

SURVEY REPORT
OKLAHOMA FISHERIES MANAGEMENT PROGRAM



FISH MANAGEMENT SURVEY AND RECOMMENDATIONS
FOR
ATOKA BLUESTEM LAKE
2007

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ATOKA BLUESTEM LAKE

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Performance Report

State: Oklahoma

Grant: F-67-D-2

Project Title: Oklahoma Fisheries Management Program

Study Title: Surveys and Recommendations - Atoka Bluestem Lake

Period Covered: 1 January 2007 - 31 December 2007

ABSTRACT

Atoka Bluestem Lake was sampled in 2007 by fall trap netting to check the crappie population. The overall abundance of crappie was low in the lake. Numbers of crappie in all size groups were low, except those ≥ 250 mm. Age and growth data from trap netting indicated crappie in all size groups except age 1 were growing at a good rate. Age four crappie are 12.0 inches long. Recruitment of small crappie improved during 2007.

Recommendations include: stocking saugeye into the lake in 2008 as a management tool to help improve the crappie population. Oklahoma Department Of Wildlife Conservation (ODWC) Fisheries personnel should conduct a fall trap netting survey in 2011 to evaluate the effects saugeye are having on the crappie population.

INTRODUCTION

Atoka Bluestem Lake impounds a tributary of the North Boggy Creek, 13 km North of Atoka in Atoka County, Oklahoma (Figure 1). Atoka Bluestem Lake covers 28.3 surface hectares and was constructed in 1932 by the Oklahoma Department of Corrections. Atoka Bluestem Lake has a mean depth of 2 m, a maximum of 6 m and a secchi disc visibility of around 30 cm in the main pool in August. Turbidity is primarily from suspended clay. Fish habitat consists primarily of aquatic vegetation, rock and button willows around the shoreline. Fish species stocked in 2005 and 2006 were saugeye (Table 1). No fish were stocked in 2007. Four new marked brush shelters were constructed in 1992 to improve the habitat for fish in the lake and have been refurbished as needed by (ODWC) fisheries personnel. There is no standing timber and the lake stays turbid most of the year due to suspension of colloidal clay particles.

Atoka Bluestem Lake was sampled in 2007 by fall trap netting to evaluate the crappie population.

RESULTS

Crappie Combined

1. Crappie abundance from 2007 fall trap netting ($C/f = 9.5$) was below the minimum acceptable value for a quality fishery (> 25). The total crappie C/f has increased compared to recent samples (Table 2).
2. The abundance of crappie in all size groups except those ≥ 250 mm was unsatisfactory. The abundance of crappie < 130 mm has improved compared to past samples.
3. Body condition values (W_r) were acceptable for crappie < 130 mm and near acceptable values for all other size groups. Condition values for all size groups have improved from past samples (Table 2).

4. Age and growth data from the 2007 trap netting survey indicated that growth rates for ages 2, 3 and 4 size groups were growing above acceptable rates. Growth rates for all age groups but one increased from the last sample (Table 3).
5. Abundance of crappie in Atoka Bluestem Lake was low. The crappie growth rates have improved from the last sample, indicating the saugeye are having a positive impact on the crappie growth rates. Recruitment of crappie <130 mm declined in 2007.

RECOMMENDATIONS

Fish Stockings

1. A total of 3,000-fingerling saugeye should be stocked in Atoka Bluestem Lake in 2008 as a management tool to help improve the crappie population.

Fish Surveys

1. (ODWC) Personnel should survey the lake by fall trap netting in 2011 to evaluate the effects saugeye are having on the crappie population.

Habitat Enhancement

1. Marked brush fish attractors should be refurbished as needed by (ODWC) fisheries personnel and buoys inspected each year.

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Figure 1: Atoka Bluestem Sampling Sites



SSP Sampling Sites:

Spring Electrofishing - Entire shoreline

Fall trap netting - ■

Figure 2: Atoka Bluestem Lake Habitat Map



Habitat locations

Table 1. Species, number and size of fish stocked in Atoka Bluestem Lake from 1980 to 2007.

Date.	Species	Number	Size
1980	Florida bass	9,330	Fingerlings
1980	largemouth bass	7,672	Fingerlings
1990	Channel catfish	900	Growouts
1991	Channel catfish	1,000	Fingerlings
1992	Threadfin shad	2,000	Adults
1992	Channel catfish	1,400	Fingerlings
1994	Channel catfish	1,400	Fingerlings
1996	C. Florida bass	1,400	Fingerlings
1998	saugeye	3,011	Fingerlings
1999	Saugeye	3,097	Fingerlings
2000	Saugeye	3,250	Fingerlings
2000	Threadfin shad	3,000	Adults
2001	Saugeye	4,200	Fingerlings
2002	channel catfish	1,028	Fingerlings
2003	Largemouth bass	5,000	Fingerlings

2003	Threadfin shad	2,000	Adults
2004	Saugeye	3,000	Fingerlings
2005	Saugeye	3,300	Fingerlings
2006	Saugeye	2,500	Fingerlings

Table 2. Total number (No.), catch rates (C/f), and relative weights (W_r) by size groups of crappie collected by trap netting from Lake Atoka Bluestem . Numbers in parentheses represent acceptable C/f values for a quality fishery. Acceptable W_r values are ≥ 90 .

		Total (>25)		<130 mm (≥ 5)		≥ 130 mm (10-40)		≥ 200 mm (≥ 10)		≥ 250 mm (≥ 4)	
Year	No.	C/f	C/f	W_r	C/f	W_r	C/f	W_r	C/f	W_r	
1997	130	16.8	6.5	73	10.3	78	6.2	83	2.9	87	
2001	55	6.0	0.2	52	5.8	77	3.6	82	1.2	83	
2004	50	5.5	0.9	69	4.6	73	3.6	78	0.9	78	
2007	68	9.5	0.55	95	8.93	85	5.98	88	5.42	88	

Table 3. Mean length at age of crappie collected by trap netting from Lake Atoka Bluestem. Numbers in parentheses represent values for acceptable growth rates.

Year	Age 1 (≥160 mm)	Age 2 (≥200 mm)	Age 3 (≥225 mm)	Age 4 (≥250 mm)
1997	90	108	150	208
2001	166	204	221	294
2004	117	210	243	305
2007	148	212	254	307



OKLAHOMA RESERVOIR FACT SHEET

YEAR OF SURVEY 2007



LAKE NAME: Atoka Bluestem **SURFACE ACRES:**70 **AVG DEPTH (ft):** 6.6

LOCATION: 8 miles North of Atoka, Okla. **COUNTY:** Atoka **DATE IMPOUNDED:**1932
OPERATOR: Okla Dept of Corrections **Phone:** 1- 580 - 346 - 7814

PRIMARY USES: Water supply, fishing and boating and camping

PUBLIC USE FACILITIES: Boat ramp and toilets.

NOTABLE CHARACTERISTICS OF LAKE OR FISHERY: The lake is shallow with gently sloping shoreline and bottom, water willows extend several feet from shore. The lake stays turbid much of the time due to the suspension of colloidal clay particles.

STATUS OF FISHERY

SPORT FISH	TOTAL ABUNDANCE	QUALITY SIZE ABUNDANCE	QUALITY SIZE
Largemouth bass	Moderate	Low	14 inches
Saugeye	Low	Low	12 inches
Bluegill sunfish	High	Low	6 inches
Crappie	Low	Low	8 inches

SPECIAL REGULATIONS: Same as state wide limits.

HABITAT TYPES STATUS AND IMPROVEMENTS: Aquatic vegetation and four marked fish attractors.

MANAGEMENT STRATEGY: Stocking saugeye in the lake as a management tool to help improve the crappie population.

OTHER COMMENTS: N/A