_r$	C/f	$W_r$	C/f	$W_r$
1982	31	0.10	-	-	.100	102	.080	101
1984	14	0.05	.010	115	.040	92	.010	90
1986	20	0.10	.060	80	.030	93	.010	96
1988	5	0.02	.010	78	.009	85	.004	86
1991	12	0.06	.020	87	.040	98	.010	90
1994	26	0.11	.009	104	.100	101	.040	101
1996	22	0.10	-	-	0.10	96	0.05	93
1998	34	0.15	.009	128	0.14	96	0.09	93
2001	8	0.04	0.02	134	0.03	108	0.01	97
2004	18	0.09	.005	-	0.08	104	0.06	104
2007	22	0.25	0.030	86	0.076	90	0.072	89

Shoreline Seining 2001, 84 crappie collected for a C/f = 4.14

Table 7. Total number (No.), catch rates (C/f), and relative weights ( $W_r$ ) by size groups of crappie collected by trap netting from Arbuckle Lake. Numbers in parentheses represent acceptable C/f values for a quality fishery. Acceptable  $W_r$  values are  $\geq 90$ .

Year	Total ( $\geq 25$ )		<130 mm ( $\geq 5$ )		>130 mm (10-40)		$\geq 200$ mm ( $\geq 10$ )		$\geq 250$ mm ( $\geq 4$ )	
	No.	C/f	C/f	$W_r$	C/f	$W_r$	C/f	$W_r$	C/f	$W_r$
1985	285	8.88	.10	89	8.88	89	6.0	90	1.9	93
1987	224	7.44	.24	98	7.20	94	7.0	94	4.6	94
1989	71	1.20	-	-	1.20	95	1.2	95	0.5	95
1990	143	3.60	.72	88	2.90	91	2.2	93	1.2	93
1992	161	4.08	-	-	4.00	97	4.0	97	1.9	97
1993	114	2.88	-	-	2.88	93	2.6	93	1.0	92
1994	171	4.54	-	-	4.54	95	4.2	96	1.6	96
1996	479	12.0	.50	200	11.5	95	10.3	96	5.3	94
2004	174	9.12	.96	-	8.16	104	6.9	96	6.0	93

**Table 8. Mean length at age of crappie collected by trap netting from Arbuckle Lake. Numbers in parentheses represent values for acceptable growth rates.**

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<b>Year</b>	<b>Age 1 (&gt;160 mm)</b>	<b>Age 2 (&gt;200 mm)</b>	<b>Age 3 (&gt;225 mm)</b>	<b>Age 4 (&gt;250 mm)</b>
1984	201	254	-	-
1985	210	268	300	-
1986	179	279	-	355
1987	218	256	275	250
1988	204	275	274	370
1989	237	276	-	297
1990	237	289	310	230
1991	224	287	279	310
1992	236	276	330	-
1993	223	273	290	-
1994	225	278	290	305
1996	228	275	301	307
2004	223	265	277	290

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Table 9. Total number (No.), catch rates (C/f), and relative weights ( $W_r$ ) by size groups of white bass collected by gill netting from Arbuckle Lake. Numbers in parentheses represent acceptable C/f values for a quality fishery. Acceptable  $W_r$  values are  $\geq 90$ .

Year	Total ( $\geq 20$ )		<200 mm ( $\geq .05$ )		200-299 mm (.05-.30)		$\geq 300$ mm ( $\geq .10$ )	
	No.	C/f	C/f	$W_r$	C/f	$W_r$	C/f	$W_r$
1982	76	.24	.09	94	.03	95	.13	88
1984	49	.20	.03	103	.09	90	.08	78
1986	61	.29	-	-	.11	84	.18	85
1988	27	.12	-	-	.08	90	.04	78
1991	124	.57	.08	76	.44	87	.06	84
1994	119	.52	.06	98	.33	95	.13	90
1996	115	.50	.05	83	.36	93	.09	81
1998	180	.81	.23	94	.33	93	.25	86
2001	64	.31	.02	100	.08	101	.22	84
2004	27	.12	.005	117	.05	97	.07	84
2007	200	.99	0.114	93	.36	94	.52	88

Table 10. Total number (No.), catch rates (C/f), and relative weights ( $W_r$ ) by size groups of channel catfish collected by gill netting from Arbuckle Lake. Numbers in parentheses represent acceptable C/f values for a quality fishery. Acceptable  $W_r$  values are  $\geq 90$ .

Year	Total ( $\geq .20$ )		<300 mm ( $\geq .10$ )		$\geq 300$ mm ( $\geq .10$ )		$\geq 400$ mm ( $\geq .05$ )	
	No.	C/f	C/f	$W_r$	C/f	$W_r$	C/f	$W_r$
1982	38	.12	.03	84	.09	92	.07	95
1984	31	.13	.02	82	.11	99	.07	110
1986	20	.10	.01	67	.09	77	.04	79
1988	31	.14	.03	71	.11	88	.08	93
1991	23	.11	.03	61	.07	91	.05	96
1994	41	.18	.10	82	.08	88	.04	98
1996	19	.08	.01	67	.07	83	.04	91
1998	35	.16	.06	71	.10	80	.05	78
2001	26	.13	.01	79	.12	91	.06	97
2004	23	.11	.03	105	.07	91	.04	95
2007	55	.26	.11	88	.15	84	.12	85

Table 11. Total number (No.), catch rates (C/f), and relative weights ( $W_r$ ) by size groups of bluegill collected by spring electrofishing and seining from Arbuckle Lake. Numbers in parentheses represent acceptable C/f values for a quality fishery. Acceptable  $W_r$  values are  $\geq 90$ .

Year	Total <sup>1</sup> ( $\geq 45$ )		<75 mm <sup>1</sup> ( $\geq 10$ )		75-149 mm <sup>1</sup> (20-100)		$\geq 150$ mm <sup>1</sup> ( $\geq 15$ )		<100 mm <sup>2</sup> (1.0)	
	No.	C/f	C/f	$W_r$	C/f	$W_r$	C/f	$W_r$	No.	C/f
1982	161	17.4	0.22	-	11.7	141	5.5	116	238	19.5
1984	372	32.3	6.78	-	19.9	112	5.7	115	174	4.3
1986	164	3.1	0.29	-	2.2	79	0.7	90	67	3.7
1988	341	194	20.5	-	137	83	37.1	88	58	2.9
1991	174	58	8.0	-	31.6	82	18.3	98	140	6.9
1994	214	171	8.0	-	90.4	73	72.8	92	48	2.4
1996	219	146	5.3	-	88.0	93	52.7	96	12	0.6
1998*	74	148	16.0	-	90.0	92	42.0	93	287	14.1
1998#	152	202.7	48.0	-	121.3	95	33.3	99	-	-
2001	99	79.2	18.4	-	36.8	78	30.3	97	83	4.1
2004	120	26.7	4.0	-	9.8	100	12.9	103	11	.54
2007	128	28.4	6.4	-	14.9	99	7.8	103	-	-

2004 started a new minimum of 4.5 hours of Electrofishing on Arbuckle.

<sup>1</sup> Spring electrofishing

<sup>2</sup> Seining

\* Day electrofishing

# Night electrofishing

Table 12. Total number (No.), catch rates (C/f), and relative weights ( $W_r$ ) by size groups of gizzard shad collected by spring electrofishing, gill netting, and seining from Arbuckle Lake. Numbers in parentheses represent acceptable C/f values for a quality fishery. Acceptable  $W_r$  values are  $\geq 90$ .

Year	Total <sup>1</sup> ( $\geq 40$ )		<200 mm <sup>1</sup> ( $\geq 20$ )		Total <sup>2</sup> ( $\geq 20$ )		<200 mm <sup>2</sup> ( $\geq 10$ )		Age 0 <sup>3</sup> -	
	No.	C/f	C/f	$W_r$	No.	C/f	C/f	$W_r$	No.	C/f
1982	55	5.95	2.00	144	42	0.13	0.13	86	-	-
1984	60	5.22	0.08	121	60	0.25	0.07	133	-	-
1986	-	-	-	-	52	0.25	0.02	74	-	-
1988	54	30.8	0.57	48	69	0.31	-	-	-	-
1991	33	11.0	1.67	101	62	0.29	0.01	49	-	-
1994	8	6.4	-	-	73	0.32	.004	105	-	-
1996	39	26.0	-	-	65	0.28	-	-	-	-
1998	-	-	-	-	75	0.34	0.03	98	-	-
2001	-	-	-	-	96	0.47	0.14	78	-	-
2004	-	-	-	-	92	0.40	.005	-	-	-
2007	-	-	-	-	105	0.52	0.21	-	-	-

<sup>1</sup> Spring electrofishing

<sup>2</sup> Gill netting

<sup>3</sup> Seining

Table 13. Total number (No.) and catch rates (C/f) of threadfin shad and silversides collected by spring electrofishing, gill netting, and seining from Arbuckle Lake.

Year	Threadfin shad				Silversides			
	Total <sup>1</sup>		Total <sup>2</sup>		Total <sup>3</sup>		Total <sup>3</sup>	
	No.	C/f	No.	C/f	No.	C/f	No.	C/f
1982	-	-	1	.003	-	-	225	18.5
1984	-	-	27	0.11	-	-	11974	295
1986	206	117	5	0.03	-	-	968	47.7
1988	12	6.9	2	.009	-	-	1584	78.0
1991	34	11.3	17	0.08	2	0.10	1727	85.1
1994	-	-	48	0.21	-	-	7374	363
1996	1	0.67	17	0.07	-	-	379	18.7
1998	6	12.0	66	0.30	-	-	5297	261
2001	-	-	8	0.04	-	-	350	17.2
2004	-	-	67	0.30	-	-	905	44.6
2007	-	-	413	2.01	-	-	-	-

<sup>1</sup> Spring electrofishing

<sup>2</sup> Gill netting

<sup>3</sup> Seining

**Table 14. Total number (No.) and catch rates (C/f) of fish collected by shoreline seining from Arbuckle Lake in 2004.**

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		<b>Age 0 (<math>\geq 1.0</math>)</b>
<b>Species</b>	<b>No.</b>	<b>C/f</b>
Spotted bass	35	1.72
Smallmouth bass	39	1.92
White crappie	06	0.30
Bluegill sunfish	11	0.54
Silversides	905	44.6
Golden shiners	02	0.10

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**OKLAHOMA RESERVOIR FACT SHEET**  
YEAR OF SURVEY 2007



**LAKE NAME:** Arbuckle Lake

**SURFACE ACRES:** 2,350

**AVG DEPTH (ft):** 30

**LOCATION:** 8 miles Southeast of Sulphur OK.

**COUNTY:** Murray

**DATE IMPOUNDED:** 1967    **OPERATOR:** Bureau of Reclamation

**PHONE:** 580-622-3163

**PRIMARY USES:** Water supply, Flood control, Fish and Wildlife recreation

**PUBLIC USE FACILITIES:** Boat ramps, Toilets, Fishing docks, Camping and Picnicking

**NOTABLE CHARACTERISTICS OF LAKE OR FISHERY:** Largemouth bass abundance remains high. The 13-16 inch PLR on black bass is working out well. Crappie population remains low. Fair numbers of white bass in the lake.

**STATUS OF FISHERY**

<b>SPORT FISH</b>	<b>TOTAL ABUNDANCE</b>	<b>QUALITY SIZE ABUNDANCE</b>	<b>QUALITY SIZE</b>
Largemouth bass	HIGH	HIGH	≥ 14"
Spotted bass	LOW	LOW	≥ 14"
Smallmouth bass	LOW	LOW	≥ 14"
Crappie	MOD.	MOD.	8"
White bass	HIGH	HIGH	12"
Channel Catfish	MOD.	HIGH	16"

**SPECIAL REGULATIONS:** There is a 13 to 16 inch protective length range on all black bass. Effective in 1993 all crappie less than 10 inches must be returned to the water unharmed immediately after being taken.

**HABITAT TYPES STATUS AND IMPROVEMENTS:** Shoreline is fairly steep and rocky and provides adequate habitat. Marked brush fish attractors have been constructed around the reservoir.

**MANAGEMENT STRATEGY:** Refurbishing marked brush fish attractors as needed.

**OTHER COMMENTS:** Fishery personnel should monitor 13-16 inch PLR on black bass, and monitor size structure on sport and forage fish in 2009.