A CREEL SURVEY OF THE LAKELSE RIVER CUTTHROAT TROUT SPORTS FISHERY

APRIL - MAY, 1978

BY

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SMITHERS, B. C.

JUNE, 1978

Fisheries Report No. 78-1 (Skeena)

INTRODUCTION

Lakelse River, located approximately 27 km south-west of Terrace, B. C. supports an important cutthroat trout (Salmo clarkí) fishery that peaks during the months of April and May. Local sportsmen have recently voiced concern that the cutthroat population is declining, witnessed by a decrease in the size of the fish taken as well as a decline in overall success. The purpose of this report is to present an analysis of creel census and biological data collected from the cutthroat sports fishery on the Lakelse River during the Spring of 1978.

STUDY AREA

The Lakelse River (Figure 1) flows from Lakelse Lake in a north-west direction, 19.8 km. to its junction with the Skeena River (54^{O} 22'N; 128^{O} 36' W.). The watershed lies approximately equidistant between Terrace and Kitimat and is the major freshwater-oriented recreational area for residents of those two communities.

The Lakelse River supports a variety of anadromous fish. During the months of April and May, steelhead trout (Salmo gairdneri) spawn throughout the main stream. At this same time sockeye (Oncorhychus nerka) and coho (0. kisutch) smolts and pink (O. gorbuscha) salmon fry are moving from the upper Lakelse system down the river to the sea.

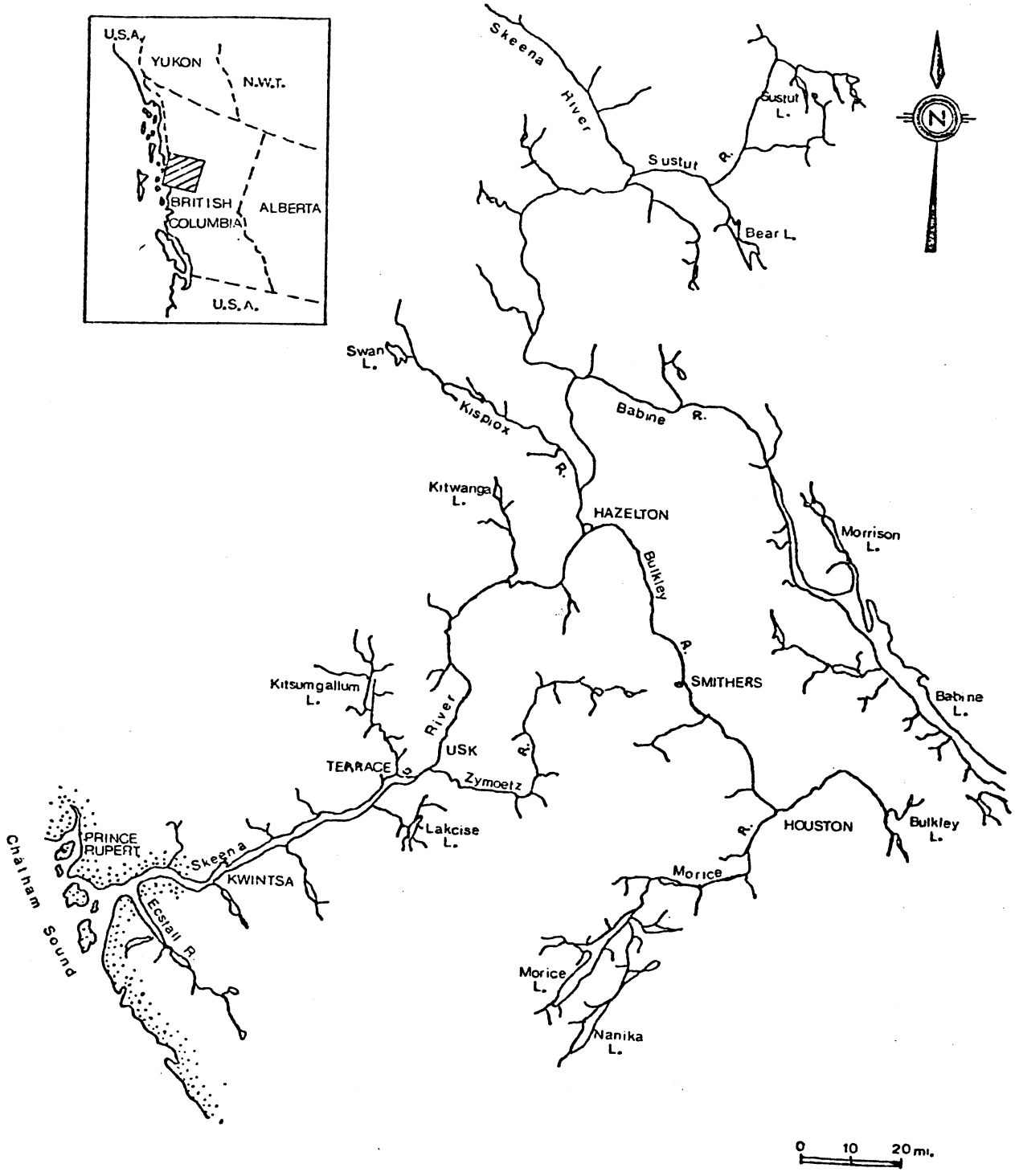

Fig. 1. The Skeena River and main tributaries.

The trout fishery in the river corresponds to the movements of these juvenile salmon which are actively fed upon by immature cutthroat, and "Mature cutthroat usually before May 1, and after breakup of the ice on Lakelse Lake, move downstream from the lake to their spawning grounds in the vicinity of Coldwater Creek" (Bilton & Shepart, 1955). Chinook (0. tshawytscha) and chum (0. keta) salmon also inhabit the Lakelse.

Resident species include rainbow trout (Salmo gairdneri), Dolly Varden char (Salvelinus malma), and mountain whitefish (Prosopium williamsoni). Coarse fish species include squawfish (Ptychocheilus orogonensis) largescale suckers (Catostomus macrocheilus), peamouth chub (Mylocheilus caurinus), redside shiners (Richardsonius balteatus), threespine stickleback (Gasterosteus aculeatus) and prickly sculpin (Cottus asper).

Angling regulations in effect at the time of the survey included a 30 cm. minimum size for rainbow trout, a 20 cm minimum size for all other trout and char, a single hook restriction, a roe ban, and a fly fishing only restriction between Lakelse Lake and the CNR trestle.

METHODS

Creel census data were obtained from Lakelse River anglers between April 2 and May 24, 1978. Anglers were interviewed by Fish and Wildlife personnel and members of the Terrace Steelhead Society.

The Spring sport fishery is concentrated at the upstream portion of the river in the Herman-Coldwater creek area (Figure 2), access to which is via the Beam Station Road from Terrace. Vehicles may park within 0.3 km of the river and numerous trails lead down to the water. A permanent check station was established here and an estimated 90 - 95% coverage of anglers was obtained at this access site during the survey dates. The lower Lakelse River is accessible via the Old Remo White Bottom Route and a CanCel logging road which parallels the south side of the river for a distance of 13 km. Numerous trails lead down from the road to the river. Coverage of the lower end is estimated to have been approximately 40%. With active logging still going on in this area the weekday fishery was only minimal. Spot checks during evenings were undertaken on an infrequent basis while on weekends a roadcheck surveyed approximately 60 - 70% of the anglers.

Each angler was interviewed only after having completed fishing and a record kept of place of residence, time spent fishing, tackle used and the number of each species landed and killed or released.

Biological samples from killed cutthroat were taken whenever possible. Scales were collected for each fish between the dorsal and anal fins above or below the lateral line. The length, weight, sex and state of maturity were recorded.

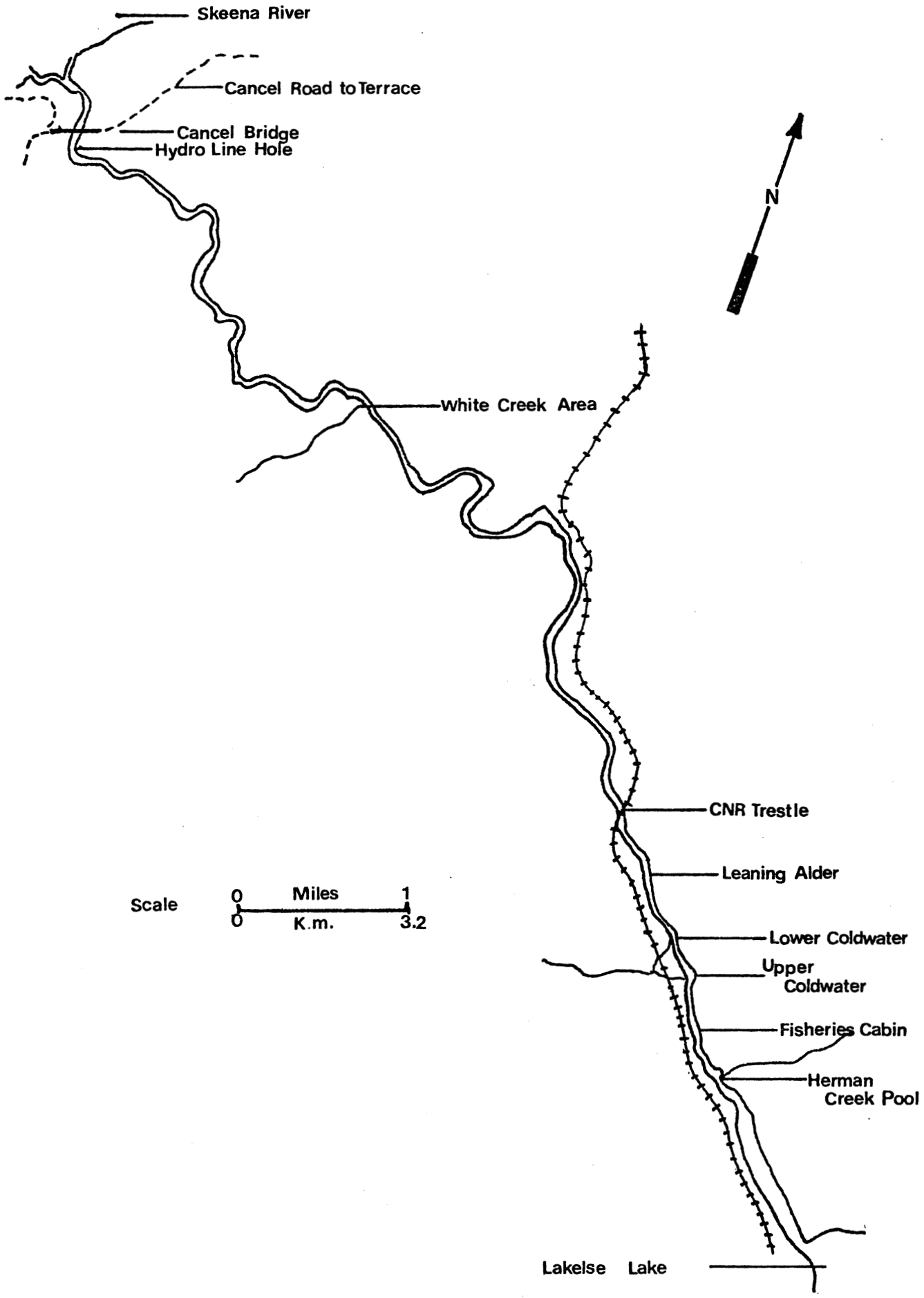

Figure 2. Lakelse River

In the laboratory the scale samples were arranged in groups of homogeneous lengths, and representative samples obtained from each group. Scales were cleaned with detergent and placed on gummed cards which in turn were pressed in acetate The resulting impressions projected onto a screen and magnified were read by two individuals with disagreements settled by a third independant party.

RESULTS

ANGLER EFFORT AND SUCCESS

On the Lakelse River from April 2 to May 24, 639 angling parties were checked by creel census personnel. This amounted to a total of 1026 anglers, or 1.6 anglers per party. These anglers fished for a total of 2981.5 angler hours (Table 1).

Angling intensity above the CNR trestle in the Fly Fishing Only area totaled 1502 angler hours in April and 1017 angler hours in May. Below the trestle, 224 angler hours were expended in April and 247 angler hours in May (Table 2). Fishing pressure peaked in the last week of April with 824 angler hours and the first week of May with 604 angler hours (Table 1).

Success of anglers in terms of cutthroat caught per hour ranged from a low of 0.05 in the second week of April to 0.38 in the last week of April with an average success rate for the fishery of 0.30 fish per hour.

Table 1. Weekly catch statistics (kill plus release) for anglers on the Lakelse River Between April 2 and May 24, 1978.

Date	Angler Hours	Cutthroat	Catch Hour[1]	Steelhead	Rainbow	Dolly Varden	Total Catch/Hour
Apr. 2	5.0						
3-9	139.9	8	0.06	8	3	1	0.14
10-16	277.5	13	0.05	11	2	3	0.10
17-23	472.5	140	0.30	11	20	75	0.52
24-30	824.0	312	0.38	22	55	388	0.94
May 1-7	604.0	212	0.35	11	30	408	1.09
8-14	306.5	83	0.27	7	36	164	0.95
15-21	259.0	92	0.36	3	43	210	1.34
22-24	94.5	31	0.33		13	65	1.15
TOTALS	2981.5	891	X= 0.30	73	202	1314	X= 0.83

[1]Cutthroat only

[2]Total cutthroat, steelhead, rainbow, Dolly Varden

Table 2. Catch statistics (kill plus release) for anglers on the Lakelse River above and below the CNR Trestle for the Months of April and May 1978.

Area	Date	Angler Hours	Cutthroat		Catch/ Hour	Total No. of Trout & Char		Catch/ Hour
Above Trestle (fly fishing only)	Apr. 2-30	1502	464		0.31	1043		0.69
	May 1-24	1017	441		0.43	1317		1.29
				X=	0.37		X=	0.99
Below Trestle (Any gear)	Apr. 2-30	224	9		0.04	29		0.13
	May 1-24	247	23		0.09	91		0.37
				X=	0.07		X=	0.25

Catch per hour for all trout and char in the whole river ranged from a low of 0.10 in the 2nd week of April to a high of 1.34 in the 3rd week of Nay with an average catch of 0.83 (Table 1).

In the Fly Fishing Only Area the average catch of cutthroat per angler hour was 0.37, and all species 0.99. Below the CNR the average catch per angler hour was 0.07 for cutthroat and 0.25 for all species (Table 2).

Approximately 35% of the angling parties landed neither trout or char; 13.1% landed one fish, 9.7% landed more than four but less than nine fish and 13.5% of angling parties landed more than eight trout and char.

Angling intensity on the Lakelse River below the CNR Trestle was divided between spin tackle fishermen (246.5 angler hours or 52%), bait fishermen (119 angler hours or 25%), and fly fishermen (105.5 hours or 2373) (Table 3).

Table 3. Angling intensity of the Lakelse River below the CNR trestle April 2 - May 24, 1978.

Date	Total Angler Hours	Angler Hours		
		Spin	Bait	Fly
April 2 – 30	224	143	27	54
May 1 – 24	247	102.5	92	51.5
TOTALS	471	246.5	119	105.5
% of Totals		52	25	23

ANGLER CATCH, DISTRIBUTION AND TACKLE PREFERENCE

Total River

Of the 891 cutthroat trout landed 477 or 54 percent were released. Seventy-seven percent of the 73 steelhead landed were released, as were 81% of the 202 rainbow trout and 45% of the 1,314 Dolly Varden char (Table 4).

Table 4. The total number of fish killed or released by anglers on the Lakelse River between April 2 to May 24, 1978.

Species	Total Catch	Number Killed	Number Released	Percentage of Catch Released
Cutthroat	891	414	477	54
Steelhead	73	17	56	77
Rainbow	202	28	164	81
Dolly Varden	1314	725	589	45
Whitefish	348	88	260	75

Any Gear Area

Below the CNR trestle spin and bait fishermen caught 40% of the 32 cutthroat landed in this area, releasing 23% of their catch. Fly fishermen accounted for the remaining 60% of the cutthroat catch below the trestle of which 47.4% were released. Approximately 73% of the 55 Dolly Varden landed below the Trestle were taken by fly fishermen who released 55 percent of their catch. Of the remaining 27% of char taken by spin and bait fishermen only 13% were released. Spinning tackle was used to catch 17 of the 24 steelhead landed below the bridge; fly fishermen landed six (Table 5).

Table 5. Number of fish killed (K) or released (R) on the Lakelse River below the CNR trestle by gear type between April 2 and May 24, 1978.

Gear	Steelhead		Rainbow		Cutthroat		Dolly Varden	
	K	R	K	R	K	R	K	R
Fly	0	6	0	2	10	9	18	22
Spin	6	11	0	1	2	1	4	0
Bait	0	1	0	6	8	2	9	2
TOTAL	6	18	0	9	20	12	31	24

Fly Fishing Only Area

The Fly Fishing Only Area above the CNR trestle accounted for 96.4% of the cutthroat landed in the spring fishery over the whole river. Four hundred and thirty or 48% of the cutthroat caught were taken at “Herman Creek Pool”, 205 or 23% were from the area in front of the Fisheries Cabins and 96 or 11% were from “Upper Coldwater”. The section of river from “Lower Coldwater” to the CNR trestle netted 128 or 14% of the total cutthroat catch (Table 6).

The Fly Fishing area also accounted for 67% of the total steelhead catch (49 of 73), 95% of the rainbow catch (193 of 202) and 96% of the Dolly Varden catch (1,259 of 1,314).

Table 6. Weekly totals of the distribution of the cutthroat catch on the Lakelse River between April 2 and May 24, 1978.

	FLY FISHING ONLY							ALL GEAR		
Date	Herman Cr. Pool	Fisheries Cabine	Upper Coldwater	Lower Coldwater	Leaning Alder	The Rock	CNR Trestle	White Cr. area	Hydro Line	Cancel Bridge
April 2										
3-9	2	1		2						3
10-16	6	1		4	1					1
17-23	102	13	6	2	8	8	1			
24-30	184	47	30	5	12	23	9			2
May 1-7	72	57	26	4	9	20	8	3		13
8-14	47	19	14					2		1
15-21	17	43	18		3	9			1	1
22-24		24	2						1	4
TOTAL	430	205	96	17	33	60	18	5	2	25
% of Total	48	23	11	2	4	7	2	1	1	3

In the Fly Fishing Only Area 55% of the anglers fished in "Herman Creek Pool" at some period during their stay on the River. The run at "Fisheries Cabins" was angled by 46% of the fly fishermen while the area between "Upper Coldwater" and "Lower Coldwater" was visited by 31% of the anglers. Only 11% of the anglers fished below "Lower Coldwater" (Table 7).

Table 7. Distribution of anglers in the Fly Fishing Only area on the Lakelse River April - May 1978.

Area Fished	Number of Anglers		Percentage of the Total Number of Anglers	
	April	May	April	May
Herman Creek Pool	309	154	60	48
Fisheries Cabins	223	161	44	50
Upper-Lower Coldwater	181	80	35	25
Below Lower Coldwater	55	35	11	11

Of the 639 fishing parties (total river) interviewed 555 were fly fishermen. Seventy-two percent of the fly fishing parties indicated using a silver minnow fly. Listed in order of popularity are some of the more common Lakelse River Fly patterns:

1. Silver minnow
2. Egg and Eye
3. Doc Spratley
4. Skunk
5. Mudder minnow
6. Silver doctor
7. Royal coachman
8. Mayfly nymph
9. Skykomish sunrise
10. Cow dung

ANGLER ORIGIN

Of the 1026 anglers interviewed 806 were from Terrace and 113 were from Kitimat (total = 90%). Ninety-nine percent of the anglers were B. C. residents (Table 8).

Table 8. Weekly totals by residence of Lakelse River anglers April 2 - May 24, 1978.

Date	Terrace	Kitimat	Other B.C. Residents	Other	Total	% of Total
April2	8	0	0	0	8	1
3 - 9	43	3	8	0	54	5
10 - 16	80	13	13	0	106	10
17 - 23	124	11	2	2	139	14
24 - 30	240	18	24	2	284	28
May 1 - 7	136	40	16	3	195	19
8 - 14	80	12	19	2	113	11
15 - 21	66	14	8	3	91	9
22 - 24	29	2	5	0	36	4
TOTAL	806	113	95	12	1026	
% of Total	79	11	9	1		

CUTTHROAT TROUT LIFE HISTORY

Of the 414 cutthroat killed in the spring fishery, 359 were sampled, ranging in length from 166 to 475 mm (X = 280.2). The fish ranged in age from three to eight years. The mean lengths of a subsample of 210 fish were 225 mm for age 3, 271 mm for age 4, 313 mm for age 5, 339 mm for age 6 and 367 mm for age 7 (Table 9). Age 4 and 5 year old cutthroat were the most abundant in the spring fishery comprising 52.1 and 34.5 percent respectively (Table 10).

Table 9. Age - length relationships of 210 cutthroat trout from the Lakelse River Sport Fishery April 2 - May 24, 1978.

	AGE					
	3	4	5	6	7	8
Number	22	60	104	18	5	1
Mean Length (mm)	225	271	313	339	367	475
Range	166-247	230-330	260-355	310-390	350-383	-

Table 10. Estimated age composition of cutthroat in the Lakelse River Sport Fishery. April 2 - May 24, 1978.

	AGE						
	3	4	5	6	7	8	Total
Number	24	187	124	18	5	1	359
Percent of Total	6.7	52.1	34.5	5.0	1.4	0.3	100

The sex was determined for 354 fish; 143 were males and 211 were females, for a ratio of 2:3. Only 29% of the fish older than five years were males. No significant growth differences could be noted between males and females (Tables 11 and 12).

Table 11. Mean length (mm) of Lakelse River cutthroat by age and sex, April 2 - May 24, 1978.

		AGE					
		3	4	5	6	7	8
♂	Length (mm)	229	275	310	343	380	
	n	9	28	44	6	1	
♀	Length (mm)	230	267	314	337	363	475
	n	12	32	58	12	4	1

Table 12. Average weight (gm) of Lakelse River cutthroat by age and sex, April 2 - May 24, 1978.

		AGE					
		3	4	5	6	7	8
♂	Weight (gm)	106	158	306	383		
	n	7	12	17	3		
♀	Weight (gm)	115	180	304	353	433	1225
	n	6	20	21	4	3	1

Mature fish first appeared in the sample at age 4. Of the 354 cutthroat examined 51 or 14.4% were mature fish, five of which had already spawned. Kelts first appeared in the fishery May 5. The spawning fish were characteristically darker-coloured than immature individuals.

Cursory examination of cutthroat stomachs showed pink salmon fry to be the main food item during April and May with invertebrates gaining importance during the later stages of the fishery.

DISCUSSION

Angling intensity was most heavily concentrated in the Fly Fishing Only area above the CNR trestle. Census coverage in this area was estimated to be not less than 90% during the survey and therefore the total of 2519 angler hours represents a fairly accurate picture of the fishing pressure in this area. The creel census on the lower river below the CNR trestle surveyed only 40% -45% of the fishery. An estimate of 1,000 angler hours for the lower river during the survey represents a fishing pressure in excess of 3,500 angler hours for the Lakelse River during the spring sport fishery of April and May, 1978.

From 1950 to 1954 the Fisheries Research Board carried out a creel census on the Lakelse River and Lake. At this time the fishing season did not open until May 1, with fishing concentrated on the River between Herman and Coldwater Creeks during the month of May and then shifting to the lake in late May and early June. Catch statistics were compiled and totalled for the months May through mid-September but probably reflect the fishing effort and success for the month of May on the river, after which effort switched to the lake. The average number of hours fished per year on the river during the five year study was 983.9 with an average cutthroat catch per hour of 0.94 (Bilton, 1954). While the fishing pressure in 1978 for the month of May (1017 angler hours) in the top section of the river compares closely with that of the early study the catch success of 0.43 is only half that of the earlier study.

Total fishing pressure over the whole river in April and May 1978 (2951.8 angler hours) is almost three times the pressure estimated from May 1 to September 15 in the early 1950's (average 983.9 hours).

During the early Research Board study the only access to the river was by boat from Lakelse Lake. Today only a small number of boats come down from the lake but roads now follow both sides of the river providing numerous access points. Therefore, the concentration of anglers between Herman and Coldwater Creeks has probably not changed much since the 1950's study. Previously angling was done with bait and lures; today the majority of fishermen on the river use flies. The 'fly fishing only' regulation was introduced in 1971 to run from April 1st to May 31st. It was designed to protect spawning steelhead in the river above the CNR trestle, but still allow some form of fishery for the cutthroat trout population. Flies have proved an effective method of catching cutthroat. Below the CNR trestle fly fishermen constitued only 23% of the total fishing pressure but landed 60% of the cutthroat. Fly fishermen, in fact, caught over 98% of the cutthroat reported for the whole river over the two-month census period.

In 1950 the total catch of 1285 trout and char from the lake and river included 1245 cutthroat trout, 8 rainbow trout and 32 Dolly Varden. (Bilton, 1951). Cutthroat comprised 97% of the catch while Dolly Varden made up only 2.5%. In 1978 (in the river) only 36% of the trout and char catch were cutthroat; 53% of the catch was Dolly Varden.

In 1978, age 4 and 5 year old cutthroat were the most common in anglers creels comprising 86.6 percent of the catch. Fisheries Research Board studies on Lakesle River in 1950 found that 83 percent of the cutthroat in the fishery were 3 and 4 year olds (Bilton 1954). Comparison of age-length relationships for the 1950 and 1978 cutthroat fisheries indicates that the earlier study may have failed to account for the first year of growth (Table No. 13). If this is taken into account we find that 51.5% of the catch in 1950 was made up of 4 year olds and 31.5%, by 5 year olds. This compares closely with the results of the 1978 fishery wherein 52.1% of the cutthroat were 4 year olds and 34.5%. were 5 year olds. There does appear to be a heavier selection of older fish in the 1978 fishery. Cutthroat 6 years and older made up 6.7% of the 1978 catch while comprising only 2.2% in 1950 (Table 14). This may be explained by the fact that in 1950 the fishery did not open to May 1 by which time most of the mature older fish had already moved from the lake to their spawning grounds near Coldwater Creek and therefore were not subject to the same degree of fishing intensity as the younger immature fish (Bilton & Shepard 1955).

Table 13. Age-length (mm) relationships of Lakelse Cutthroat in 1950 (Bitton, 1954) and 1978.

	AGE				
	2	3	4	5	6
Lakelse Lake and River 1950	212	274	310	367	
Lakelse Lake 1978		225	271	313	339

Table 14. Comparison of Age Composition of the Cutthroat Fishery on Lakelse River, 1950 (Bitton 1954).

Percent of Catch	AGE 3	4	5	6	7	8
1950[1]	14.8	51.5	31.5	2.2	-	-
1978	6.7	52.1	34.5	5.0	1.4	0.3

[1]Adjusted ages (age + 1)(see text)

The growth patterns of Lakelse River cutthroat were found to be similar to that shown for cutthroat of Great Central Lake, Vancouver Island (Narver, 1975). "The scale pattern indicates 2 or 3 years of slow growth followed by 1 to 2 years of rapid growth that decreases with successive years". Great Central Lake cutthroat are thought to spend their first 2 to 3 years in tributary streams before moving into the lake. To what degree this pattern represents stream and subsequent lake growth or a change from a planktiverous to pisciverous diet is now known (Narver 1975).

The life history of the Lakelse River cutthroat involves a period of residing in Lakelse Lake (Bilton & Shepard 1955). It is suspected that during this period of lake residency cutthroat are subjected to tremendous fishing pressures. The Fisheries Research Board study on Lakelse Lake from 1950 -1954 recorded an average fishing intensity of 942.5 angler hours/year (Bilton & Shepard 1955). In 1973 the fishing pressure on the lake was estimated to be in excess of 200,000 angler hours (Sinclair 1974). To what degree this tremendous increase in fishing pressure has affected Lakelse River stocks will not be known until further research is conducted into the life history of the river population.

The principal food item of Lakelse River cutthroat during April and May is the migrating pink salmon. According to Bilton and Shepard (1955) may-flies and sticklebacks constitute the chief food items during the summer. From late summer to early fall cutthroat also feed upon the eggs of spawning salmon. During the late fall sticklebacks and salmon smolts make up the basic diet of this fish (Bilton & Shepard 1955). It is of interest to note that both sockeye and coho salmon escapments in 1977 were 80 percent less than what they were 10 years ago (Table 15). It is of great importance to the management of the cutthroat fishery to determine the significance of juvenile salmon in the diet of the cutthroat trout and the extent to which the availability of this food item is a limiting factor to the cutthroat population.

Table 16. Sockeye, Coho and Pink Salmon escapement records for Lakelse System. 1963 - 1977.

Year	Sockeye	Coho	Pink
1963	12,000	35,950	505,000
1964	26,991	37,475	1,321,000
1965	25,553	79,675	835,000
1966	16,542	37,500	397,000
1967	13,550	15,500	236,000
1968	11,425	40,800	1,112,000
1969	5,100	16,025	368,000
1970	3,800	26,025	500,000
1971	2,300	15,825	250,000
1972	2,300	8,325	850,000
1973	1,450	3,925	500,000
1974	2,250	5,500	250,000
1975	2,250	1,875	750,000
1976	2,300	1,625	250,000
1977	2,300	4,000	300,000

The Spring sports fishery on the Lakelse River is very important to the people of the Terrace-Kitimat Region because of the lack of alternative fishing opportunities at this time of year. Most lakes and rivers in the region are still frozen over or are not accessible. It is for this reason that close monitoring should be maintained of the cutthroat population and the necessary measure introduced to ensure that this remains a viable fishery.

SUMMARY

1. From April 2 to May 24, 1978, 1026 anglers on the Lakelse River fished for a total of 2981.5 angler hours.

2. Anglers landed 891 cutthroat trout for a success rate of 0.30. The total catch, which included cutthroat, steelhead, rainbow and Dolly Varden, provided a success rate of 0.83 fish per hour.

3. Fishing pressure was greatest during the last week of April and the first week of May with 1,428 angler hours recorded. Approximately 59% of the cutthroat landed during the survey were taken at this time for a catch per angler hour of 0.37.

4. The total catch success rate in the “Fly Fishing Only Area” was 0.99 while the success rate below the CNR trestle was 0.25.

5. Approximately 35% of the 639 angling parties interviewed landed no fish. Only 29.6 percent of angling parties landed more than 4 trout and char.

6. Anglers released 54 percent of the 891 cutthroat landed; 77 percent of the steelhead, 81 percent of the 202 rainbow trout and 45 percent of the 1,314 Dolly Varden.

7. The “Fly Fishing Only Area” accounted for 96.4% of the cutthroat landed in the spring fishery, of which 48 percent were taken at “Herman Creek Pool” and 23 percent from the “Fisheries Cabins”.

8. Ninety percent of the anglers were from the Terrace-Kitimat region. Only 1% were non B.C. residents.

9. Cutthroat ranged in age from 3 to 8 years and in length from 166 to 475 mm ($x = 280.2$).

10. The bulk of the catch was made up of ages 4 and 5; 52.1 and 34.5% respectively.

11. Female cutthroat out-numbered males by a ratio of 3:2.

12. Approximately 14% of the cutthroat catch were mature individuals of age 4 or older.

RECOMMENDATIONS

1. As a means of reducing the exploitation of cutthroat stocks in the Lakelse system, it is recommended that the present catch limit of 8 cutthroat be reduced to 4 for the Lakelse River. While still allowing some harvest to take place, it's felt that this special regulation will make anglers more aware of this declining resource thereby encouraging a greater number of fishermen to release their fish.

2. Though total closure of the cutthroat fishery is not recommended at this time, partial closure should be considered if present trends in the fishery continue. This could be accomplished by not opening the fishery until May 1st.

3. The residents of the Terrace-Kitimat Region should be properly informed through the media of the present condition of the Lakelse River cutthroat stocks.

4. The population ecology of Lakelse River cutthroat should be examined. Spawning areas and rearing habitat should be properly identified. Competition of cutthroat with resident rainbows for spawning sites should be investigated. Studies into the interaction and competition of cutthroat with steelhead, rainbow, coho and Dolly Varden for rearing habitat should be initiated.

5. A creel census on Lakelse Lake should be undertaken during the summer and winter fisheries to determine the fishing pressure on the lake and the effect this is having on the cutthroat stocks.

6. The effects of speed boats on rearing habitat in Lakelse Lake should be investigated and the practicability of zoning considered.

7. The importance of juvenile salmon in the diet of Lakelse cutthroat should be examined and benefits to the cutthroat population present sockeye stocks are enhanced should be determined.

ACKNOWLEDGEMENTS

The efforts of the Steelhead Society of Terrace in providing manpower and logistic support for this project is greatly appreciated. Special thanks to P. Foote of Terrace, who contributed a substantial amount of time and effort into the project. The support of D. Crack, Terrace Conservation Officer, was appreciated. I am grateful to L. Johnston of Lakelse Lake for providing material on the earlier Fisheries Research Board study.
S. Hatlevik and M Whately assisted with the scale interpretation for which I am very grateful. Also thanks to M. Whately for reviewing and editing this report.

REFERENCES

Bilton, T.H. 1951. Creel Census Studies at Lakelse Lake, Skeena River. Fisheries Research Board of Canada. No. 87. pp 39 - 42.

Bilton, T.H. 1954. The Cutthroat trout (Salmo Clarki) population of Lakelse Lake, B. C. Results of the 1950 - 1953 Creel Census Studies. Fisheries Research Board or Canada. Manuscript Report.

Bilton, T.H. and M.P Shepard 1955. The Sports Fishery for Cutthroat trout at Lakelse Lake British Columbia. Fisheries Research Board of Canada. No. 104 pp 38 - 42.

Narver, D.W. 1975. Notes on the Ecology of the Cutthroat trout (Salmo clarki) in Great Central Lake Vancouver Island, British Columbia. Fisheries and Marine Service Technical Report No. 567.

Sinclair, W F. 1974. The Socio-Economic Importance of Maintaining the Quality of Recreational Resources in Northern British Columbia. The Case of Lakelse Lake. Evergreen Press, Vancouver, British Columbia.