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SURVEY REPORT  
OKLAHOMA FISHERIES MANAGEMENT PROGRAM



FISH MANAGEMENT SURVEY AND RECOMMENDATIONS  
FOR  
LAKE VANDERWORK  
1993

INTRODUCTION

Performance Report

State: Oklahoma

Project No. F 44-5

Project Title: Oklahoma Fisheries Management Program

Study Title: Surveys and Recommendations - Lake Vanderwork

Period Covered: 1 January 1992 - 31 December 1993

LAKE VANDERWORK

ABSTRACT

Lake Vanderwork was sampled by fall gillnetting in 1992 and spring electrofishing in 1992 and 1993. Fall night electrofishing was also conducted in 1993. Largemouth bass were moderate in abundance. Adult largemouth bass ( $\geq 300\text{mm}$ ) were abundant in both samples, but small bass abundance was low. Crappie were moderate in abundance in the 1992 gillnet sample, but all were  $< 200\text{mm}$  in length. Channel catfish were also abundant. The fall night electrofishing C/f for saugeye increased from 2.0 in 1991 to 17.0 in 1993. The 1993 stocking was apparently much more successful. Bluegill abundance was also high, but most were intermediate in size. Gizzard shad are overabundant and in poor condition. Recommendations were made to conduct electrofishing surveys in fall 1994 and spring 1995. A drawdown is recommended for 1995; rip-rapped fishing berms will be constructed and the shoreline deepened.

## INTRODUCTION

Lake Vanderwork is located 13 km North of Gotebo in Washita County, Oklahoma (Fig. 1). Constructed in 1968 by the Oklahoma Department of Wildlife Conservation (ODWC), Lake Vanderwork covers 54 surface hectares, has a mean depth of 3.6 m, a maximum depth of 11.0 m, a shoreline development ratio of 4.0, and a secchi disc visibility of around 66 cm in the main pool in August; turbidity is primarily from plankton. Fish habitat consists of flooded timber and rip-rap on the dam. Lake Vanderwork receives moderate fishing pressure for largemouth bass, catfish, and crappie.

A 330-406 mm slot limit on bass was implemented in 1987 to relieve stockpiling of small bass. A drawdown in 1985 improved bass size, but bluegill abundance increased and size decreased.

A fertilization program was conducted from 1987 to 1992. Plankton blooms were originally maintained by the addition of 10-34-0 liquid fertilizer, but 0-52-0 was used during 1990-1992. Fertilization did not improve the bluegill fishery in the lake and was discontinued in 1992. Gizzard shad were first found in the lake in 1989, and their population expanded rapidly. Channel catfish and certified Florida largemouth bass are stocked annually, and saugeye were stocked in 1991 and 1993 (Table 1).

Lake Vanderwork was sampled by fall night electrofishing in 1991 and 1993 to evaluate saugeye stocking. Gill netting was conducted in fall 1992 to monitor the channel catfish population. Spring electrofishing was conducted in 1992 and 1993 to evaluate the effects of the fertilization program on bass and bluegill.

## RESULTS

### Largemouth Bass

1. Largemouth bass abundance from 1993 spring electrofishing (C/f=42.3) was comparable to the 1992 value (C/f=41.6), and was comparable to the minimum acceptable value for a quality fishery (C/f= 40). The total bass C/f has been stable in recent sample years (Table 2).
2. In 1992 and 1993 spring electrofishing, the abundance of bass  $\geq 300$ mm was satisfactory, while C/fs for those  $< 300$ mm were below acceptable values.
3. Body condition values ( $W_r$ ) were satisfactory for all size groups.
4. The bass abundance over 300 mm was excellent, but recent recruitment has been poor. Another electrofishing survey should be taken in 1995 to monitor this problem. Florida bass stockings have not been evaluated since not enough small bass have been captured for electrophoretic analysis.

### Crappie [combined]

1. Crappie abundance from 1992 gill netting (C/f=0.18) was comparable to the minimum acceptable value for a quality fishery (C/f=0.05-0.30, Table 3).
2. The abundance of crappie  $< 200$ mm was satisfactory, while those  $\geq 200$  mm were absent from the sample.
3. Body condition values ( $W_r$ ) were unsatisfactory for all crappie.

### Saugeye

1. Saugeye abundance from 1992 fall gill netting (C/f=0.07) was

below the minimum acceptable value for a quality fishery (C/f= 0.10), but saugeye had only been stocked one year previous to the sample (Table 4). Saugeye abundance from 1993 electrofishing (C/f=17.0) was above the minimum acceptable value for a quality fishery (C/f=15.0). Due to the 1993 stocking, the total saugeye C/f has increased in recent sample years (Table 5).

2. The abundance of saugeye <300mm was satisfactory, while those  $\geq$ 300mm were below acceptable values.
3. Body condition values ( $W_r$ ) were satisfactory for all size groups.
4. Saugeye survival from the 1991 stocking was apparently low; the C/f for fish  $\geq$ 400mm was only 1.0. Hopefully, fish from the 1993 year class will be able to better utilize the abundant shad population.

#### Channel Catfish

1. Channel catfish abundance from 1992 gill netting (C/f=0.41) was double the minimum acceptable value for a quality fishery (C/f=0.20). The total channel catfish C/f has increased since the last sample in 1982 (Table 6).
2. The abundance of channel catfish in all size groups was satisfactory.
3. Body condition values ( $W_r$ ) were unsatisfactory for all size groups.
4. The high abundance and low  $W_r$ s of channel catfish can probably be attributed to the increased stocking rate of growouts in 1987 to 1992.

## Bluegill

1. Bluegill abundance from 1993 spring electrofishing (C/f=117.0) was well above the minimum acceptable value for a quality forage supply. The total bluegill C/f has declined in recent sample years (Table 7).
2. The abundance of bluegill <75mm was below satisfactory, while those in the 75-149mm size group were above acceptable values for a fertilized bluegill fishery. The abundance of bluegill  $\geq 150$ mm increased in recent samples.
3. Body condition values ( $W_c$ ) were adequate for 75-149mm bluegill, but those  $\geq 150$ mm were in poor condition.
4. The majority of the bluegill population is still tied up in the intermediate (75-149mm) range. To achieve a quality bluegill fishery, the intermediate numbers should be reduced and more of the bluegill should grow into the  $\geq 150$ mm size class.

## Gizzard Shad

1. Shad abundance from 1993 spring electrofishing (C/f=138.7) was well above the minimum acceptable value (C/f= 40). Shad abundance from 1992 fall gill netting (C/f=0.18) was comparable to the minimum acceptable value (C/f= 0.2). The total shad C/f has declined in recent sample years (Table 8).
2. In 1993 spring electrofishing, the number of shad <200 mm was seven times the acceptable value, indicating an overabundance of shad. In 1992 fall gillnetting, the abundance of shad <200 mm was comparable to the acceptable

value, indicating a satisfactory forage supply. The abundance of shad <200 mm declined in recent samples.

3. In both spring electrofishing and fall gillnetting, body condition values ( $W_t$ ) were unsatisfactory for all size groups. Condition values for all size groups have been stable in recent samples.
4. The overabundance of shad at Lake Vanderwork has reduced the effectiveness of the fertilization program by increasing competition between shad and the overabundant intermediate bluegill population.

#### Redear

1. Only one redear was sampled by spring electrofishing in 1992, whereas four were captured in 1993.

#### Non-Game Species

1. Common carp, black bullheads and freshwater drum were moderately abundant in the 1992 gillnet sample, and their numbers are stable (Table 9).

### RECOMMENDATIONS

#### Habitat Enhancement

1. A drawdown and shoreline deepening project should begin in 1995. Dirt used in the excavation will be used to construct rip-rapped fishing jetties.

#### Fish Attractor Structures

1. The buoyed fish attractors at Vanderwork should be refurbished with new trees by 1995.

### Fish Stockings

1. Florida largemouth bass fingerlings should be stocked at 50/ha (2700) to maintain the trophy bass potential.
2. Saugeye fingerlings should be stocked at 50/ha (2700) to help reduce the overabundant shad and bluegill populations. Saugeye would also add to the sport fishing at Vanderwork.
3. Channel catfish growout stockings should be reduced to 50/ha (2700) annually until the W<sub>c</sub> improves.

### Fish Surveys

1. Night electrofishing should be conducted in fall, 1994 to evaluate saugeye stocking success.
2. Vanderwork should be electrofished in spring, 1995 to monitor changes in the bass/bluegill/shad populations.

### Fishing Regulations

1. The 330-406 mm slot limit on bass should be retained to maintain good bass fishing at Vanderwork.
2. The possession limit of six channel catfish should be retained to prevent their overharvest.
3. A "catch and release only" regulation on bass should be implemented in 1995 if the drawdown and berm construction plan is implemented.

Prepared by

Paul Watkins

Paul Watkins

Fisheries Technician

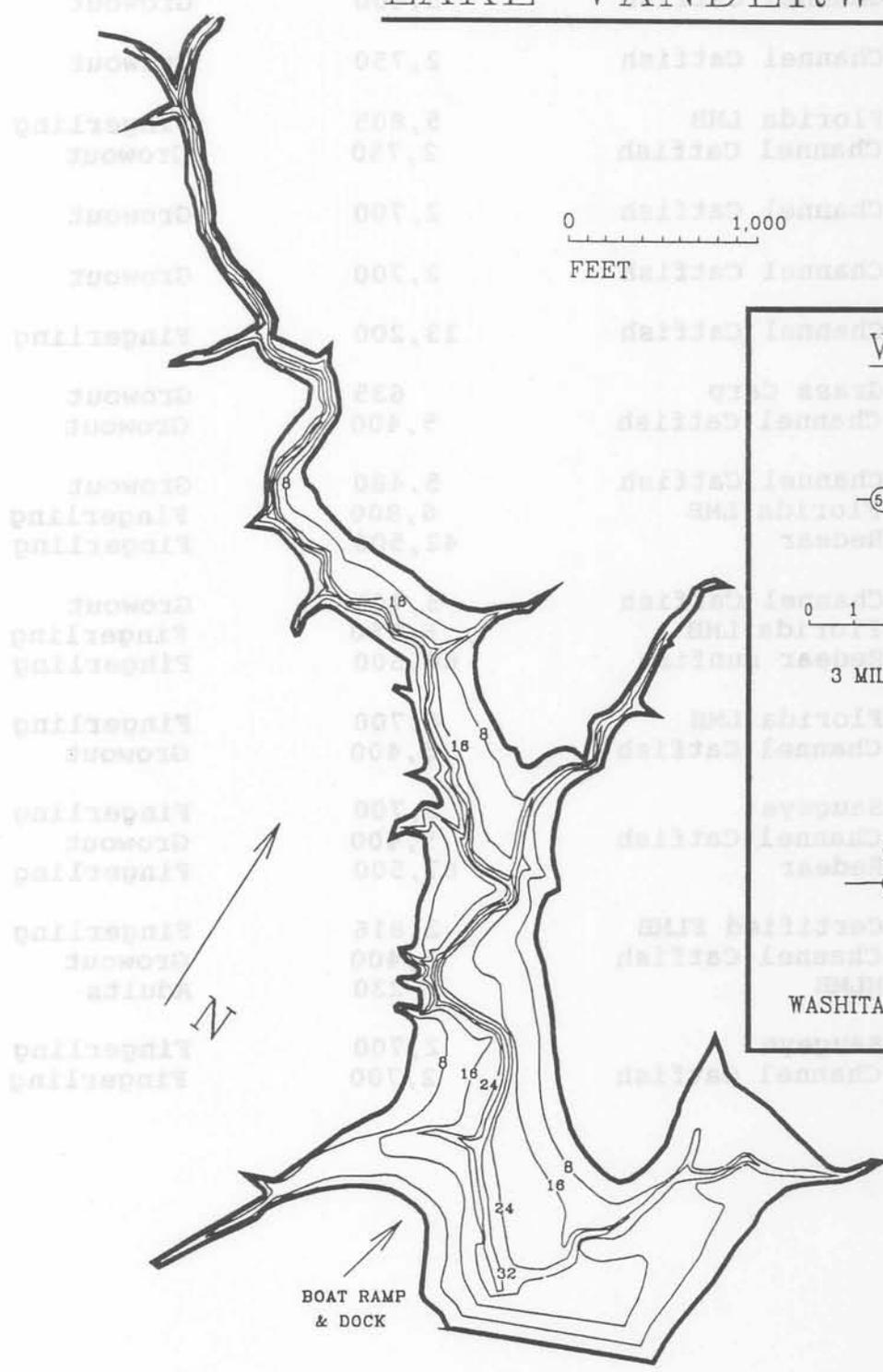
Approved by

Barry Bolton

Barry D. Bolton

Assistant Chief of Fisheries

# LAKE VANDERWORK



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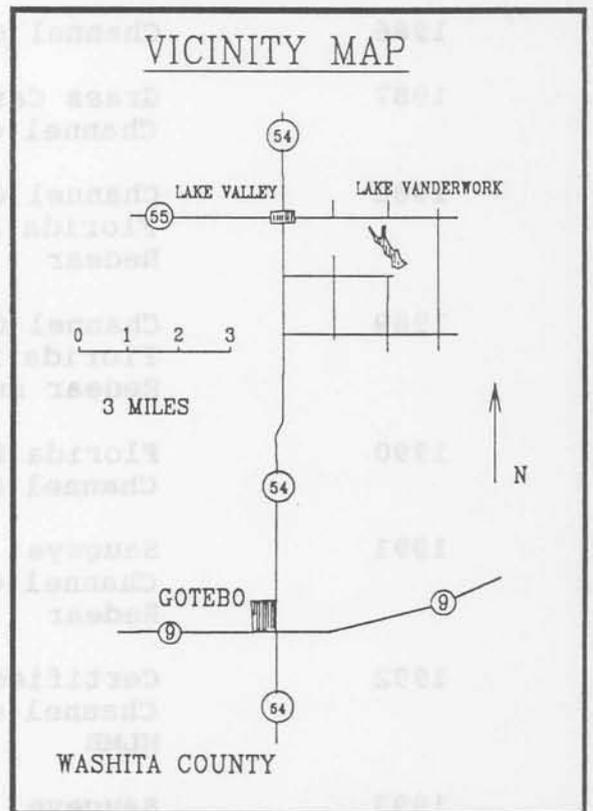


Table 1. Species, number and size of fish stocked in Lake Vanderwork, 1981-1993 .

DATE	SPECIES	NUMBER	SIZE
1981	Channel Catfish	5,400	Growout
1982	Channel Catfish	2,750	Growout
1983	Florida LMB	5,805	Fingerling
	Channel Catfish	2,750	Growout
1984	Channel Catfish	2,700	Growout
1985	Channel Catfish	2,700	Growout
1986	Channel Catfish	13,200	Fingerling
1987	Grass Carp	635	Growout
	Channel Catfish	5,400	Growout
1988	Channel Catfish	5,480	Growout
	Florida LMB	6,800	Fingerling
	Redear	42,500	Fingerling
1989	Channel Catfish	5,400	Growout
	Florida LMB	6,750	Fingerling
	Redear sunfish	64,500	Fingerling
1990	Florida LMB	6,700	Fingerling
	Channel Catfish	5,400	Growout
1991	Saugeye	2,700	Fingerling
	Channel Catfish	5,400	Growout
	Redear	67,500	Fingerling
1992	Certified FLMB	2,816	Fingerling
	Channel Catfish	5,400	Growout
	NLMB	230	Adults
1993	Saugeye	2,700	Fingerling
	Channel Catfish	2,700	Fingerling

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 Lake Vanderwork. 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 ( $\geq 10$ )	
	No.	C/f	C/f	$W_r$	C/f	$W_r$	C/f	$W_r$	C/f	$W_r$
1985	101	57.6	2.8	75	52.6	78	2.3	95	2.3	95
1987	114	41.4	0.8	-	4.4	-	17.2	-	16.4	-
1988	111	27.8	2.5	87	3.5	89	21.8	97	14.8	100
1989	96	24.0	3.5	87	5.0	100	15.5	99	13.5	100
1990	100	36.4	16.0	79	3.6	94	16.7	110	14.2	112
1992	104	41.6	2.4	-	1.2	81	38.0	103	33.6	103
1993	74	42.3	2.3	105	2.3	92	37.7	109	36.5	109

Table 3. Total number (No.), catch rates (C/f), and relative weights ( $W_r$ ) by size groups of crappie collected by gill netting from Lake Vanderwork. 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	$W_r$
1977	5	0.05						
1978	21	0.21						
1980	17	0.14						
1982	7	0.06						
1992	13	0.18	0.18	82	0	-	0	-

Table 4. Total number (No.), catch rates (C/f), and relative weights ( $W_r$ ) by size groups of saugeye collected by gill netting from Lake Vanderwork. Numbers in parentheses represent acceptable C/f values for a quality fishery. Acceptable  $W_r$  values are  $\geq 90$ .

Year	Total ( $>.10$ )		<300 mm ( $\geq.06$ )		300-399 mm ( $\geq.02$ )		$\geq 400$ mm ( $\geq.02$ )	
	No.	C/f	C/f	$W_r$	C/f	$W_r$	C/f	$W_r$
1991*								
1992	5	0.07	0	-	0.04	82	0.03	94

\*Saugeye were first stocked at Vanderwork in 1991.

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

Year	Total ( $\geq 15$ )		<300 mm ( $\geq 10$ )		300-399 mm ( $\geq 3$ )		$\geq 400$ mm ( $\geq 2$ )	
	No.	C/f	C/f	$W_r$	C/f	$W_r$	C/f	$W_r$
1991*	2	2.0	2	108	0	-	0	-
1993	17	17.0	16	91	0	-	1.0	92

\*Saugeye were first stocked at Vanderwork in 1991, and were not stocked in 1992.

Table 6. Total number (No.), catch rates (C/f), and relative weights ( $W_r$ ) by size groups of channel catfish collected by gill netting from Lake Vanderwork. 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	$W_r$
1977	55	0.50						
1978	20	0.20						
1980	8	0.07						
1982	31	0.26						
1992	30	0.41	0.23	85	0.18	84	0.12	83

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

Year	No.	Total ( $\geq 45$ )		<75 mm ( $\geq 10$ )		75-149 mm (20-100)		$\geq 150$ mm ( $\geq 15$ )	
		C/f	$W_r$	C/f	$W_r$	C/f	$W_r$	C/f	$W_r$
1985	94	75.2	0	-	20.8	86	54.4	80.4	
1987	112	448.0							
1988	182	364.0	0	-	336.0	90	10.0	77	
1989	97	194.0	0	-	25.6	84	0.3	56	
1990	120	80.0	3.3	-	74.0	78	2.7	68	
1992	129	172.0	2.7	-	162.7	91	5.3	74	
1993	117	117.0	3.0	-	98.0	94	16.0	87	

Table 8. Total number (No.), catch rates (C/f), and relative weights (W<sub>r</sub>) by size groups of gizzard shad collected by spring electrofishing and gill netting from Lake Vanderwork. Numbers in parentheses represent acceptable C/f values for a quality fishery. Acceptable W<sub>r</sub> values are  $\geq 90$ .

Year	Spring Electrofishing				Fall Gillnetting				Seining	
	Total ( $\geq 40$ )	<200 mm ( $\geq 20$ )		W <sub>r</sub>	Total ( $\geq 20$ )	<200 mm ( $\geq 10$ )		W <sub>r</sub>	Age 0	-
1989*	18	4.5	0	-						
1990	113	90.4	32.8	88						
1992	211	422.0	412.0	73	13	0.18	0.12	78		
1993	104	138.7	138.7	75						

\*Gizzard shad were first found in Vanderwork in 1989.

Table 9. Total number (No.) and catch rates (C/f) of non-game fish collected by gill netting from Lake Vanderwork.

Year	CRP		BBH		YBH		DRM		Total	
	No.	C/f	No.	C/f	No.	C/f	No.	C/f	No.	C/f
1977	7	0.06	58	0.52	6	0.05	0	-		
1978	78	0.76	23	0.23	3	0.03	0	-		
1980	13	0.11	21	0.18	2	0.02	1	0.01		
1982	21	0.18	7	0.06	0	-	0	-		
1992	4	0.05	6	0.08	0	-	2	0.03		

<sup>1</sup> BBH=black bullhead; YBH=yellow bullhead; DRM=freshwater drum; CRP=common carp; SBF=smallmouth buffalo; BBF=bigmouth buffalo; BUF=buffalo spp.; RCS=river carpsucker; RRH=river redhorse; LNG=longnose gar; SPG=spotted gar; SHG=shortnose gar; GAR=gar spp.