

SUMMER CARIBOU CENSUS - JULY 31 TO AUGUST 3, 1984  
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INTRODUCTION:

This was the summer census of caribou centered in Wells Gray Park. The objectives of the survey were to obtain a population estimate of caribou summering in Wells Gray Park and on Trophy Mountain, immediately to the south, and to obtain sex and age ratio data of the herd. The census was part of the Parks Branch's Regional Management Program and the helicopter rental was paid by them. All other costs were borne by the Wildlife Branch.

A large snow pack remained on the mountains in mid July and even with postponement of the survey to month's end it was still larger than desirable for the census. However, as detailed later, weather conditions were almost ideal so we decided to proceed.

On August 2, 1984, the helicopter was commandeered by the Parks Branch for administrative flying, so we did not complete coverage of the northern part of the park. The helicopter had been committed for fighting fires on August 4, 1984, so the survey was concluded on August 3, 1984.

METHODS:

Known caribou range within the park was flown around the contours at about 1,900 metres to locate tracks or animals. Air speed of the Bell Jet Ranger varied from 80 to 110 kilometers per hour and averaged about 90 kilometers per hour during the search. When tracks were found, they were followed until the animals were located or until the tracks were lost in the timber. If the animals were not located, tracks were counted to account for these animals. When caribou were located, we classified them as to sex and age using presence or absence of antlers, antler size, or presence or absence of a vulval patch where antlers were not distinctive.

All flights were carried out as near as possible to the midday period to ensure that the maximum number of caribou would be bedded on snow patches. The earliest counts began at 10:19 AM and our later termination at 16:45.

A fuel cache was established at the south end of Clearwater Lake to reduce ferry time. However, due to short range of the 206 that we were flying, and the long distance from Kamloops, ferry time accounted for 29% of the total flying time of the survey.

PERSONNEL:

The pilot for all flights was Bob Ingram, who had little experience in game surveys but joined in the search for animals, often observing them before others in the crew. Doug Jury plotted the flight route and locations of animal sightings on 1:100,000 maps. Ralph Ritcey classified caribou as noted above. In addition, there was a Parks Branch observer on hand for each flight: July 31, 1984, Chris Kissinger; August 1, 1984, Pat Rogers; August 3, 1984, Tony Lively.

WEATHER CONDITIONS:

Low elevation weather had been hot for eight days prior to the flights and high maximum temperatures were recorded at Blue River (Table I) for three of four census days.

TABLE I: TEMPERATURE COMPARISONS FOR YEARS OF SUMMER CENSUS

FROM BLUE RIVER WEATHER STATION

Year	Mean Monthly Temperature		Maximum Temperature on Census Days
	June	July	
1964	13.2°	16.2°	26.1°
1965	13.6°	17.5°	20.6°, 17.2°, 22.8°
1970	16.7°	18.3°	30.6°, 33.9°
1975	12.2°	18.1°	27.8°, 22.2°
1980	14.3°	16.0°	27.0°, 26.5°
1982	15.6°	15.4°	31.5°, n/a
1984	13.7°	16.4°	31.1°, 27.2°, 30.0°, 28.5°

However, due to late persistence of the snow pack, high elevation temperatures were lower than expected. In cloud cover on August 1, 1984, the 11:00 AM temperature was 11° and had only reached 18° at 1:00 PM at 2,000 metres.

At the time of the survey, the snowpack had been melted to about the 2,000 metre level in open areas in the southern part of the park. However, in timbered areas, especially on northern aspects, there was much snow down to 1,800 metres. In the high precipitation belt northeast of Murtle Lake, there were extensive snow fields persisting to timberline and below.

RESULTS:

We observed 55 caribou (Table II) in 8.4 search hours in and adjacent to Wells Gray Park, compared to 74 caribou in 7.9 search hours in 1982. In addition, we tallied tracks of 25/30 that had gone down into timbered areas where they could not be located. There was a minimum population then of 80 - 85 caribou in the area surveyed.

TABLE II: CARIBOU SEX AND AGE RATIOS - WELLS GRAY PARK - SUMMER SURVEYS

Year	Total observed		Cows	Calves	Small antlered		% Calves	Calves :100 Cows
	Wells Gray	Bulls			Yrlg.	Adults		
1964	148	23	31	28		66	19	n/a
1965	61	16	34	11		--	18	32
1970	308	35	68	58		147	19	n/a
1975	97	23	52	16		6	16	31
1975	123*	28	65	24		6	20	37
1980	69	14	29	17		9	25	n/a
1980	79**	14	34	21		10	27	n/a
1982	74***	12	32	15	9	6	20	n/a
1984	55	17	31	4	3		7	13

\* plus adjoining M.U. 3-40

\*\* plus adjoining M.U. 3-43

\*\*\* plus adjoining M.U. 3-40, 3-44, 5-15

Comparing counts made in individual census blocks to those of 1970 (Table III) we find that the most drastic reductions were in peripheral areas, while those most central suffered least.

The indicated calf crop of 79% or 13:100 females was the lowest yet recorded.

TABLE III: COMPARISON OF NUMBERS OF CARIBOU SEEN IN PERIPHERAL AND CENTRAL AREAS OF WELLS GRAY PARK IN TWO SUMMER SURVEYS

Year	PERIPHERAL AREAS					Totals	% Reduction
	Isosceles	Persius	Battle/ Raft	McCrae	Strait Lk North		
1970	42	23	19	27	30	141	
1984	0	0	0	0	3	3	
Reduction	42	23	19	27	27	138	98%

  

Year	CENTRAL AREAS				Totals	% Reduction
	Hogue Mtn.	Mobley/ Anderson	Vimy Ridge	Center Mtn.		

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1970	28	18	20	1	49	66	
1980	11	3	11	1	15	41	
Reduction	17	15	9	0	34	40	61%

In addition to caribou, we observed a good variety of other wildlife species including: grizzly (8), moose (5), mule deer (5), mountain goat (15), golden eagle (5), and a gray timber wolf (Table IV).

TABLE IV: OTHER WILDLIFE OBSERVED ON WELLS GRAY FLIGHTS

Species	Number seen	Classification
moose	5	4 males, 1 female
mule deer	5	3 males, 2 unclassified
mountain goat	15	13 adults, 2 kids
grizzly bear	8	2 females, 2 cubs, 2 yearlings, 1 small adult, 1 large adult
timber wolf	1	adult
marmot	2	
golden eagle	7	
ptarmigan	1	
blue grouse	2	

Of 21 observations of one or more caribou, 16 (76%) were first sighted on snow (Table V).

TABLE V: CARIBOU OBSERVATIONS MADE IN THE 1984 CENSUS

OBS #	TIME	ELEVATION METERS		SNOWPATCH		NUMBER IN GROUP	ADULT		YEARLING			CALVES
		METERS	METERS	YES	NO		M	F	M	F	UNCL	

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1	13:00	2,000-	x		4		2		1	1
2	13:00	2,300	x		3	3				
3	13:00		x		6	3	2			1
4	13:30	2,000+	x		4	2	2			
5	13:31	2,100	x		6	4	2			
6	13:31	2,000	x		3		3			
7	14:20	1,890	x		1		1			
8	10:18	2,000	x		1			1		
9	10:27	2,000		x	1			1		
10	11:18	2,100		x	2	1	1			
11	11:51		3x	2x	5		4			1
12	12:03	2,100	x		1		1			
13	12:05	2,000		x	4		3			1
14	14:06	2,000	x		1		1			
15	15:46	1,900	x		4	1	3			
16	15:47	1,900	x		2	1	1			
17	15:49	1,900	x		2		2			
18	15:58	2,050		x	1	1				
19	11:15	2,060	x		1		1			
20	12:34	2,000-	x		3	1	2			
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4					16	5	55	17	31	1 1 1

#### DISCUSSION:

Our tally of 80 - 85 caribou in the southern park and adjoining Battle-Trophy Mountain areas in this census is somewhat below the 1984 winter estimate of 139 (June 1984) for the entire park. However, only about 70% of the summer range was covered so, by extrapolation, the park count

for summer would be approximately 120 animals . . . . not too far from the winter count. With the possibility of significant numbers of the animals going undetected in timber areas in the census, and because we were not able to consus exactly comparable areas in 1982 and 1984, we cannot make comparisons between populations in the two years. However, all four summer counts since 1970 have been lower than the one in that year. Winter range surveys in 1977, 1979, and 1984 have failed to locate numbers even approaching those known to be present in 1970, so estimates from winter surveys tend to support the low estimates from the summer survey. There is thus very strong evidence for a population decline subsequent to 1970 and indications that the population trend has continued downward since that time.

Reasons for the decline are not obvious, but are probably tied to excessive “natural” mortality in the first year of life or excessive human-induced mortality in all years. Since legal harvests have been inconsequential since 1970, we can eliminate this as a major cause of the decline (Table VI).

TABLE VI: LEGAL CARIBOU HARVESTS, WELLS GRAY PARK, 1958 - 1974

Year	Number Harvested	Data Source
1956	11	records of game checks within the Park
1957	7	records of game checks within the Park
1958	8	records of game checks within the Park
1959	7	records of game checks within the Park
1960	18	records of game checks within the Park
1961	11	records of game checks within the Park
1962	27	records of game checks within the Park
1963	n/a	records of game checks within the Park
1964	29	hunter sample plus guide returns
1965	24	hunter sample plus guide returns
1966	36	hunter sample plus guide returns
1967	25	hunter sample plus guide returns
1968	18	hunter sample plus guide returns
1969	15	hunter sample plus guide returns
1970	19	hunter sample plus guide returns
1971	18	hunter sample plus guide returns

1972	15	hunter sample plus guide returns
1973	5	hunter sample plus guide returns
1974	3	hunter sample plus guide returns
1975	2	hunter sample plus guide returns
1976	2	hunter sample plus guide returns
1977	2	hunter sample plus guide returns
1978	season closed	

However, from 1970 through 1982 there were seven known illegal kills near the park and it is quite likely that undetected kills numbered substantially more than those detected. If this is so, illegal killing could be a major factor in the decline. The observation that numbers dropped most drastically in peripheral areas is consistent with the hypothesis that illegal killing may be responsible for a major part of the population decline.

#### PREDATION:

Wolf and/or grizzly predation is known to have significantly depressed productivity of some caribou herds in northern British Columbia (Bergerud 1978). In Wells Gray Park, wolf numbers have probably changed little since the initiation of the caribou census. In 1964, the park wolf population was estimated at 14 - 15; in 1975, 9 - (17 - 21); and in January 1984, Jones (op cit) estimated that there were 10 or 11 wolves within the park boundaries. However, it is possible that grizzly numbers have increased in the past decade. The last grizzly season in the park was in the spring of 1974. Before this, hunters were allowed a spring and fall season on grizzly, and prior to 1965, did not even require a tag. The annual take of three grizzlies within the park, and an additional harvest of unknown size outside the park, could have been sufficient to significantly depress the population. The ten year closure of hunting should have allowed ample time for recovery. Indeed, our sighting of eight grizzlies and tracks of an additional two bears represents the most grizzlies accounted-for in the seven summer surveys by helicopter.

#### WEATHER:

Winter snowpack was above average throughout the North Thompson and its long persistence may have been a factor in calf survival. On June 1st, snowpacks averaged 20% above normal, and with sub-normal temperatures for the month, snow completely covered sub-alpine openings on moderate slopes to about 1,700 metres at the beginning of July. It is likely that most caribou calved at lower elevations than normal, where they would be more subject to predation by wolves, black, and grizzly bear.

In addition to the long persistence of the snow, it must have been much less stable than normal, for we saw the remains of avalanches in just about every steep-sided drainage that we surveyed. Many of the avalanches had crossed valley floors and flattened timber stands as they moved up the opposite slopes. There may have been some direct mortality from avalanches, or the deep,

soft snows that produced them could have restricted caribou movements to the extent that malnutrition of pregnant cows affected calf survival, and that survival to yearling age was also affected. This is highly speculative, of course, but by no means improbable.

In 1972 we recorded a low calf (short yearling) crop in a late winter survey which covered ranges in and adjacent to the southern part of the park. The low percentage of calves (10%) in that survey probably resulted from poor overwinter survival. The early winter had been continuously cold, and caribou were imprisoned by unsettled snow for a long time in the food-poor winter range of low elevation. Winter starvation of calves is not unlikely in these circumstances.

#### HABITAT LOSS:

It is difficult to relate mortality to habitat loss in the short term, because caribou are highly mobile and move out of unsuitable habitat rather than remain there to starve. Possibly, the shrinkage of traditional winter ranges outside the park at the headwaters of the Mad and Raft Rivers has forced caribou to winter on less suitable ranges in the park. The result would be lower overall survival and the adverse weather could have affected both the 1983 and 1984 calf crops.

#### SUMMARY AND RECOMMENDATIONS:

The survey indicated that the Wells Gray caribou numbers are still well below the high recorded in 1970. However, the method of counting caribou on snow patches is limited by the fact that an unknown number of animals remain in cover below the census area. That number is probably dependent on a number of factors, the most important being the size of the snowpack and temperature both at the time of the census and in the period preceding it. A study of caribou movement in the Quesnel Highlands by monitoring radio-collared animals is being carried out by Daryl Hebert and staff at Williams Lake and should present findings relevant to this problem, but a precise estimate of animals missed would involve marking many more caribou from different areas within the park.

An alternative to the mid-summer count is a survey in late winter when most animals are visible in the upper parts of the sub-alpine zone. Snow conditions allow for easy tracking at that time and missed animals within the census area are readily accounted for. However, even at this time an unknown number of caribou may be in the cedar/hemlock zone to confound the count. A late winter survey should be preceded by a thorough review of the three radio tracking studies relevant to caribou in Wells Gray type habitat. (Antifeau, Simpson, Seip, and Herbert et al.)

Observed low recruitment in a single year is not a cause for concern in itself, but does indicate the need for more frequent monitoring to determine if recruitment is adequate to maintain the population. The measurement of recruitment to yearling age is probably more significant than calf production observed in mid-summer, and a late winter survey would give a better estimate of this statistic.

We recommend that inventory of caribou continues to remain high on the priority list for wildlife in Wells Gray Park, and that the next attempt to arrive at a total numbers estimate be by means of a late winter survey. As mentioned above, this should be preceded by a review of recent and ongoing studies of radio marked caribou to determine the optimum census date and to interpret census results.



## REFERENCES:

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