

CARIBOU CENSUS - WELLS GRAY PARK  
MARCH 25 THROUGH MARCH 29, 1985

R. W. RITCEY AND A. STEWART, Unpublished Report.

## INTRODUCTION

There have been seven aerial summer censuses of caribou in Wells Gray Park in the period 1964 through 1984. The technique of summer surveys was to count caribou on or near snow patches above timberline in the heat of July. However, the success of this technique depends on nearly all of the animals being in the alpine where they are readily observed. In several years, low counts were related to weather at the time of the survey or the size of the snow pack when the survey took place. Total numbers seen on the flights fluctuated widely.

Three winter surveys to locate winter ranges had covered part of the park, and the most recent (Jones 1984) indicated the possibility of carrying out a complete census of the park in late winter. The most obvious advantage of the late winter survey is that deep, continuous snow allows caribou to be readily trailed so few animals should be overlooked. Another advantage is that helicopters and experienced pilots are usually more readily available than in July, which is often the height of the fire fighting season.

The Parks Branch Regional Office funded the census as part of their wildlife management program, and the objective was to obtain a complete count of all caribou within the Park.

## METHODS

We flew in a Bell Jet Ranger following contours near the 1800 M level, covering nearly all of the suitable winter range within the park and known adjacent ranges to the south (Map 1).

### MAP 1: THE STUDY AREA Caribou Census Wells Gray Park, March 25 - 29, 1985

We maintained a height of about 100 metres above ground level and an air speed ranging from 100 to 160 KMH, averaging near 140 KMH. We adjusted contour level, height above ground, and air speed in response to changes in timberline, presence of tracks, and changes in visibility. The 1,800 M contour brought us slightly below timberline in most of the Park.

When we found caribou tracks, we followed them until we located the animals or until (4 occasions) we determined that the animals had left the area. Usually it was not difficult to follow tracks to the animals, but when tracks were abundant and confusing, we flew in a grid pattern to more quickly find the animals. On two occasions we returned another day to successfully locate animals whose presence was indicated by tracks but we could not find on our first attempt.

When caribou were located, we classified adults as to sex by the presence or absence of a vulval patch or by antler size and configuration (Bergerud 1976). Since there are only minor differences in configuration between antlers of females and yearling males, we did not attempt to classify these by antlers alone except where males bore obviously large antlers. We found that the vulval patch was most readily observed when the animals lifted their tails while running downhill. Caribou labouring uphill in deep snow seldom raised their tails.

A fuel cache at the Park entrance supplied the survey, but deep snow concealed a drum of fuel we had hoped to find at the head of Hobson Lake.

## PERSONNEL

The pilot for all flights was Jim Stone, a capable pilot but relatively inexperienced in animal census. Observer and navigator Andy Stewart plotted the flight route and marked animal locations on 1:125,000 maps. Ralph Ritcey classified the caribou as noted above, and recorded time and elevation of the observations. Bob Scheer was the third observer on flights 1, 2, 3, and 4, and was replaced by Chris Kissinger on flights 5, 6, and 7.

## WEATHER

Fog and snow squalls interrupted several flights, and flat light made it difficult to see tracks in the heavy overcast. This did not result in our missing tracks, but we were forced to fly lower and slower than in periods of bright sunshine when shadows enhanced our ability to pick up tracks. A heavy snowfall about 72 hours prior to the first flight made it easy to distinguish between recent and older tracks. Temperatures ranged from  $-9^{\circ}\text{C}$  to  $+4^{\circ}\text{C}$  during the fire day period, with afternoon temperatures being slightly above zero. The snow pack was settled with recent powder allowing caribou to sink to a depth of one metre in some areas. However, in most areas, sinking depth appeared to be slightly under .5 metre.

## RESULTS

We observed 178 caribou in 13.5 searching hours and tallied tracks of an additional 5 caribou that we believe were in the area at the time of the survey. We classified 45 bulls and 62 cows in the adult sample, which 30 adults were not classified as to sex (Table i). There were 19 calves, making up 12% of the age classified animals. If you assume that the unclassified adults had the same sex ratio as those classified, the total sample becomes 58 bulls, 75 cows, and 19 calves or, as a ratio, 77 bulls: 100 cows: 25 calves.

The caribou occupied a narrow elevational band; only a little over 500 vertical metres separated the lowest (1,650 M) and the highest (2,150 M) observations. However, over 70% of the caribou were observed at elevations above 1,800 M.

The average group size was 6.1, with a range of 1 to 22. The comparable group size in 1985 was 4.2.

A comparison of group locations in two winters given in Table II (some groups combined where tracks joined, so group sizes not comparable to above) shows the variation between years. Only two wintering areas were occupied in common in both years but the affinity for traditional areas is seen in that 10 occupied areas were located 5 km or less apart in the two winters.

We recorded tracks of other species in the search area as follows: porcupine 24, wolverine 10, goat 8, and moose 1. We saw 1 goat. Other wildlife recorded included one golden eagle, one Franklin grouse, and a pileated woodpecker.

We saw a pack of eight wolves on a meadow on Lone Spoon Creek while we were ferrying north. Other wolf sign was observed at the north end of Hobson Lake, at Clearwater Lake, and on the Murtle River. There was no wolf sign associated with wintering caribou.

TABLE I: CARIBOU OBSERVATIONS IN MARCH 1985 CENSUS

Observation #	Date	Time	Elevation (metres)	Number in group	Bulls	Cows	Adults	Calves	Unclassified
1	85/03/25	11:43	1,830	8			8		
2	85/03/26	08:50	1,920	2			2		
3	85/03/26	09:00	1,650	4			4		
4	85/03/26	09:25	1,800	5	2	2		1	
5	85/03/27	08:40	1,880	1	1				
6	85/03/27	09:05	1,900	1	1				
7	85/03/27	09:05	1,950	4	2	2			
8	85/03/27	10:20	1,880	7	5	1		1	
9	85/03/27	10:58	1,850	4	1	2		1	
10	85/03/27	11:08	2,000	3	1	1		1	
11	85/03/27	13:30	2,050	6			6		
12	85/03/27	13:35	1,970	8	5	9	2	2	
13	85/03/27	13:37	2,000	10					
14	85/03/27	15:14	1,970	9		6	1	2	
15	85/03/28	09:05	2,030	2	1	1			
16	85/03/28	10:00	1,780	10	3	5		2	
17	85/03/28	10:22	1,970	2		1		1	
18	85/03/28	10:34	2,060	11		8		3	
19	85/03/28	14:50	1,840	22					22
20	85/03/28	15:40	2,160	21	6	9	4	2	
21	85/03/29	08:55	1,650	2	1	1			
22	85/03/29	09:04	1,650	3	1	2			
23	85/03/29	09:08	1,650	5	5				
24	85/03/29	09:57	1,920	2	1	1			
25	85/03/29	09:59	1,800	11	5	3	2	1	
26	85/03/29	10:03	1,850	5		5			
27	85/03/29	10:12	1,740	1	1				
28	85/03/29	11:00	1,700	3	3				
29	85/03/29	11:05	1,770	6		3	1	2	
				178	45	62	30	19	22

TABLE II: COMPARISON OF NUMBERS AND LOCATIONS OF CARIBOU  
IN MARCH 1985 AND FEBRUARY 1984 FLIGHTS

1985 Location	Number	Distance (KM) to location of nearest caribou or sign on 1984 survey	Number	1984 Location
Battle Mtn	21	2.5	6	Battle Mtn.
Fish Lake Hill	22	--	--	Not flown
Arthur Creek	9	1.5	T	Arthur Creek
Macrae Creek	3	20	T	Mt. Mobley
Munter Basin	4	11	T	Mt. Mobley
Kilpil	4	1	3	Kilpil
Pilpil	2	0	T	Pilpil
Donald Creek	5	6	1	Clearwater Lake
Mt. Mobley	7	1	T	Mobley Ridge
Molin Creek Ridge	4	1	3	Molen Creek Ridge
Little Anderson Lk	1	4	T	Mt. Mobley
Mt. Hogue	9	8	3	Molen Creek Ridge
Buchanan Peak	18	8	5	Ovis Creek
Hamany Hall Cr	9	6	T	Hobson Lake
Hobson Lk W	10	0	9	Hobson Lake W
Hobson Creek	13	5	T	Hobson Creek
Hobson Creek	6	4	T	Hobson Creek
S Mt. Goodall	13	8	4	Mt. Avis NW
Batoche Peak	6	6	6	Mt. Huntley
Lickskillet Cr E	9	4	6	Goat Creek
Lickskillet Cr W	2	11	6	Goat Creek
Average:	8	5.4	4.2	

## DISCUSSION

The figure of approximately 183 caribou and tracks tallied for the Park's winter ranges and those on its immediate borders is the highest since 1970. Of those, 160 were within the Park, so the count is very close to the 139 estimate of Jones for the winter of 1984.

With any census there are problems of under or overestimating the actual population size because some animals within the counting area are overlooked or because some animals or their sign are counted more than once. Furthermore, animals usually part of the population may be outside the area at the time of the census, or some not normally there may have entered the area.

We believe that few animals were missed in the areas above 1,600 metres within the Park border. A few old tracks in the headwaters of the Azure watershed indicated previous use by 4 - 7 caribou but these probably had left the Park before the survey. With unbroken soft snow, it was easy to trail caribou long distances; in the watershed north of Hobson Creek, we trailed a group of caribou for 7 straight-line map kilometers. The group crossed 6 small, steep-sided drainages and with circling probably travelled more than kilometers in a couple of days. In contrast, 21 caribou on Battle Mountain had spent five days in a steep walled basin of less than 4 sq. km.

On 27 of 29 occasions we were alerted to the presence of caribou by first finding fresh tracks. Once we may have overlooked a single caribou atop a ridge but on the other occasion we would have shortly crossed a visible trail. Because caribou tend to move long distances in foraging, and because we saw no tracks at low elevations in our ferry trips between search areas, it is unlikely that we missed many caribou at low elevations outside the limits of our high elevation intensive coverage.

Double counting was not a problem as caribou were well separated in small, discrete bands.

Radio marked animals would answer the question of whether or not a significant number of caribou are below the parkland habitat at the time of a particular census. This may involve a large sample to be marked as the population is made up of a number of relatively small bands whose composition may vary from time to time (Antifeau 1980). It is debatable if the value of obtaining a firmer estimate of numbers is worth the cost at the present. Radio marking and monitoring would more than double the cost of a census.

The bull: cow ratios from the census are open to question because a large percentage of the adults went unclassified. However, in the absence of hunting, it would be expected that an increase in the bull: cow ratio would occur. Of 45 bulls classified, 8 (18%) bore antlers whereas 39 of 52 (75%) cows carried both antlers and 7 (13%) carried one antler.

The 12% calves in the age classified sample is considerably higher than the 7% observed in the 1984 summer survey, but still well below the 19.5% average of 6 previous summer surveys and 16% average of 3 winter surveys. The disparity between the '84 summer results and the '85 winter results could be due to sampling error due to small sample size in the summer survey and from identifying a few long yearlings as calves in the winter survey. Bergerud (1978) states that 'Calves are exceedingly difficult to separate even by October' and discusses the difficulty of classifying caribou by size alone in winter flights. The low recruitment rate, if continued, will mean that a population increase, if any, would be slow.

We found no caribou on Trophy Mountain south of the Park where logging was in progress at the time of the flight. The biophysical flight of the previous winter found no caribou or sign in the Park

south of Battle Mountain although Trophy Mountain itself was not flown. The desertion of Raft Peak as a wintering area has occurred since the early seventies following fire and logging, and it is possible that logging development on the Trophies may also render most of this as unusable for a time. The probable desertion of the Trophy winter range for two years may indicate that the area set aside as a reserve for caribou winter range may be too small, although this range may be re-occupied in future years.

An inventory design and schedule for future caribou inventories of Wells Gray Park should be based on objectives as well as available money. Given ideal conditions, Wells Gray caribou can be successfully counted in either summer or winter; however, the success of summer census is more weather related than is that of winter surveys. More work with radio marked animals would give us an appreciation of how many caribou may be below the survey area at the time of the census, whether in winter or in summer. The work of Hebert and Seip in the Quesnel Highlands and Simpson in the Monashees should be useful in determining the conditions under which future censuses should be flown and in interpreting survey results.

While summer surveys give the best indication of early productivity, summer losses render them inadequate as a measure of recruitment to the herd. Although there is some difficulty in identifying the calf component of the population in late winter, calves are sufficiently different in size and conformation even at this time to allow an adequate measure of this statistic. If the population is to be hunted it is important to measure recruitment accurately on an animal basis, but if unhunted, this becomes less vital.

Summer surveys are less costly than winter surveys because: (a) the search area is smaller, the former usually flown near the 2,000 m contour and the latter slightly above 1,800 m. (b) Ferry time is reduced with less winter gear aboard and fuel caches more readily established. In this survey, ferry time (including trips to and from Kamloops) consumed 32% of the flying time. The total search time of 13.5 hours in this survey compares to 9.0 hours in the successful 1970 summer survey, or an increase of 50% of search time.

## MANAGEMENT CONSIDERATIONS

Continued erosion of caribou habitat through logging outside the Park and decline of populations associated habitat under attack will contribute to the importance of Wells Gray's caribou herd as a wildlife resource. Therefore, population size must be monitored on a regular basis to establish the size or value of this resource.

An inventory schedule of once every three years would be adequate to monitor population size provided the population is unhunted. Inventory should be co-ordinated with that carried out by the Wildlife Branch on ranges adjacent to the park. At present, late winter is the preferred inventory period because success is less weather dependent. However, summer inventory should not be completely ruled out because there are obvious cost advantages.

Hunting the Park's caribou at present would probably not produce benefits commensurate with the risk of depressing the population and the cost of carrying out inventory plus administration of the hunt. However, should the population regain the level (circa 300) of the late 1960s, it would be worthwhile to consider the re-opening of the hunting season. If the season were re-opened, an annual census of the population should be instituted to establish proper harvest rates.

REFERENCES:

Antifeau, T. D. (1980) - North Thompson River Mountain Caribou Study, a progress report to the B.C.Fish and Wildlife Branch, April 1980.

Bergerud, A. T. (1978) - The Status and Management of Caribou in British Columbia. Fish and Wildlife Branch Report, March 1978.

Bergerud, A. T. (1976) - The annual antler cycle in Newfoundland caribou. Can. Fld. Nat., 90 (4) 449-463.

Jones, G. W. (1984) - Memorandum re. Wells Gray Park Wildlife Surveys. Parks Branch, February 9, 1984.

Seip, Dale and Hebert, D. (1984) - Quesnel Highlands Caribou Research Project, interim report, August 1984.

Simpson, Keith, and Hebert, K. - Critical Habitats of Caribou in the Mountains of Southern British Columbia - in prep.