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AN EVALUATION OF THE CO-OP LAKE FISHERY

by

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SK-48

British Columbia Ministry of Environment
Fisheries Branch
Smithers, B.C.

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INTRODUCTION

Co-op Lake is situated approximately 24 kilometers east of Burns Lake, B.C. It is a small lake of approximately 31 ha with a maximum depth of 10.3 m. The lake has good year round access, and supports both a winter (ice) and a summer fishery for stocked brook trout.

Previous work on Co-op Lake include lake surveys Fish and Wildlife staff in 1968 and in 1977 and a casual winter creel in 1982. These data are on file with Fisheries Branch, Smithers.

The Co-op Lake sport Fisheries is one of the most heavily utilized in the Burns Lake area. The lake has been stocked with brook trout since 1963 (Table 1). In the past fish up to 3.6 kg have been reported. Recently it has been noted that larger fish are no longer being harvested (Del Parker, pers. comm.). In June 1984 a Fisheries crew went to Co-op Lake to investigate the reported lack of larger fish.

Table 1. Stocking history of Co-op Lake.

Date	No. of brook trout planted	Size (No/Kg)
1963	10,000	970
1965	8,000	450
1967	10,000	194
1968	25,000	1100
1970	20,000	1100
1974	3,500	154
1976	20,000	640
1978	20,000	308
1981	20,000	430
1982	20,000	529
1983	20,000	400
1984	5,000	272

METHODS

The fisheries crew sampled the fish in the lake by angling and setting an overnight, variable-mesh gillnet. Most fish angled were released and the netted fish were measured, weighed, sexed, and some scale samples were taken. Data was then compiled and compared with previous data.

RESULTS AND OBSERVATIONS

The total number of fish sampled was 87 with approximately 60 others being angled and released. None of the fish captured were large (maximum length 35.5 cm) (Appendix 1). When lengths and weights were compared with previous data, it was shown that the average size of the 1984 sample was similar to that of the 1977 sample, but both were significantly less than the 1968 sample (Table 2).

Table 2. Comparison of size of fish collected from Co-op Lake in 1968, 1977 and 1984.

	1968 (n=50)	1977 (n=244)	1984 (n=87)
Ave. length (cm)	30.0	24.2	24.9
Ave. Weight (g)	470	238	295
Ave. length (cm)	41.5	47.0	35.5

The male to female ratio was similar for all three years: 1:1.5 in 1968, 1:1.4 in 1977 and 1:1.3 in 1984.

The age composition of the 1984 sample shows that there are very few older fish in the population (Table 3).

Table 3. Age composition of fish sampled in Co-op Lake in 1984 (extrapolated over total sample n=87).

Age	Number	Percent
0 ⁺	17	20
1 ⁺	45	52
2 ⁺	23	26
3 ⁺	<u>2</u>	<u>2</u>
	87	100

The stomach contents consisted of snails, aquatic insects including mosquito larvae, and blood worms. Fair amounts of fat were observed in the abdominal cavities of all fish samples.

DISCUSSION

The fish in Co-op Lake all seem to be healthy. The average size has not changed much from the 1977 sample. However the maximum length has decreased. This and the fact that the older age classes (4+ and older) are not present indicates that the fish are being harvested at an early age before they can attain larger size ranges. The age composition seems to be skewed with fewer 0+ present than 1+ and 2+ but this could be attributed to the fact that fewer fish were planted in 1984 than the previous years, or that the net was more selective in catching larger fish.

The management of this lake is directed towards providing a sport fishery where the angler has a good chance of catching pan sized fish and not a trophy fishery. The fish that are being produced in Co-op at the time of this study are still meeting the management objectives.

It appears that the actual stocking rate could be greater than the calculated stocking rate (10,000 @ 440/kg) because the fish appear to be experiencing heavy exploitation.

RECOMMENDATION

1. Provide a higher level of stocking than stated by stocking calculations (approximately 50% higher i.e. 15,000 @ 440/kg).
2. Do an intensive creel census to determine exploitation rates for winter and summer fisheries.
3. Continue to monitor fish size and ages periodically (i.e. every four years) to determine the effects of the higher stocking rate and to ensure our management objectives are maintained.

APPENDIX 1

Lake: Co-op LakeSurvey Date: June 27/84

* = Scale sample

Fish No.	Species	Length		Weight		Sex	Comments
		cm.	in.	g.	oz.		
1	EBT	27.3				F	
2	EBT	26.8				M	
3	EBT	30.3				F	
4	EBT	27.7				M	
5	EBT	33.5				M	
6	EBT	31.0				F	
7	EBT	29.8				F	
8	EBT	12.0		24		-	*
9	EBT	12.0				-	
10	EBT	10.9				-	*
11	EBT	9.5		15		-	*
12	EBT	10.5		16		-	*
13	EBT	10.0				-	
14	EBT	11.1				-	
15	EBT	11.2				-	
16	EBT	10.1				-	
17	EBT	11.2				-	
18	EBT	10.7				-	
19	EBT	11.8				-	
20	EBT	11.1				-	
21	EBT	10.6				-	
22	EBT	10.0				-	
23	EBT	10.4				-	
24	EBT	9.3				-	
25	EBT	26.2		310		F	*

Lake: Co-op Lake

Survey Date: June 28/84

* = Scale sample

Fish No.	Species	Length		Weight		Sex	Comments
		cm.	in.	g.	oz.		
26	EBT	27.5		280		F	*
27	EBT	33.0		425		F	*
28	EBT	20.6		110		F	*
29	EBT	25.5		220		M	*
30	EBT	26.1		270		F	*
31	EBT	27.0		290		M	*
32	EBT	27.3		280		M	*
33	EBT	25.9		260		M	*
34	EBT	27.6		330		M	
35	EBT	25.4		240		F	
36	EBT	29.8		325		F	*
37	EBT	24.8		215		F	*
38	EBT	25.9		245		F	
39	EBT	33.0		435		F	
40	EBT	25.3		245		F	
41	EBT	25.7		225		F	*
42	EBT	22.8		155		M	*
43	EBT	35.0		575		M	*
44	EBT	26.9		290		F	
45	EBT	30.2		340		F	*
46	EBT	30.7		385		F	*
47	EBT	30.2		405		F	
48	EBT	34.0		450		F	*
49	EBT	30.5		380		M	
50	EBT	33.0		455		F	
51	EBT	26.1		270		M	
52	EBT	31.0		390		F	*
53	EBT	34.5		470		F	*
54	EBT	25.5		250		F	
55	EBT	26.2		250		M	
56	EBT	32.5		355		F	*
57	EBT	35.5		500		F	*
58	EBT	25.5		245		M	
59	EBT	25.2		235		F	
60	EBT	27.0		275		M	
61	EBT	30.9		395		M	*
62	EBT	32.5		425		F	
63	EBT	28.3		330		M	
64	EBT	22.9		170		M	
65	EBT	25.9		240		M	
66	EBT	25.6		245		M	
67	EBT	21.2		135		M	*

Lake: Co-op Lake

Survey Date: June 27/84

* = Scale sample

Fish No.	Species	Length		Weight		Sex	Comments
		cm.	in.	g.	oz.		
68	EBT	31.0		430		F	
69	EBT	29.8		340		M	
70	EBT	20.5		110		M	
71	EBT	22.5		175		F	
72	EBT	27.1		285		F	
73	EBT	25.6		260		M	
74	EBT	25.3		255		M	
75	EBT	25.4		230		M	
76	EBT	26.0		255		F	
77	EBT	26.0		280		F	
78	EBT	33.5		410		F	
79	EBT	33.0		445		M	
80	EBT	20.5		125		F	
81	EBT	25.2		250		F	
82	EBT	31.5		430		F	
83	EBT	33.0		465		F	
84	EBT	34.0		500		M	
85	EBT	26.0		290		M	
86	EBT	30.0		340		M	
87	EBT	24.7		205		F	

N = 87

Ave. length = 24.9 cm.

Ave. weight = 295 g.

M:F = 1:1.3

Fish all look fat and healthy - H₂O temp. 16°C.

Set 1 gill net over night and angled during day - caught approximately 60 fish angling - releasing most of them. Used fish caught in the net for samples. Fish had snails, bugs, blood worm and mosquito larvae in stomach.

APPENDIX 2

Lake: Co-op Lake

Survey Date: June 28/84

Scale interpreter: First: David Bustard Second: George Schultze

Fish No.	Species	Length		Weight		Sex	Comments	Age
		cm.	In.	g.	oz.			
1	EBT	9.5		15				0 ⁺
2	EBT	10.5		16				0 ⁺
3	EBT	10.9						0 ⁺
4	EBT	12.0		24				0 ⁺
5	EBT	20.6		110		F		1 ⁺
6	EBT	21.6		135		M		1 ⁺
7	EBT	22.6		155		M		1 ⁺
8	EBT	24.8		215		F		1 ⁺
9	EBT	25.9		260		M		1 ⁺
10	EBT	25.5		260		M		1 ⁺
11	EBT	25.7		225		F		1 ⁺
12	EBT	26.1		270		F		1 ⁺
13	EBT	26.2		310		F		1 ⁺
14	EBT	26.8				M		1 ⁺
15	EBT	27.0		290		M		1 ⁺
16	EBT	27.2				F	Snails & insect	1 ⁺
17	EBT	27.3		280		M		1 ⁺
18	EBT	27.5		280		F		1 ⁺
19	EBT	27.7				M		1 ⁺
20	EBT	29.8		325		F		1 ⁺
21	EBT	29.8				F		1 ⁺
22	EBT	30.2		340		F		1 ⁺
23	EBT	30.3				F	Bugs	2 ⁺
24	EBT	30.7		385		F		1 ⁺
25	EBT	31.0				F		1 ⁺

* These fish were planted in spring. It has been assumed first annulus occurs quite far out from the center - first winter in hatchery is not counted as a year in aging.

** Annuli are not very distinct on these fish.

Lake: Co-op Lake

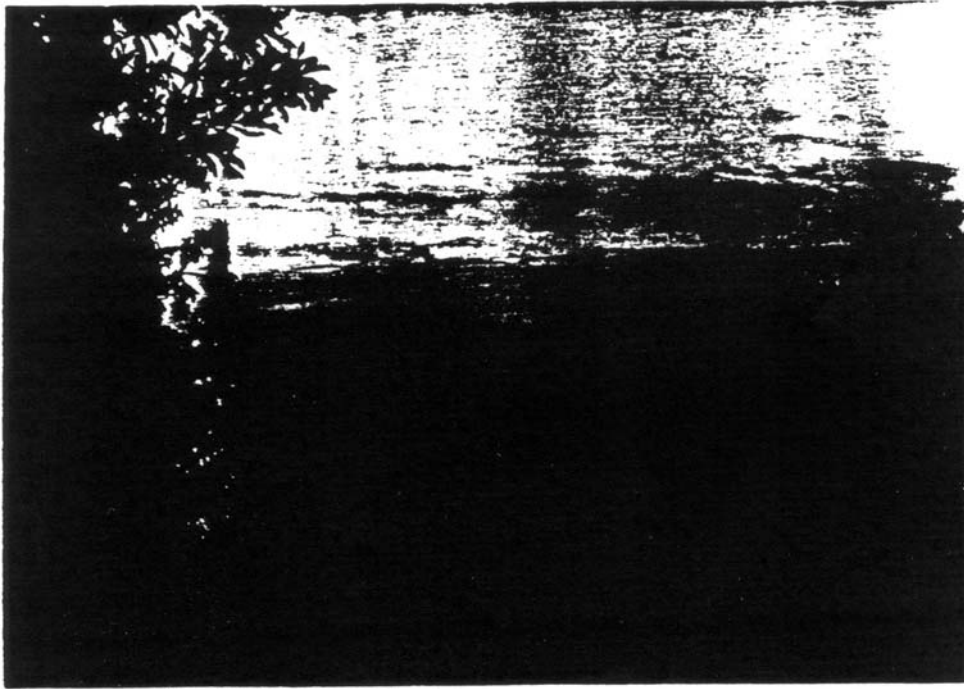
Survey date: June 28/84

Scale interpreter: First: David Bustard Second: George Schultze

Fish No.	Species	Length		Weight		Sex	Comments	Age
		cm.	In.	g.	Oz.			
26	EBT	31.0		390		F		2 ⁺
27	EBT	32.5		425		F		2 ⁺
28	EBT	32.5		355		F		2 ⁺
29	EBT	33.0		425		F		2 ⁺
30	EBT	33.5				M	blood worm/ mosquito larvae	2 ⁺
31	EBT	34.0		450		F		2 ⁺
32	EBT	34.5		470		F		2 ⁺
33	EBT	35.0		575		M		3 ⁺
34	EBT	35.5		500		F		3 ⁺

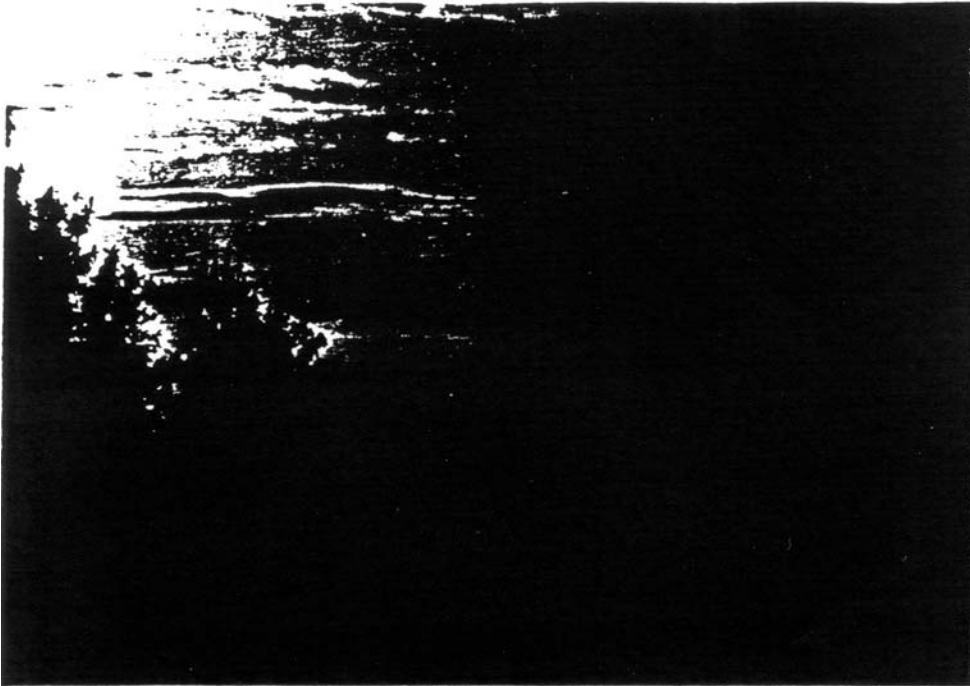
N = 34

Ave. weight = 247

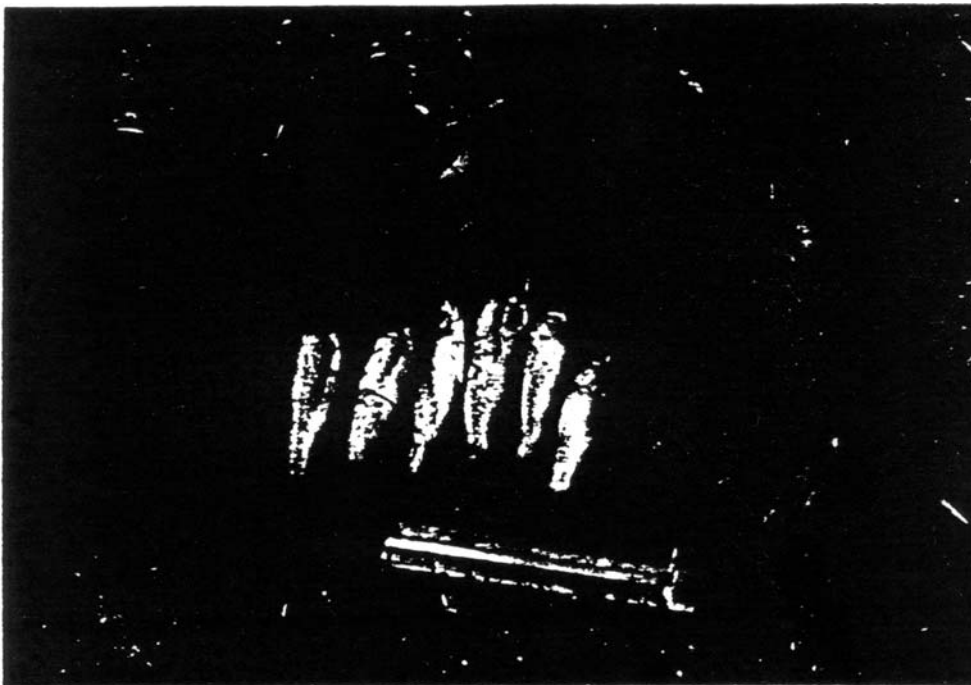


Co-op Lake

APPENDIX 3



Co-op Lake



Co-op Lake
Brook trout