



Bag 5000, Smithers, British Columbia V0J 2N0

To: File

SC734

Date: Jun 21, 1990

File: Lakelse Lake

Re: MILAP Creel Census, Lakelse Lake, 1986

The following material describes a creel survey conducted during April-October, 1986 on Lakelse Lake as part of a Canada Employment and Immigration sponsored employment opportunity program (Modified Industrial Labour Adjustment Program or "MILAP"). The objective of the study was to supplement baseline data and determine levels of effort and catch in this fishery.

Although a fairly comprehensive analysis and write-up was attempted, the survey design and quality of data were inadequate to warrant more than an elaborate file note. The attached material should be therefore viewed with caution, particularly in terms of extrapolations leading to estimates of total catch and effort. Even the catch per hour data should be viewed with discretion as it appears to have been generated largely from interviews with anglers who had either just arrived at the lake or had just started fishing.

The majority of the report was compiled by Dionys deLeeuw, while I was involved in the generation of estimates and incorporated editorial comments into the final draft.

Happy reading!

C.R. Spence, R.P.Bio.
Senior Fisheries Biologist
Recreational Fisheries Branch

1974
Fishes

THE EFFECT OF QUANTITATIVE LABELING (1974)

The following material describes a brief survey of the fishery during April-October 1974 on Lake Erie as part of a broader Employment and Unemployment Research Program (EUREP) funded by the Industrial Labour Relations Board of the University of Michigan. The objective of the study was to supplement existing data on declining levels of effort and catch in this fishery.

Although a fairly comprehensive analysis had been attempted, the amount and quality of data were inadequate to permit more than an exploratory study. The statistical methods employed were viewed with caution. Extrapolations from the data given were made leading to estimates of total effort and catch. The data for effort should be viewed with caution with a note that they have been derived largely from interviews with fishers who had either just arrived at the lake or had just departed.

The majority of the report was compiled by Brooks and White. I was involved in the preparation of sections and incorporated editorial comments into the final draft.

Happy fishing!

G. M. Spencer, R. B. Rio,
Senior Fisheries Biologist
Regional Fisheries Council

INTRODUCTION

Lakelse Lake, in west-central British Columbia near the community of Terrace, supports one of the most popular cutthroat trout (*Oncorhynchus clarki*) fisheries in the Skeena River drainage. Physical aspects of the system have been described in considerable detail (Sinclair 1979; McKean 1986; Warrington 1986) and studies of its sport fishery have been undertaken periodically over the past 30 years (Bilton and Shepard 1955; Imbleau 1979; Hatlevik et al 1981).

The following reports describes a creel survey conducted during April - October, 1986. The project was sponsored by a Canada Employment and Immigration employment opportunity program (Modified Industrial Labour Adjustment Program or "MILAP"). The objective was to supplement baseline data and to determine levels of effort and catch in this fishery.

METHODS

Anglers were interviewed on 46 weekdays and 30 weekend days randomly selected from April 2 to October 13, 1986. Only 39.2% of the 194 available days were sampled.

During sample days, interviews were obtained over the full period of daylight for all shore and boating anglers. Information recorded included the date and time of the interview, number of anglers per boat or shore party, number of rods actually fishing, angler residence, hours fished prior to interview, expected length of trip, species sought, gear used and catch (Appendix I).

Effort and catch were estimated from sample data by partitioning the survey into weekday and weekend strata within each month and extrapolating. Estimates of effort for each stratum were established by determining the average daily effort for that stratum and multiplying that average by the total number of days within the

stratum. The length of an angler day was estimated by dividing the sum of all expected trip lengths by the number of trips.

Catches for each species were determined by calculating the average catch per unit effort within each stratum, and then multiplying that figure by the estimate of total effort. Effort and catch estimates for each stratum were then totalled to provide monthly estimates. These were further totalled to determine effort and catch estimates for the entire survey period.

RESULTS AND DISCUSSION

SAMPLED EFFORT AND SUCCESS

A total of 289 angling parties were interviewed, comprising 486 anglers of which 441 were fishing (Appendix II). Angling time accumulated prior to interviews totalled only 560 hr, indicating most anglers were interviewed very near the beginning of their trip.

Cutthroat trout dominated the catch (Table 1). The largest number of cutthroat were taken with flies, followed by hardware in combination with bait and finally hardware alone. Dolly Varden, rainbow, whitefish and squawfish comprised only 9% of the reported catch.

Success rates varied from 0.32 to 0.86 fish per hr for cutthroat trout, depending on gear type (Table 2). The average catch rate for cutthroat trout was 0.68 fish per hr, the second lowest recorded in Lakelse Lake (Table 3). This is likely in part a reflection of the fact that anglers were apparently interviewed near the start of their trips, before they had an opportunity to angle extensively. The fact that this survey included times of low angler success during periods not sampled in earlier surveys also makes comparisons to other years difficult. A more complete analysis of the data to determine angler success in 1986 for periods similar to those

examined in previous work would result in a more meaningful comparison but was not considered worthwhile given the quality of present data.

ESTIMATED TOTAL EFFORT AND CATCH

The estimate of total effort for the entire survey was 3373 angler hrs. In terms of "angler days", fishing effort totalled 1296 angler days, based on estimated average trip length of average approximately 2.6 hrs (i.e. $3373 \div 1296$).

Angler effort showed considerable monthly variation, peaking in July (Table 4). Except for April and September, total monthly effort was expended primarily on weekdays (2365 hrs) rather than on weekends (1008 hrs). On a per day basis, however, weekends were the more popular angling stratum except in July.

In 1979, anglers fished 1383 hrs on Lakelse Lake during June to August (Hatlevik et al, 1981). In 1986, this effort increased 63% to 2253 hrs during the same period.

Estimates of catch are outlined in Table 5. Only 190 (9%) of the total cutthroat captured were released. Peak catches occurred during June and July. During June - August in 1979, 517 cutthroat were angled while in 1986, more than three times as many cutthroat were harvested for that period.

Total effort and catch reported here are likely conservative since the river and ice fisheries were not included in the present study. Stream and winter ice fishing are both popular activities on the Lakelse system.

ANGLER RESIDENCE AND TACKLE PREFERENCE

Over 60% of all anglers interviewed were local residents (Table 6).

A further 27% came from Kitimat and Prince Rupert combined. Only 12.8% were from other more remote areas.

Angling from boats accounted for 96.5% of all fishing effort documented during the creel survey. Fly fishing and hardware combined with bait accounted for 38.0 and 36.2 percent respectively of tackle used, with fly casting being the most productive (Table 7).

SUMMARY

1. A creel survey was conducted on Lakelse Lake on 76 randomly selected week (46) and weekend (30) days from April 2 to Oct. 13, 1986.
2. A total of 289 parties were interviewed totalling 484 anglers of which 447 were fishing. The target species was cutthroat trout.
3. An estimated 3373 hrs (1296 angler days) were spent fishing for a total estimated catch of 2418 fish 91% of which were cutthroat trout. Other species captured included rainbow, Dolly Varden, white and Squawfish. Largest catches occurred during June and July.
4. Since 1979, effort has increased 63% while catch success increased from 0.37 to 0.68 fish/hr.
5. Fly fishing from boats by local anglers dominated both the fishery and the catch.

Table 1. Total sampled effort (hrs) and catch in Lakelse Lake by gear type during the 1986 creel survey.

Gear ² type	Hours fished	Catch ¹														
		Cutthroat			Dolly Varden			Rainbow			White fish			Squaw fish		
		K	R	Tot	K	R	Tot	K	R	Tot	K	R	Tot	K	R	Tot
HB	195.8	110	36	146	6	0	6	5	0	5	0	0	0	2	10	12
F	222.0	182	9	191	0	0	0	2	0	2	2	2	4	2	0	2
H	<u>139.3</u>	<u>44</u>	<u>1</u>	<u>45</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>0</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>2</u>	<u>5</u>	<u>7</u>
All	557.1	336	46	382	6	0	6	8	0	8	2	2	4	6	15	21

1. K = killed, R = released.

2. HB = hardware & bait, F = flies, H = hardware only

Table 2. Sampled catch per hour in Lakelse Lake during the 1986 creel survey by gear type.

Catch ¹	Catch/hr															All
	Cutthroat			Dolly Varden			Rainbow			White fish			Squaw fish			
	K ²	R ²	Tot	K	R	Tot	K	R	Tot	K	R	Tot	K	R	Tot	
HB	.56	.18	.75	.03	0	.03	.03	0	.03	0	0	0	.01	.05	.06	.86
F	.82	.04	.86	0	0	0	.01	0	.01	.01	.01	.02	.01	0	.01	.90
H	<u>.32</u>	<u>.01</u>	<u>.33</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>.01</u>	<u>.04</u>	<u>.05</u>	<u>.37</u>
All	.60	.08	.68	.01	0	.01	.01	0	.01	0	0	.01	.01	.03	.04	.71

1. HB = hardware with bait, F = flies, H = only hardware

2. K = kill, R = released

Table 3. Lakelse Lake cutthroat trout creel survey results, 1950-1986.

Year	Hours fished	Cutthroat	
		Catch	Catch/hour
1950 ¹	1294.0	1342	1.03
51 ¹	885.0	768	.86
52 ¹	1240.0	1338	1.08
53 ¹	830.0	1068	1.29
54 ¹	463.7	887	1.93
1979 ²	1383.0	517	.37
1986 ³	561.1	382	0.68

1. (Bilton et al, 1955). May-Sept.
2. (Hatlevik et al, 1981), June, July, Aug.
3. the present study, sampled (unextrapolated) data only.

Table 4. Estimated fishing effort (hours) in Lakelse Lake during the 1986 creel survey.

Month	Hours Fished				Combined	Angler Days ¹
	Weekday		Weekend			
	Total	Per Day	Total	Per Day		
April	63	3.3	76	6.9	139	53.4
May	415	18.7	207	23.0	622	239.0
June	397	19.9	198	19.8	595	228.6
July	1074	48.8	229	25.4	1303	500.6
Aug	238	10.8	117	13.0	355	136.4
Sept	122	6.4	156	14.2	178	106.8
Oct	<u>56</u>		<u>25</u>		<u>81</u>	<u>31.1</u>
Total	2365		1008		3373	1295.9

1. Calculated by dividing total hrs by 2.6 or hrs/angler day.

Table 5. Species specific estimates of fish kept (K), fish released (R) and total catch during the 1986 Lakelse Lake creel census.

Month	Catch														
	Cutthroat			Dolly Varden			Rainbow			White fish			Squaw fish		
	K	R	Tot	K	R	Tot	K	R	Tot	K	R	Tot	K	R	Tot
Apr	21	-	21	11	-	11	-	-	-	-	-	-	-	-	-
May	167	67	234	5	-	5	33	-	33	-	10	10	10	38	48
June	659	75	734	0	-	0	7	-	7	-	-	-	3	7	10
July	984	14	998	-	-	-	-	-	-	-	-	-	5	-	5
Aug	44	16	50	4	-	4	-	-	-	8	-	8	4	8	12
Sept	50	18	68	9	-	9	-	-	-	-	-	-	5	-	5
Oct	<u>81</u>	-	<u>81</u>	-	-	-	-	-	-	-	-	-	-	<u>32</u>	<u>32</u>
All	2006	190	2196	29	-	29	40	-	40	8	10	18	36	99	135

Table 6. Residences of boat and shore anglers fishing Lakelse Lake during the 1986 creel survey.

Residence	Boat Angler	Shore	Total	%
Terrace	205	2	207	42.8
Lakelse	74	7	81	16.7
Thornhill	4	0	4	.8
Kitimat	90	4	94	19.4
Prince Rupert	34	2	36	7.4
Other	<u>60</u>	<u>2</u>	<u>62</u>	<u>12.8</u>
All	467	17	484	100.0

Table 7. Tackle preference of Lakelse Lake anglers interviewed during the 1986 creel survey.

Tackle type	Number of Anglers			Hours Spent Fishing	Success Rate (Catch/hr)
	Boat	Shore	Total(%)		
HB	165	10	175 (36.2)	100.0	0.86
F	179	5	184 (38.0)	113.9	0.90
H	116	2	118 (24.4)	69.9	0.37
NR	<u>7</u>	<u>0</u>	<u>7 (1.4)</u>	<u>0</u>	<u>0</u>
Total	467	17	484	283.8	0.71

REFERENCES

- Bilton, T.H. and M.P. Shepard. 1955. The sports fishery for cutthroat trout at Lakelse Lake, British Columbia. Fish. Res. Bd. Canada, Pacific Coast Stat. Progr. Rept. (104):38-42.
- Cleugh, T.R., C.C. Graham and R.A. McIndoe. 1978. Chemical, biological and physical characteristics of Lakelse Lake. B.C. Fish. Mar. Ser. Man. Rep. 1472. Dept. of Fisheries and the Environment, Vancouver, B.C.
- Hatlevik, S.P., K. Diemert and M.R. Whately. 1981. A creel survey of the Lakelse Lake cutthroat sports fishery, June-August, 1979. Fisheries report No. 79-4, Fish and Wildlife Branch, Province of British Columbia, Smithers, B.C.
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- McKean, C.J.P. 1986. Skeena-Nass area. Lakelse Lake water quality assessment and objectives, Resource Quality Section, Water Management Branch, Ministry of Environment.
- Sinclair, W.F. 1974. The socio-economic importance of maintaining the quality of recreational resources in northern British Columbia. The case of Lakelse Lake. D.O.E., Fish Mar. Ser. Tech. Rep. PAC/T-74-10, 107 pp.
- Warrington, P. 1986. M.S. The distribution of aquatic vegetation in Lakelse Lake and the partitioning of nutrients among sediments, water and plant tissue. Resource Quality Section, Water Management Branch, Min. of Environment, Victoria, 30 pp.

APPENDIX I

1986 - LAKELSE LAKE CREEL SURVEY

Date:

Number of anglers/boat:

Number of rods/boat (actually fishing):

Angler fishing from the shore:

Residence:

Time of Interview:

Number of hours fished prior to interview:

Expected length of entire fishing trip
(for that day only)

Species of fish sought:

Fishing gear in use:

Numbers of each species of fish caught:

APPENDIX II

Data collected during 1986 creel census on Lakelse Lake.

ACKNOWLEDGEMENTS

Information was obtained by Paul Foote and his crew of High Country Guiding Expeditions. Technical aspects were supervised by Bill Chudyk and Ron Tetreau of the Ministry of Environment (MOE) in Smithers. The data collection was funded by Canada Employment and Immigration through the Modified Industrial Labour Adjustment Program (MILAP). The report was edited by Bob Hooton and typed by Pat Neeve.



Province of
British Columbia

Ministry of
Environment
and Parks
RECREATIONAL FISHERIES
BRANCH

MEMORANDUM

MINISTRY OF ENVIRONMENT

MAR 2 1989

MAR. 20/89

FILE
SIGNATURE

TO: COLIN SPENCE

RE: LAKEELSE LAKE CREEL CENSUS - DIONYS D.

DISKETTE CONTAINS:

INTERVIEW.DAT - INTERVIEW DATA IN ASCII FILE

INTERV.DBF - INTERVIEW DATA IN dBASE FILE

INSTANT.DAT - INSTANTANEOUS COUNTS IN ASCII FILE

INSTANT.DBF - INSTANTANEOUS COUNTS IN dBASE FILE

MEMO DESCRIBING RECORD STRUCTURE IS ATTACHED.

CALL ME IF ANY PROBLEMS.

GOOD LUCK!

Angelo F.



To:

Date:

RECEIVED

January 26, 1989

FEB 1 1989

File: 40.3502

FISHERIES RESEARCH
U.B.C.

- NO ZERO FILL

up 228 FORMS

Angelo Facchin
Research Officer
2204 Main Mall
U.B.C.
Vancouver, B.C.
V6T 1W5

Dear Angelo:

Re: 1986 - Lakelse Lake Creel Survey

Here are the explanations, data entry format, definitions, etc. of the creel survey form, an example of which is enclosed.

FIGURE 1

- ① Date: this should be entered numerically as year-month-day. i.e. April 27/86 should be entered as 860427.
- ② Number of anglers/boat: should be entered as 0 (if no boat) or as a number (max. 2 digits).
- ③ Number of rods/boat (actually fishing): should be entered as 0 (i.e. no rods) or as a number (max. 2 digits).
- ④ Anglers fishing from the shore: should be entered as 0 (i.e. no anglers) or as a number (max. 2 digits).
- ⑤ Residence: can be recorded as is. 15 CHARACTERS
- ⑥ Time of interview: should be entered as over 24 hrs. i.e. 4:00 P.M. = 1600 h.
- ⑦ Number of hours fished prior to interview: should be entered as either 0 (i.e. no time fishing prior to interview), or as a number (i.e. 2 rather than two).
- ⑧ Expected length of entire fishing trip (for that day only): should be entered as a number (i.e. 2 rather than two).
- ⑨ Species of fish sought: should be entered in order of documentation and coded as follows:

cutthroat = ct.

Dolly Varden = DV

Rainbow = rb

Whitefish = wf

Squawfish = sq

- Codes should be in CAPITALS

- 3 FIELDS

- FIRST PREFERENCE

- SECOND PREFERENCE

Enter only fish recorded on forms. - THIRD PREFERENCE

10

Fishing gear in use: all information should be entered as bait, hardware and bait, hardware, fly. These are documented on the survey forms as follows:

- B = bait = worms, fish eggs, bacon, roe
- HB = hardware and bait = willow leaf and bait (bait as above)
- H = HARDWARE (NO BAIT) spinner and bait
- F = fly = fly casting line and bait
- ↑ 2 CHARACTER CODE

11

Numbers of each species of fish caught: these should be entered in 2 separate categories, i.e. those kept and those released, and by the number of each species. If fish are not identified as either kept or released, then enter as kept.

eg: fish kept = ct 2
DV 1

fish released = 0

Enter only fish caught i.e. no species for "0" values. Ignore all the rest.

- FISH KEPT
- fields for each species
 - CUTTHROAT
 - DOLLY VARDEN
 - RAINBOW
 - WHITEFISH
 - SQUAWFISH

FISH RELEASED
field for each spec

-2 digit fields

Please let me know if this is satisfactory. There are 228 Lakelse Lake Creel Survey reports.

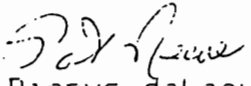
I am not including a description, etc. of the Lakelse Lake Creel Survey (instantaneous count form) since this information could be entered directly (if I understood you correctly). The total number of these forms is 100.

Please let me know the costs associated with the entry of this data and time frame, etc.

Once funding, etc. has been worked out, I will send you all the data and will retain copies here.

Thanks for the help so far.

Cheers!

(for)

 Dionys deLeeuw
 Fisheries Biologist
 Terrace

DdeL/pn

attachment

cc. Bob Hooton, M.O.E., Smithers

1986 - LAKELSE LAKE CREEL SURVEY

- ① Date: April 27 / 86 - should be 860427
- ② Number of anglers/boat: n/a - should be 0
- ③ Number of rods/boat (actually fishing): two - should be 2
- ④ Angler fishing from the shore: two - should be 2
- ⑤ Residence: Terrace - entered as is.

- ⑥ Time of Interview: 4:00 p.m. - should be 1600
- ⑦ Number of hours fished prior to interview: two - should be 2.00
- ⑧ Expected length of entire fishing trip: two - should be 2.00
(for that day only)
- ⑨ Species of fish sought: Cutthroat - should be ct - Dv.
Dolly
- ⑩ Fishing gear in use: Casting hook and worms - should be bait
- ⑪ { Numbers of each species of fish caught: 2 Cutthroat 12" and 14"
1 Dolly 20"
One native woman and one man fishing off Beam Station shore, used pyramid weight with hook 12" above on leader and casting. Said they'd tried fish eggs without luck, they caught all three fish with worms.
should be entered as Kept = ct. 2
Dv. 1
Released = 0

omit all this extra verbiage unless it states extra fish released or kept.

INSTANTANEOUS COUNT FORM

- EACH FORM HAS 3 RECORDS :

1) DATE coded as YYMMDD \Rightarrow 860427

2) TIME PERIOD - 1 character code

M = MORNING

N = NOON

E = EVENING

3) TIME - 24 hour clock 4:00 PM = 1600

4) NUMBER OF BOATS - 3 DIGITS

5) NUMBER OF RODS - 3 DIGITS

There are 100 Forms.

Lake/Se Lake Creel Survey (Instantaneous Count Form)
 Surface water Conditions: White caps and gusting winds Recorders Init: Car

Comments: Two people fished off shore + two from boat.

Time	Number of Boats	Number of Rods
Start Time		
10:00 AM (3)		
Morning (8)		1 record
11:00 AM	Total (4)	Total (5)
Start Time		
1:00 PM (3)		
Noon (2)		1 record
2:00 PM	Total (4)	Total (5)
Start Time		
4:00 PM (3)	12	1111
Evening (2)		1 record
5:00 PM	Total (4)	Total (5)

① Date: April 27/86