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SURVEY REPORT

OKLAHOMA FISHERIES MANAGEMENT PROGRAM

FISH MANAGEMENT SURVEY AND RECOMMENDATIONS

FOR

LAKE ELLSWORTH

1992

Job Performance Report

Oklahoma Fisheries Management Program

Federal Aid Project No. F 44-D-5

Fish Management Survey and Recommendations

for

LAKE ELLSWORTH

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INTRODUCTION

Lake Ellsworth impounds East Cache Creek, 15 km north of Lawton in Comanche County, Oklahoma (Fig. 1). The lake covers 2240 surface hectares and was constructed in 1962 by the City of Lawton. Ellsworth has a mean depth of 5 m and a maximum of 18 m, a water exchange rate of 0.5, and a secchi disc visibility of around 55 cm in the main pool in August; turbidity is primarily from suspended clay. Fish habitat consists of natural rock outcrops at the south end, flooded timber in the major coves, and rip-rap at the dam and on railroad bridges. Important fisheries are for crappie, blue catfish, and recently for saugeye. Fishing pressure potential is high from Lawton/Ft. Sill and surrounding communities.

Lake Ellsworth's fishery boomed after construction in 1962, and again in the 1970's after a dam extension. Turbidity from exposed clay banks and an agricultural watershed, combined with the loss of cover caused a considerable decline in fishing for most species in the 1980's. Lake level fluctuations from evaporation and water use by the City of Lawton causes problems with fish reproduction and recruitment.

Saugeye have been stocked since 1988 to supplement the pelagic fishery at Ellsworth. Previous attempts to introduce walleye and hybrid striped bass produced only marginal populations. Channel catfish were stocked in 1990-92 in an attempt to boost recruitment (Table 1). Several fish attractors have been built, primarily in the southern half of the lake.

Spotted Bass

1. The spotted bass catch rate from 1992 spring electrofishing was 14.4. The total spotted bass C/f increased considerably since 1986 (Table 3).
2. The catch rates for spotted bass increased for all size groups from the 1986 sample.
3. Body condition values were satisfactory for all size groups. Condition values for 200-299 mm spotted bass fell slightly since 1986.
4. The increase in spotted bass numbers may be due to spending more sampling effort in their habitat (Chandler Creek arm) in 1992 than in 1986.

Crappie [combined]

1. Crappie abundance from 1992 fall gillnetting (C/f=0.17) was near the minimum acceptable value for a quality fishery. The total crappie C/f has declined in recent sample years (Table 4).
2. Catch rates of crappie in all size groups were satisfactory. However, the abundance of crappie below 200mm declined by 70 percent from recent samples.
3. Body condition values were satisfactory for all size groups. However, condition values for all size groups declined from the 1989 sample.
4. Abundance of young crappie is sporadic at Ellsworth, but condition values are adequate. These factors indicate that recruitment may limit the fishery, and Ellsworth anglers may benefit from a minimum length limit on crappie.

Saugeye

1. Saugeye abundance from 1992 fall gillnetting (C/f=0.10) was comparable to the minimum acceptable value for a quality fishery. The saugeye catch from fall-night electrofishing (C/f=34.0) was well above the minimum acceptable value for a quality fishery. The total saugeye C/f has increased in recent sample years (Table 8).
2. The catch rates of saugeye in small (<300 mm) and large (>400 mm) size groups were satisfactory, while numbers in the 300-399 mm range were below the acceptable value for both gears. The abundance of small saugeye increased, while intermediates declined in recent samples.
3. Body condition values were satisfactory for all size groups. Conditions for small saugeye declined from previous samples.
4. After three years of poor recruitment, Ellsworth's saugeye population boomed in 1992. The improvement was probably a result of abundant shad. Recent high water allowed many saugeye to leave the lake, but fishing was good below the dam in 1992.

Channel catfish

1. Channel catfish abundance from 1992 gillnetting (C/f=0.05) was well below the minimum acceptable value for a quality fishery (C/f=0.20). The total channel catfish C/f has been stable in recent sample years (Table 9).
2. Catch rates of channel catfish in all size groups were below acceptable values. The catch rates of channel catfish in all size groups were stable in recent samples.

2. The abundance of <300 mm flathead catfish was stable in recent samples, but abundance declined for larger fish.
3. Body condition values were satisfactory for small flatheads, and those over 300 mm were in excellent condition. Condition values for large flatheads improved in recent samples.
4. Ellsworth's flathead population was the best found in Southwest Oklahoma, but optimal catch rates have not been determined. The decrease in abundance of large flatheads in 1992 may have been caused by sampling gear changes.

Bluegill

1. Bluegill abundance from 1992 spring electrofishing (C/f=109) was well above the minimum acceptable value. The total bluegill C/f increased from 1986 (Table 13).
2. The catch rates of bluegill <75 mm and 75-149 mm were above satisfactory, indicating a quality forage supply. The abundance of >75 mm bluegill increased greatly from 1986.
3. Body conditions were satisfactory for all bluegill sizes. Conditions for large bluegill declined from the 1986 sample.
4. The increased abundance of bluegill in the sample may have been a result of sampling bias, but recent high water conditions have been conducive to bluegill recruitment.

Gizzard Shad

1. Shad abundance from 1992 spring electrofishing (C/f=51) was comparable to the minimum acceptable value (C/f= 40). Shad abundance from 1992 fall gillnetting (C/f=0.44) was above the minimum acceptable value (C/f= 0.2). The total shad C/f has been sporadic in recent sample years (Table 14).

RECOMMENDATIONS

Habitat Enhancement

1. A three-year drawdown would benefit Lake Ellsworth by stimulating long-term fish recruitment, particularly for bass and crappie. If possible, the shoreline should be exposed to the 1230 ft level (5 ft below normal) by pumping water to Lake Lawtonka for two summers. Natural drawdown effects caused by evaporation and drought may prolong the drawdown, but effects of the program would only be extended and improved. Anglers and bait businesses would realize an initial boom in fishing, followed by a 2-3 year slow fishing period. This sacrifice would yield significant, long-term fishing benefits, lasting an estimated 7-10 years.
2. In leiu of the above plan, a water conservation plan should be implemented by the City of Lawton to reduce lake level fluctuations at Lake Ellsworth, thereby maintaining forage and predator numbers.

Fish Attractor Structures

1. All existing structures should be refurbished by 1996.

Fish Stockings

1. Saugeye fingerlings should be stocked annually (25/ha-56,000) to maintain the fishery.
2. Channel catfish stockings should be discontinued since they were ineffective at increasing abundance.
3. Hybrid striped bass fry should be stocked occasionally (250/ha-560,000), if hatchery surplus is available, to provide a trophy fishery.

Table 1. Species, number and size of fish stocked in Lake Ellsworth, 1980-1992.

DATE	SPECIES	NUMBER	SIZE
1980	Largemouth Bass	81,405	Fingerlings
1980	White crappie	3,600	Fingerlings
1981	Walleye	380,500	Fry
1982	Walleye	560,000	Fry
1982	Hybrid S Bass	502,962	Fry
1983	Hybrid S. Bass	400,000	Fry
1984	Walleye	560,000	Fry
1984	Hybrid S. Bass	448,000	Fry
1985	Hybrid S. Bass	28,000	Fingerlings
1985	Florida LMB	56,925	Fingerlings
1986	Florida LMB	56,056	Fingerlings
1986	Hybrid S. Bass	53,990	Fingerlings
1986	Channel catfish	43,400	Fingerlings
1987	Largemouth bass	20,075	Fingerlings
1987	Florida LMB	35,975	Fingerlings
1987	Hybrid S. Bass	98,600	Fingerlings
1988	Saugeye	48,411	Fingerlings
1988	Hybrid S. Bass	56,034	Fingerlings
1988	Florida LMB	10,075	Fingerlings
1988	Channel catfish	51,100	Fingerlings
1989	Saugeye	112,000	Fingerlings
1990	Channel catfish	26,595	Fingerlings
1990	Saugeye	118,000	Fingerlings
1990	Northern LMB	30,000	Fingerlings
1990	Intergrade FLMB	18,250	Fingerlings
1991	Channel catfish	74,000	Fingerlings
1991	Saugeye	56,450	Fingerlings
1991	Bluegill	212,000	Fingerlings
1992	Channel catfish	78,000	Fingerlings
1992	Saugeye	56,100	Fingerlings

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

	Total (≥.20)		<200 mm (.05-.30)		≥200 mm (≥.08)		≥250 mm (≥.04)	
Year	No.	C/f	C/f	W	C/f	W_r	C/f	W_r
1977	270	1.21						
1981	60	0.25						
1983	29	0.13						
1984	73	0.32						
1986	21	0.08	0.06	98	0.02	112	0.01	116
1987	36	0.15	0.08	104	0.06	107	0.03	115
1988	107	0.43	0.34	100	0.09	103	0.02	110
1989	95	0.37	0.34	99	0.03	106	0.01	104
1992	40	0.17	0.09	95	0.08	97	0.03	91

Table 5. Total number (No.), catch rates (C/f), and relative weights (W_r) by size groups of **white bass** collected by gill netting from Lake Ellsworth. Numbers in parentheses represent acceptable C/f values for a quality fishery. Acceptable W_r values are ≥90.

	Total (≥.20)		<200 mm (≥.05)		200-299 mm (.05-.30)		≥300 mm (≥.10)	
Year	No.	C/f	C/f	W	C/f	W_r	C/f	W_r
1977	14	0.06						
1981	13	0.05						
1983	1	-						
1984	34	0.15						
1986	5	0.02	-	82	0.01	94	0.01	96
1987	0	-						
1988	13	0.05	0.01	106	0.02	94	0.02	94
1989	8	0.03	0.02	88	0.01	92	0	-
1992	56	0.24	0.12	97	0.07	84	0.06	96

Table 8. Total number (No.), catch rates (C/f), and relative weights (W_r) by size groups of **saugeye** collected by gill netting from Lake Ellsworth. Numbers in parentheses represent acceptable C/f values for a quality fishery. Acceptable W_r values are ≥ 90.

	Total (>.10)		<300 mm (≥.06)		300-399 mm (≥.02)		≥400 mm (≥.02)	
Year	No.	C/f	C/f	W	C/f	W_r	C/f	W_r
1988*	1	-	<0.01	-				
1989	1	-	<0.01	-				
1992	22	0.10	0.05	95	0	-	0.04	95

* Saugeye were first stocked in Ellsworth in 1988.

Table 9. Total number (No.), catch rates (C/f), and relative weights (W_r) by size groups of **saugeye** collected by night electrofishing from Lake Ellsworth. Numbers in parentheses represent acceptable C/f values for a quality fishery. Acceptable W_r values are ≥ 90.

	Total (≥15)		<300 mm (≥10)		300-399 mm (≥3)		≥400 mm (≥2)	
Year	No.	C/f	C/f	W	C/f	W_r	C/f	W_r
1988* Gill netting conducted								
1989* Gill netting conducted								
1990	29	23.2	16.0	113	4.8	112	2.4	103
1991	13	10.4	1.6	112	1.6	94	7.2	96
1992	34	34.0	27.0	89	0	-	7.0	96

Table 12. Total number (No.), catch rates (C/f), and relative weights (W_r) by size groups of **flathead catfish** collected by gill netting from Lake Ellsworth. Acceptable W_r values are $\geq$90.

	Total		<300 mm		≥300 mm		≥500 mm		≥600 mm		≥700mm	
Year	No.	C/f	C/f	W_r	C/f	W_r	C/f	W_r	C/f	W_r	C/f	W_r
1977	7	0.03										
1981	12	0.05										
1983	20	0.09										
1984	6	0.03										
1986	10	0.04	0	-	0.04	107	0.04	107	0.04	107	<0.01	135
1987	4	0.02	0	-	0.02	104	0.02	104	0.01	104	0	-
1988	6	0.02	0	-	0.02	102	0.02	101	0.01	106	0	-
1989	4	0.02	0	-	0.02	106	0.01	108	<0.01	106	0	-
1992	9	0.04	0	-	0.04	115	0.03	126	0.02	131	0	-

Table 13. Total number (No.), catch rates (C/f), and relative weights (W_r) by size groups of **flathead catfish** collected by summer electrofishing from Lake Ellsworth. Acceptable W_r values are $\geq$90.

	Total		<300 mm		≥300 mm		≥500 mm		≥600 mm		≥700mm	
Year	No.	C/f	C/f	W_r	C/f	W_r	C/f	W_r	C/f	W_r	C/f	W_r
1991	131	65.5[1]	44.0	106	21.5	105	11.0	119	10.0	120	6.0	122
1992	119	59.5[2]	44.5	91	15.0	120	7.0	143	5.0	145	1.5	152

[1] C/f and Wr data are from stationary electrofishing in 1991.
[2] C/f and Wr data are weighted means from both stationary and moving electrofishing in 1992.

Table 16. Total number (No.) and catch rates (C/f) of non-game fish collected by gill netting from Lake Ellsworth.

	[1] CRP		[1] DRM		[1] RCS		[1]		[1]		Total	
Year	No.	C/f	No.	C/f	No.	C/f	No.	C/f	No.	C/f	No.	C/f
1977	44	0.20	44	0.20	101	0.45						
1981	10	0.04	16	0.07	41	0.17						
1983	3	0.01	0	-	12	0.05						
1984	16	0.07	13	0.06	38	0.16						
1986	9	0.03	8	0.03	17	0.06						
1987	23	0.10	33	0.14	10	0.04						
1988	9	0.04	38	0.15	26	0.10						
1989	7	0.03	33	0.13	22	0.09						
1992	16	0.07	6	0.03	64	0.29						

[1] 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.

Figure 1.

LAKE ELLSWORTH

OWNER—City of Lawton

YEAR OF CONSTRUCTION—1962

COUNTY—Comanche & Caddo

LOCATION OF DAM—Sec. 28-T4N-R11WIM

SHORELINE LENGTH—43 miles*

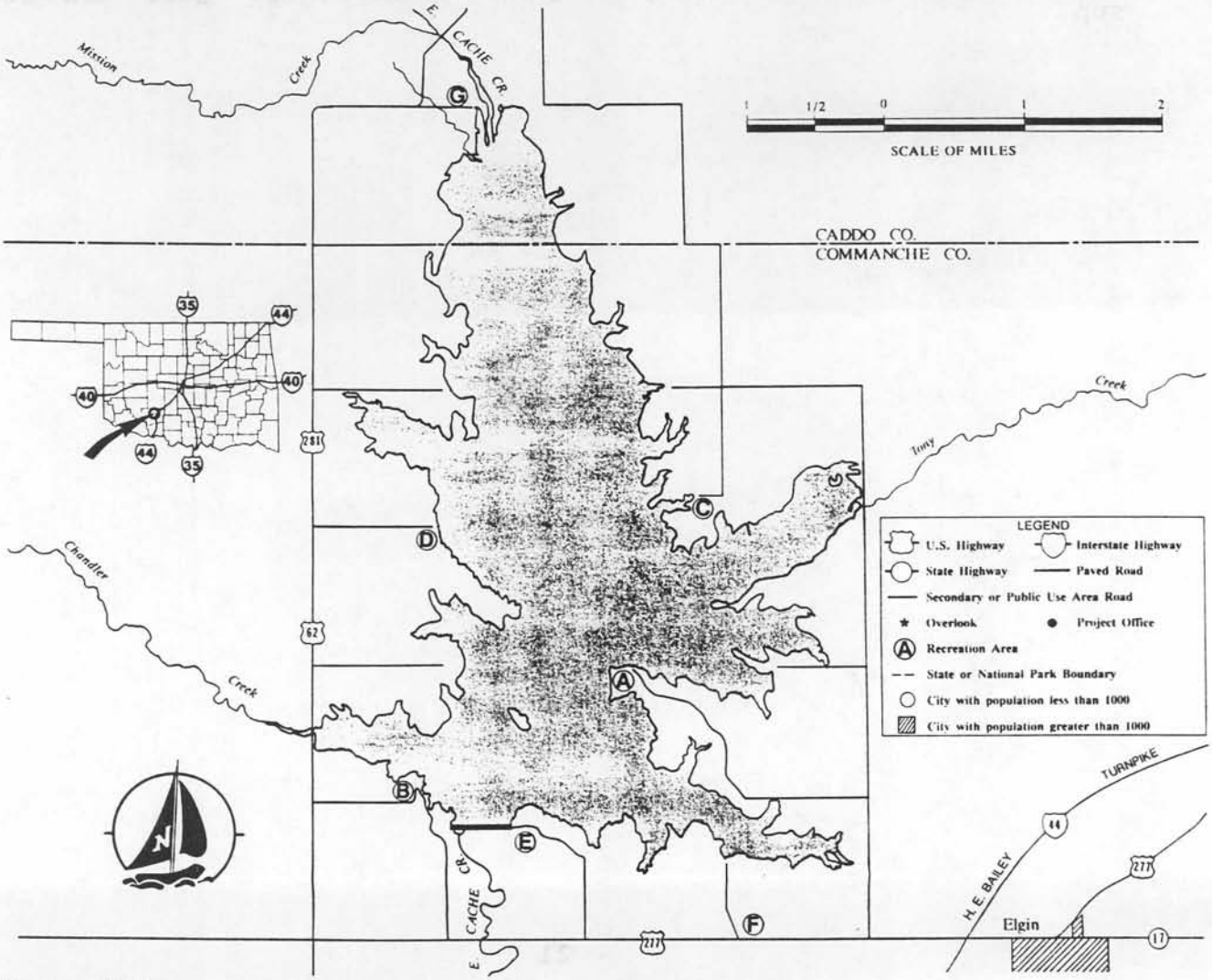
LAKE DATA—

	Elevation (NGVD)	Area (Acres)	Capacity (Acre-Feet)
Normal Pool	1,235	5,600	95,200

PURPOSE—Water supply & recreation

ADDITIONAL FACILITIES—[1]Marina; [2]Heated fishing dock & marina; [3]Motocross area

RECREATIONAL AREAS / FACILITIES	Boat Ramp	Boat Dock	Fishing Dock	Campsites	Camper Parking	Electrical Hookups	Picnic Area	Grills	Trash Receptacles	Restrooms	Playground	Group Shelter	Drinking Water	Concessions
A Fisherman's Cove[1]	●	●	●	●	●	●	●	●	●	●	●		●	●
B Ralph Resort[2]	●	●	●	●	●	●	●	●	●	●	●	●	●	●
C Collier Landing	●	●	●	●		●	●	●	●	●				
D Edgewater Park	●	●		●		●	●	●	●	●				
E Dam Camp Ground				●			●	●	●	●				
F R.V. Track[3]									●	●				
G North Side	●			●					●					



Mapping—Oklahoma Water Resources Board