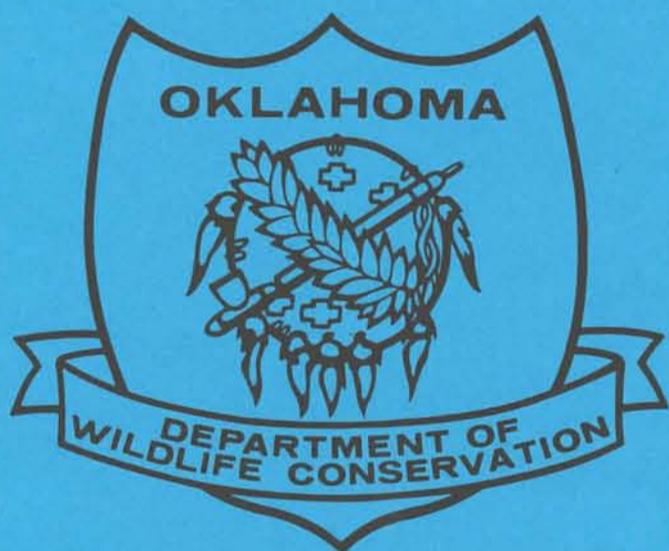


SURVEY REPORT
OKLAHOMA FISHERIES MANAGEMENT PROGRAM



FISH MANAGEMENT SURVEY AND RECOMMENDATIONS
FOR
FAIRFAX LAKE
1993

Performance Report

State: Oklahoma Project No. F 44-D-8

Project Title: Oklahoma Fisheries Management Program

Study Title: Surveys and Recommendations - Fairfax Lake

Period Covered: 1 January 1993 - 31 December 1993

LAKE FAIRFAX

ABSTRACT

Lake Fairfax was sampled by spring electrofishing and fall night electrofishing in 1993 to determine fish population trends and to evaluate the stocking success of smallmouth bass fingerlings. Largemouth bass were high in abundance and their population structure represented a high quality fishery. Smallmouth bass introduction appeared to be successful. Bluegill were providing abundant prey but gizzard shad were too low in abundance.

Recommendations were made to refurbish existing fish attractors, stock smallmouth bass, and conduct fall night electrofishing for smallmouth bass stocking evaluation.

INTRODUCTION

Fairfax Lake impounds Wild Creek, 5 km northwest of Fairfax in Osage County, Oklahoma (Figure 1). Fairfax lake covers 45 surface hectares and was constructed in 1935 primarily for a municipal

water supply and recreation. Fairfax lake has a mean depth of 4.9 m and a maximum depth of 10.4 m, a shoreline development ratio of 2.7, and a secchi disc visibility of around 13.4 cm in the main pool in August; turbidity is primarily from plankton. Fish habitat consists primarily of a combination of aquatic vegetation, rocky outcrops and small areas of submerged standing timber. Past surveys have shown a high density largemouth bass population comprised primarily of fish < 300 mm long in relatively poor condition. Crappie and channel catfish abundance has continued to be low but with satisfactory population structures and condition. Channel catfish natural recruitment has been consistently low, which is probably related to predation losses since spawning habitat appears to be adequate. Flathead catfish and gizzard shad have been relatively abundant. Gizzard shad and bluegill have continued to provide the bulk of the available forage (prey).

Four buoy marked brush piles were constructed for fish attractors in 1993. Smallmouth bass fingerlings were stocked in 1992 and 1993 in an attempt to eventually establish a reproducing population (Table 1).

Fairfax Lake was sampled in 1993 by spring electrofishing, summer electrofishing and fall night electrofishing to evaluate the status of the largemouth bass and flathead catfish populations and the survival of stocked smallmouth bass.

RESULTS

Largemouth Bass

1. Largemouth bass abundance from 1993 spring electrofishing ($C/f=118.2$) was considerably above the minimum acceptable value for a quality fishery ($C/f= 40$). The total bass C/f has increased in recent sample years (Table 2).
2. In 1993 spring electrofishing, the abundance of bass < 200 , >300 and > 356 mm was satisfactory, while those 200-299 mm were slightly above the acceptable value. The abundance of all bass size groups, except 200-299 mm fish, increased in recent samples.
3. Body condition values (W_r) were satisfactory for < 200 mm bass but those 200-299, > 300 and > 356 mm were in fair condition. Condition values for bass > 200 mm have declined, while those < 200 mm have improved in recent samples.
4. Abundance, size structure and body condition values were generally acceptable at Fairfax Lake, indicating a high quality bass fishery (Figure 2). These indices represent a dramatic improvement in the fishery compared to the early 1980's.

Smallmouth bass

1. Smallmouth bass abundance from 1993 spring electrofishing ($C/f=3.4$) and fall night electrofishing ($C/f=11$) was below the minimum acceptable value (Table 3 and 4) for a quality fishery ($C/f=15$).

2. Smallmouth bass collected ranged from 102-107 and 160-205 mm in the spring and fall, respectively. These fish represented the 1993 stocking.
3. Although only fish from one of two year classes stocked were observed, the number and sizes collected indicated the odds for successfully establishing a brooder population are good.

Bluegill

1. Bluegill abundance from 1993 spring electrofishing (C/f=127) was above the minimum acceptable value for a quality forage supply. The total bluegill C/f has increased in recent sample years (Table 5).
2. In 1993 spring electrofishing, the abundance of bluegill < 75 and 75-149 mm was satisfactory, while those > 150 mm were only slightly below acceptable values (Figure 3). The abundance of bluegill 75-149 mm increased substantially in recent samples.
3. Body condition values (W_r) were unsatisfactory for all size groups. Condition values for all size groups have improved slightly in recent samples.
4. Bluegill abundance and size structure indicated they are providing a readily available source of prey for most sizes of predators.

Gizzard shad

1. Shad abundance from 1993 spring electrofishing (C/f=3.4) was extremely below the minimum acceptable value for a quality

forage supply (C/f=> 40). The total shad C/f has declined considerably in recent sample years (Table 6).

2. In spring electrofishing, the abundance of shad of all sizes were unsatisfactory; total abundance has declined substantially since 1980.
3. Body condition values were not calculated because of the small sample size.
4. Shad abundance and size structure indicated they were not providing an adequate source of prey. Poor annual recruitment appears to be the limiting factor.

RECOMMENDATIONS

Fish Attractor Structures

1. Fish attractors, constructed with cedar trees in 1993, should be refurbished in 1994.

Fish Stockings

1. Smallmouth bass fingerlings should be stocked at rate of 25 fish per hectare in 1994 to complete the three year introduction plan.

Fish Surveys

1. Fall night electrofishing should be conducted in 1994 to evaluate the success of 1992-94 smallmouth bass stockings.

Fishing Regulations

1. The City of Fairfax is encouraged to enforce the previously recommended 330 to 406 mm slot length limit on largemouth

bass. Past voluntary angler compliance with the slot limit has resulted in a desirable shift in the bass production structure from a sub-quality stockpiled situation to a quality fishery.

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Table 1. Species, number and size of fish stocked in Fairfax Lake, September, 1986-1993.

DATE	SPECIES	NUMBER	SIZE
1986	Channel Catfish	2,106	Fingerlings
1988	Channel Catfish	2,100	Fingerlings
1990	Channel Catfish	2,136	Growouts
1992	Smallmouth Bass	2,600	4.5" Finger
1993	Smallmouth Bass	1,040	2" Finger

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 Fairfax. Numbers in parentheses represent acceptable C/f values for a quality fishery. Acceptable W_r values are ≥ 90 .

Year	Total ¹ (≥ 40)		<200 mm ¹ (15-45)		200-299 mm ¹ (15-30)		≥ 300 mm ¹ (≥ 15)		≥ 356 mm ¹ (≥ 10)	
	No.	C/f	C/f	W_r	C/f	W_r	C/f	W_r	C/f	W_r
1980	131	43.7	6.0	89	32.0	89	5.7	98	3.7	100
1993	104	118.2	17.0	96	33.0	83	68.2	85	28.4	87

¹ Spring electrofishing

Table 3. Total number (No.), catch rates (C/f), and relative weights (W_r) by size groups of smallmouth bass collected by spring electrofishing from Lake Fairfax. Numbers in parentheses represent acceptable C/f values for a quality fishery. Acceptable W_r values are ≥ 90 .

Year	Total (≥ 15)		<200 mm -		200-299 mm -		≥ 300 mm -		≥ 356 mm (≥ 2)	
	No.	C/f	C/f	W_r	C/f	W_r	C/f	W_r	C/f	W_r
1993	3	3.4	3.4							

Table 4. Total number (No.), catch rates (C/f), and relative weights (W_r) by size groups of smallmouth bass collected by fall night electrofishing from Fairfax Lake. Numbers in parentheses represent acceptable C/f values for a quality fishery. Acceptable W_r values are ≥ 90 .

Year	Total (≥ 15)		<200 mm -		200-299 mm -		≥ 300 mm -		≥ 356 mm (≥ 2)	
	No.	C/f	C/f	W_r	C/f	W_r	C/f	W_r	C/f	W_r
1993	11	11	9	87	2					

Table 5. Total number (No.), catch rates (C/f), and relative weights (W_r) by size groups of bluegill collected by spring electrofishing and seining from Lake Fairfax. Numbers in parentheses represent acceptable C/f values for a quality fishery. Acceptable W_r values are ≥ 90 .

Year	Total ¹ (≥ 45)		<75 mm ¹ (≥ 10)		75-149 mm ¹ (20-100)		≥ 150 mm ¹ (≥ 15)		<100 mm ² -	
	No.	C/f	C/f	W_r	C/f	W_r	C/f	W_r	No.	C/f
1980	109	36.3	10.3		20.0	84	16.5	85		
1993	112	127.3	14.8		98.9	87	13.6	87		

¹ Spring electrofishing

² Seining

Table 6. 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 Lake Fairfax. Numbers in parentheses represent acceptable C/f values for a quality fishery. Acceptable W_r values are ≥ 90 .

Year	Total ¹ (≥ 40)		<200 mm ¹ (≥ 20)		Total ² ($\geq .20$)		>200 mm ² ($\geq .10$)		Age 0 ³ -	
	No.	C/f	C/f	W_r	C/f	W_r	C/f	W_r	No.	C/f
1980	58	21.1	4.7	73						
1993	3	3.4	---	--						

¹ Spring electrofishing

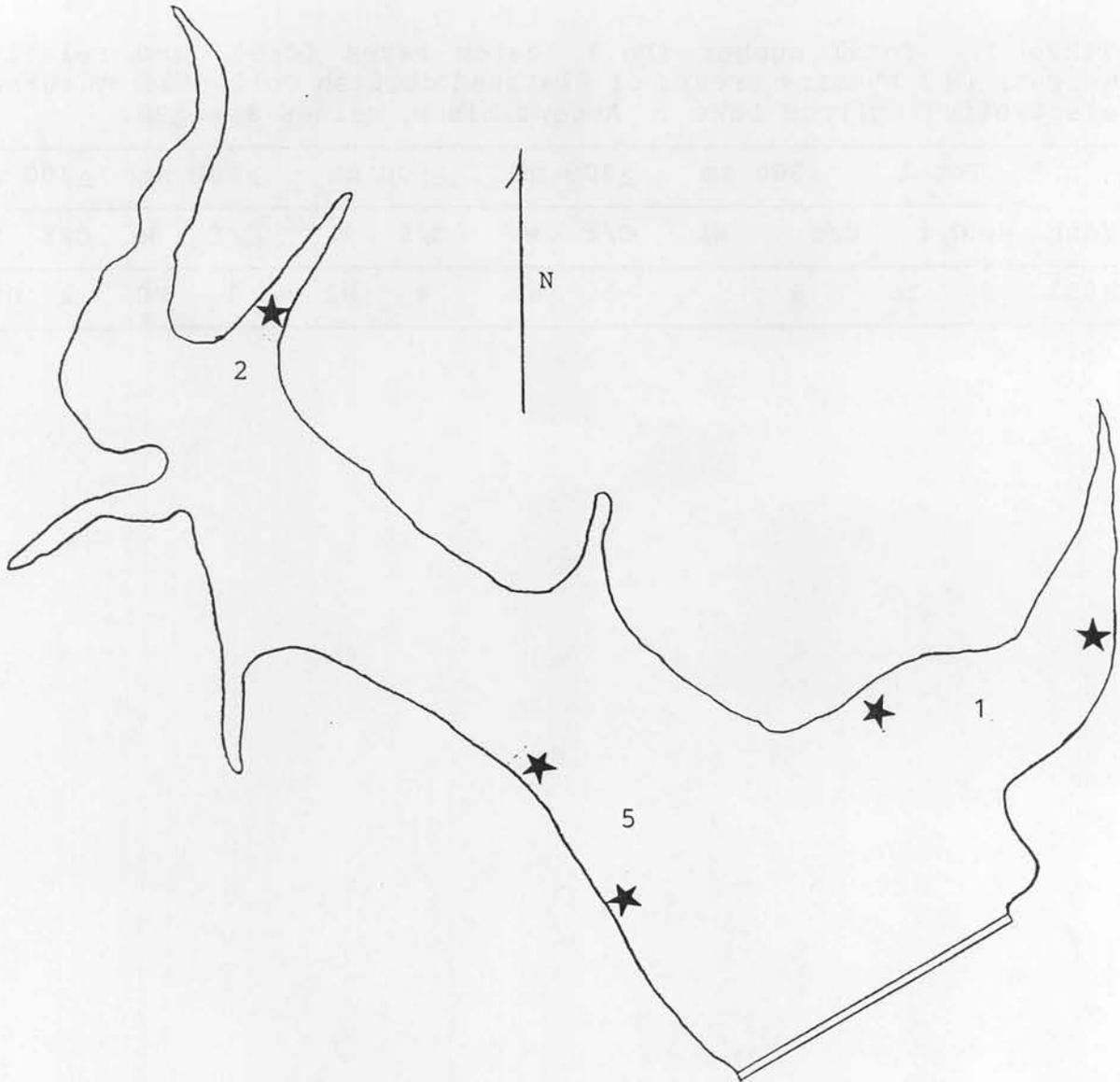
Table 7. Total number (No.), catch rates (C/f), and relative weights (W_r) by size groups of flathead catfish collected by summer electrofishing from Lake . Acceptable W_r values are ≥ 90 .

Year	Total		<300 mm		≥ 300 mm		≥ 500 mm		≥ 600 mm		≥ 700 mm	
	No.	C/f	C/f	W_r	C/f	W_r	C/f	W_r	C/f	W_r	C/f	W_r
1993	8	16	6		5	88	4	92	3	90	2	89



Figure 1.

FAIRFAX LAKE



LEGEND

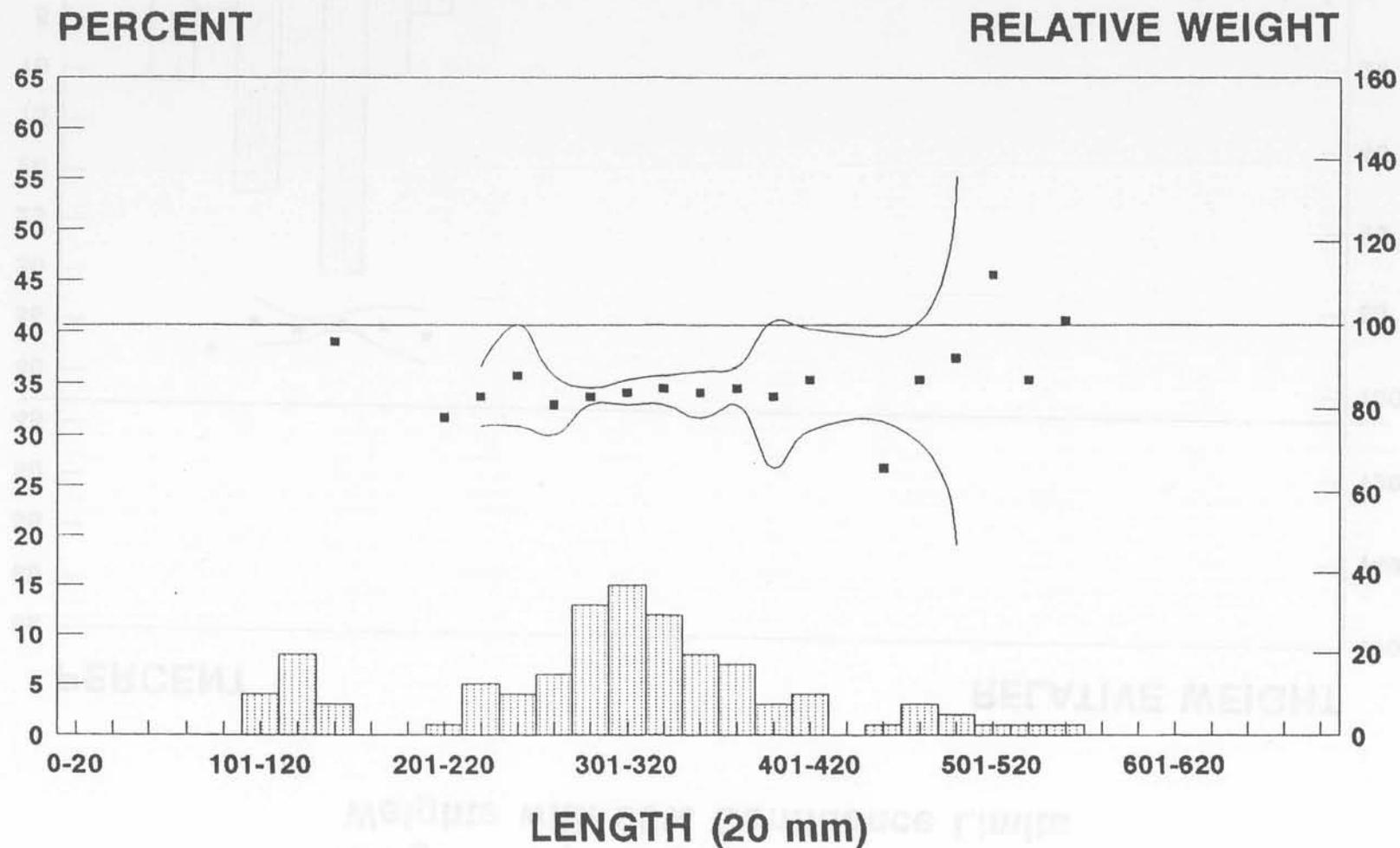
★ = SPRING ELECTROFISHING STATIONS

SCALE
½ MILE



FIGURE 2.

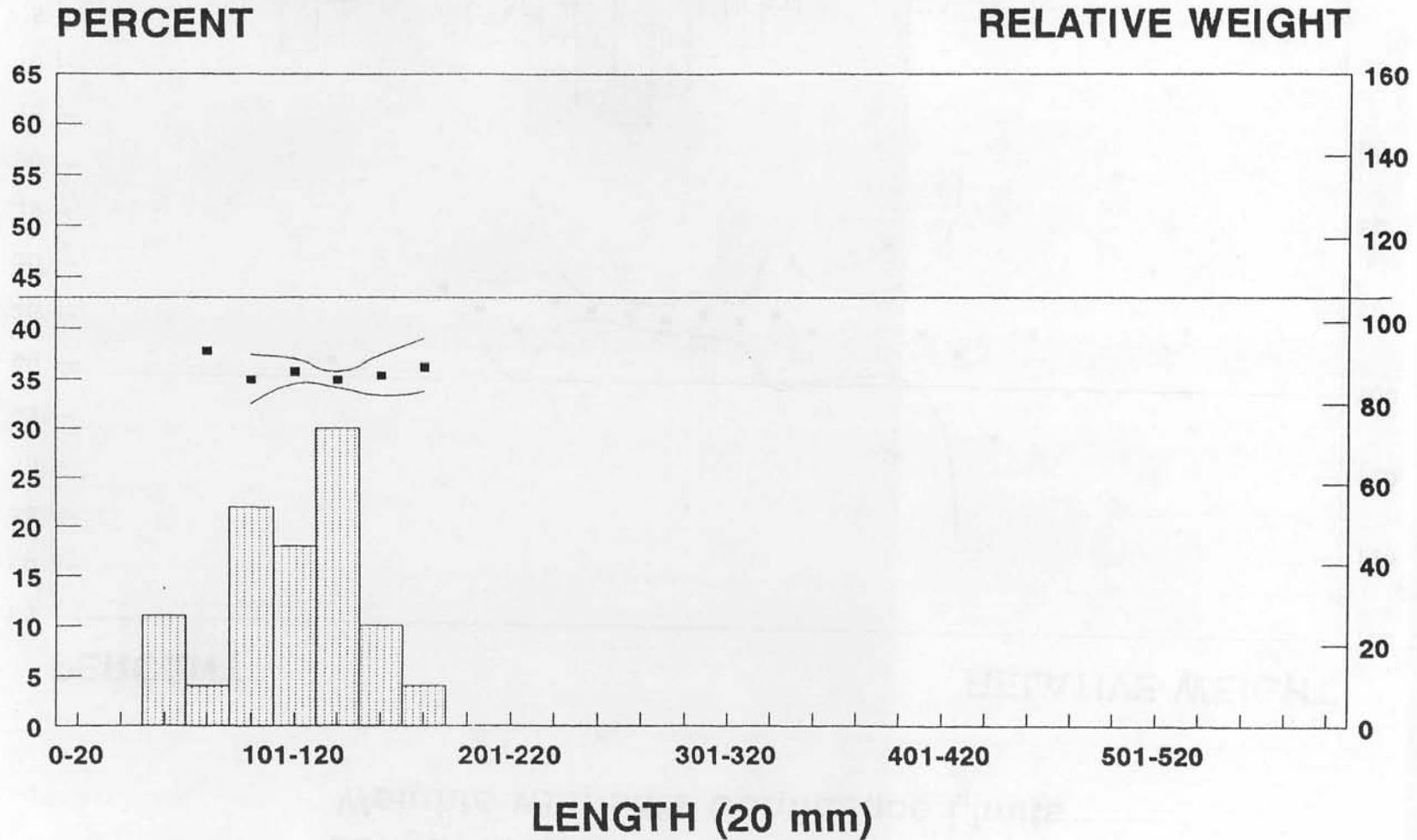
Length Frequency and Mean Relative Weights with 95% Confidence Limits



**1993 - Fairfax Lake
Largemouth Bass - N=104
Spring Electrofishing**

FIGURE 3.

Length Frequency and Mean Relative Weights with 95% Confidence Limits



**1993 - Farifax Lake
Bluegill - N=112
Spring Electrofishing**