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# COMPOSITION AND HARVEST OF THE PORCUPINE CARIBOU HERD

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Project Progress Report  
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PROGRESS REPORT (RESEARCH)

State: Alaska

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Project No.: W-17-11                      Project Title: Big Game Investigations

Job No.: 3.23R                              Job Title: Sex/Age Composition and  
Annual Harvest of the  
Porcupine Caribou Herd

Period Covered: July 1, 1978 to June 30, 1979

SUMMARY

Initial calf production and survival in the Porcupine Herd were relatively high in 1978, approximately 67 calves:100 cows. Available data suggest that survival of calves to fall was excellent. However, only a small portion of the Porcupine Herd, from a single geographic area, was sampled for sex/age composition in fall 1978; these data do not appear to be representative of the entire herd, although they do agree with counts obtained in the same general area the previous year. Composition data should be gathered from a large proportion of the herd or from several areas of the herd's range.

Hunters residing outside the range of the Porcupine Herd in Alaska harvested a minimum of 48 Porcupine caribou in the 1978-79 season. Harvest by local village residents was 700-800 in Alaska and no more than a few hundred caribou in Canada.

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## BACKGROUND

LeResche (1975b) presented a thorough discussion of the history and status of the Porcupine caribou (*Rangifer tarandus granti*) herd, including reviews of information from early explorers and native inhabitants of the area, present and future values of the herd, existing population data, and possible impacts to the herd from impending resource developments. Data on movements, distribution, and summer sex/age composition of the Porcupine Herd have been gathered yearly since 1971 (Calef and Lortie 1973; Roseneau and Stern 1974; Roseneau et al. 1974; LeResche 1975a, 1975b; Roseneau et al. 1975; Roseneau and Curatolo 1976; Surrendi and DeBock 1976; Russell 1977; Bente and Roseneau 1978; Davis 1978). Herd size was estimated by the aerial photo-direct count-extrapolation (APDCE) technique (Hemming 1972) in 1972 and again in 1977 (LeResche 1972, 1975a, 1975b; Calef and Lortie 1973; Roseneau and Stern 1974; Bente and Roseneau 1978; Davis 1978). Fall composition data were collected in conjunction with the 1972 and 1977 censuses.

From Statehood to 1976 there was no closed season, no bag limit, and no close monitoring of harvest of the herd in Alaska. Since 1 July 1976, hunters transporting caribou south of the Yukon River have been required to file harvest reports, thus providing a means of assessing harvest by hunters residing outside of the range of the herd. Various survey methods have been used to estimate local harvest by village residents in Alaska (Reynolds 1978, Davis 1978).

## OBJECTIVES

To determine the sex and age composition of the Porcupine caribou herd during midsummer and fall, and to assess the annual harvest of the herd within Alaska.

## PROCEDURES

### Sex and Age Classification

In late June, post-calving aggregations were located using a Cessna 180 and PA-18-150 Super Cub in the Arctic Slope portion of the Arctic National Wildlife Range (ANWR). Sex and age classification counts were subsequently made between 30 June and 1 July using a Bell 206B helicopter. Whenever possible, counts were conducted from the ground by experienced observers using tripod-mounted scopes and tally registers. However, even though large numbers of caribou were located, their movements were unpredictable, and efforts to place observers in front of moving caribou were frequently unsuccessful. It also proved difficult to land and approach caribou on foot. Consequently, about two-thirds of the summer classification counts were made directly from the helicopter by making brief, low passes at a distance of approximately 50 m. Binoculars were used to aid in identification from the air, thereby maximizing approach distances. Criteria for sex and age classification were those suggested by Skoog (1968).

Fall classification surveys were conducted on 27 October in the Junjek, East Fork of the Chandalar, and Christian River valleys in the vicinity of Arctic Village. A Helio Courier aircraft was used to locate caribou groups, and counts were again made directly from the helicopter.

Biologists from the Yukon Game Branch conducted summer classification counts in the Canadian portion of the herd's range, but fall composition was not determined in the Yukon.

### Harvest and Hunting Pressure

Harvest and hunting pressure in Alaska were estimated through the return of "Arctic Caribou Harvest Report Cards" which are required for the transport of caribou outside of Game Management Units (GMU) 25 and 26C. Local harvest by Kaktovik and Arctic Village residents was estimated by ANWR personnel through village contacts and interviews. The 1978-79 harvest by other villages in the Porcupine Herd range in Alaska was not recorded.

## FINDINGS AND CONCLUSIONS

### Post-Calving Sex and Age Composition

No attempt was made to assess population size in 1978. Consequently, we did not await maximum post-calving aggregation before initiating classification counts. Results of classification counts from Alaska and the Yukon are listed in Table 1 along with the mean of values reported for 1972-77. The 1978 counts in Alaska included relatively fewer bulls and yearlings and relatively more calves than the means shown for 1972-77. The 1978 calf:cow ratio in Alaska was especially high; in the Yukon Territory, bulls and yearlings were more numerous, and the calf:cow ratio was lower. The combined 1978 data are not directly comparable to

Table 1. Sex and age composition of the Porcupine caribou herd during post-calving (i.e. first half of July).

Source	Cows		Calves		No. Calves: 100 Cows	Yearlings		Bulls		Total No.
	No.	Percent	No.	Percent		No.	Percent	No.	Percent	
1978-Alaska	6053	54	4490	40	74	523	5	80	1	11,145
1978-Yukon <sup>a</sup>	2597	35	1289	17	50	1052	14	2585	34	7523
1978-Combined	8650	46	5779	31	67	1575	8	2665	14	18,668
1972-77 Mean <sup>b</sup>	--	50	--	30	55	--	7	--	8	--

<sup>a</sup> Data from J. Russell, Yukon Game Branch.

<sup>b</sup> From Davis (1978).

the 1972-77 means because the Alaska counts were completed before the adult bulls and yearlings had joined the post-calving aggregations; the Canadian results included many bulls and yearlings not normally present in post-calving migrations. However, despite these probable biases, the calf percentage and calf:cow ratio shown for the combined 1978 count were still much higher than the 1972-77 mean, indicating unusually high calf numbers in the herd. In 1978 calf production was also very high in the Central Arctic (Whitten 1979) and Western Arctic Herds (Davis et al. 1979).

#### Fall Sex and Age Composition

Because no fall classification counts were conducted in the Yukon, the only data available are those from Alaska. The 1978 fall composition data are very different from the data of previous years (Table 2). Even allowing for annual differences in calf production and yearling recruitment, there are few similarities. However, the results of fall composition counts for 1977 and 1978 for the area southeast of Arctic Village agree closely (Table 3). Thus, while sex and age composition of geographic isolates are not necessarily representative of the entire herd, overall group composition in a given region may remain reasonably consistent from year to year. Mean composition given for 1977 (Table 2) probably most accurately reflected herd status as it was based on large samples from three different count areas.

The close agreement of fall and combined summer counts for 1978 (Tables 1 and 2) is probably coincidental. The low proportion of bulls (ca. 15%) and the low bull:cow ratio observed (ca. 32:100) are not reasonable and do not reflect the actual composition of the herd. However, the fall 1978 calf:cow ratio (62:100) indicates excellent calf survival; the decline in the ratio relative to midsummer may, or may not, be real.

#### Harvest

Annual harvest of the Porcupine herd (U.S. and Canada combined) has previously been estimated at less than 5,000. The 1978-79 open season in Alaska was 1 July-1 March, with a bag limit of five caribou, no more than two of which could be transported from GMU 25 or 26C. "Arctic Caribou Hunter Report Cards" were required for such transport; 477 tickets were issued, presumably to "out-of-Unit" hunters. Of 252 individuals returning tickets, 178 did not hunt, 28 hunted but were unsuccessful, 37 were successful, and 5 actually hunted outside of the applicable Units. Forty-three individuals reported hunting in GMU 25; of 25 successful hunters, 16 took one caribou each and nine took two caribou each for a total kill of 34. Twenty people reported hunting in GMU 26C; 12 were successful: 10 took one caribou each and two took two caribou each for a total kill of 14. Thus, the aggregate harvest by "out-of-Unit" hunters was a minimum of 48 caribou.

Resident hunters not transporting caribou out of GMU 25 or 26C were not required to file harvest reports. U.S. Fish and Wildlife Service personnel estimated that Kaktovik residents killed 75-90 caribou and Arctic Village residents took 300-600 caribou. These estimates may be

Table 2. Sex and age composition of the Porcupine caribou herd during fall (October, early November).

Date	Cows		Calves		No. Calves: 100 Cows	Yearlings		Bulls		Total No.
	No.	Percent	No.	Percent		No.	Percent	No.	Percent	
1972 <sup>a</sup>	1461	49	443	15	30	257	9	836	28	2997
1977	3487	39	1657	19	48	1089	12	2707	30	8940
1978 <sup>b</sup>	474	49	295	30	62	60	6	151	15	980

<sup>a</sup> Data collected by G. Lortie (cf. LeResche 1975b).

<sup>b</sup> From Davis (1978).

Table 3. Fall sex and age composition of the Porcupine caribou herd from count areas southeast of Arctic Village.

Date	No. Bulls: 100 Cows	No. Yearlings: 100 Cows	No. Calves: 100 Cows	Percent Yearlings in Herd	Percent Calves in Herd	Percent Cows in Herd	Percent Bulls in Herd	Total Sample Size
1977 <sup>a</sup>	31.2	20.8	50.8	10.2 (54)	25.0 (132)	49.3 (260)	15.4 (81)	527
1978	31.9	12.7	62.2	6.1 (60)	30.1 (295)	48.4 (474)	15.4 (151)	980

<sup>a</sup> From Davis (1978).

Note: Sample size is shown in parentheses.

somewhat low, but it is improbable that Kaktovik residents harvested more than 100 caribou or that Arctic Village residents killed more than 700 caribou. The take by other Alaskan villages in 1978 is unknown, but is thought to have been very small.

Porcupine caribou did not winter close to villages in the Yukon or Northwest Territories and the total Canadian harvest was no more than a few hundred (John Russell, pers. comm.). Therefore, the total 1978-79 harvest of the Porcupine Herd was certainly less than 2,000.

#### RECOMMENDATIONS

The Porcupine caribou herd should be censused in midsummer 1979 using the modified APDCE technique described by Davis et al. (1979). This method involves direct aerial photo counting of post-calving aggregations and aerial photo or visual counts of peripheral groups, combined with simultaneous systematic and random samples of the entire range of the herd. Problems of geographic bias resulting from sexual segregation in fall are thus avoided. A more reliable estimate of herd size and composition, with tighter confidence limits, should be possible with less total effort and expense than the current dual method of calving ground counts and extrapolation from fall composition.

Local subsistence harvest should be monitored more closely through village recorders.

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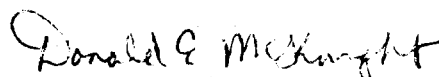
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