ATUS OF WOODLAND CARIBOU ND MOOSE POPULATIONS NEAR EY LAKE IN NORTHERN SKATCHEWAN

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skatchewan Parks, Recreation and ure (SPRC) recently initiated an in- ory program to determine the status Woodland Caribou and Moose in t habitat, north of the Churchill system. Traditionally, these far hern habitats were thought to sup- lower caribou and Moose densities other parts of the province but out inventory data it has been dif- to document current levels or term population trends.[1,2]

ring the 1987-88 winter an aerial y technique was used to obtain ty, sex-age structure, distribution abitat use information on caribou Moose populations near Key Lake. Key Lake area was considered rep- tative of most forest habitat north Churchill River and comparable fe inventory data was available a 1976 aerial reconnaisance com- d by Beak Consultants Ltd (BCL).[10]

Area

2380 km² survey block is located ximately 70 km southeast of Cree Fig. 1). The topography of the area dulating with an interspersion of hills, rock ridges and lake-filled ssions, draining in a northeast tion through the Geikie and ler Rivers. The predominant vegetation is Jack Pine (*Pinus iana*) with Black Spruce (*Picea na)* and some Tamarack (*Larix a).*[10] Jack Pine and Jack Pine-Black stands vary in height up to 15 meters. Recently burned areas located south and west of Key Lake consist of regenerating Jack Pine less than 5 meters in height. Treed and semi-open muskeg, dominated by stunted Black Spruce and Tamarack, occur around most of the smaller lakes and drainages. The Jack Pine-Black Spruce forest understory consists predominantly of dwarf shrubs including Canada Blueberry (*Vaccinicum myrtilloides*), Bog Cranberry (*Vaccinium vitis-idaea*), Labrador Tea (*Ledum groenlandicum*) and various lichens (*Cladina* spp.). Various mosses (*Sphagnum* spp.), lichens and sedges (*Carex* spp.) comprise the treed muskeg understory.

Methods

The aerial survey was flown between 8 and 11 January 1988, along east-west transects 70 km in length and at 2 km intervals using a Bell 206 Jet Ranger helicopter (Fig. 2). The helicopter with pilot and navigator/data recorder and 2 observers maintained an altitude of 120 m and a ground speed equivalent to 120-140 km/h. Two flight periods totalling 4 h, were flown each day from 1000 to 1200 h and 1400 to 1600 h, weather permitting. Approximately 25 cm of snow cover with fresh snow 2 days prior to the survey, occasional slight overcast, -30 to -37 C temperatures and 5 to 20 km/h winds provided good to excellent visibility during all flight periods.

Caribou and Moose activity was distinguished by track and behavioral

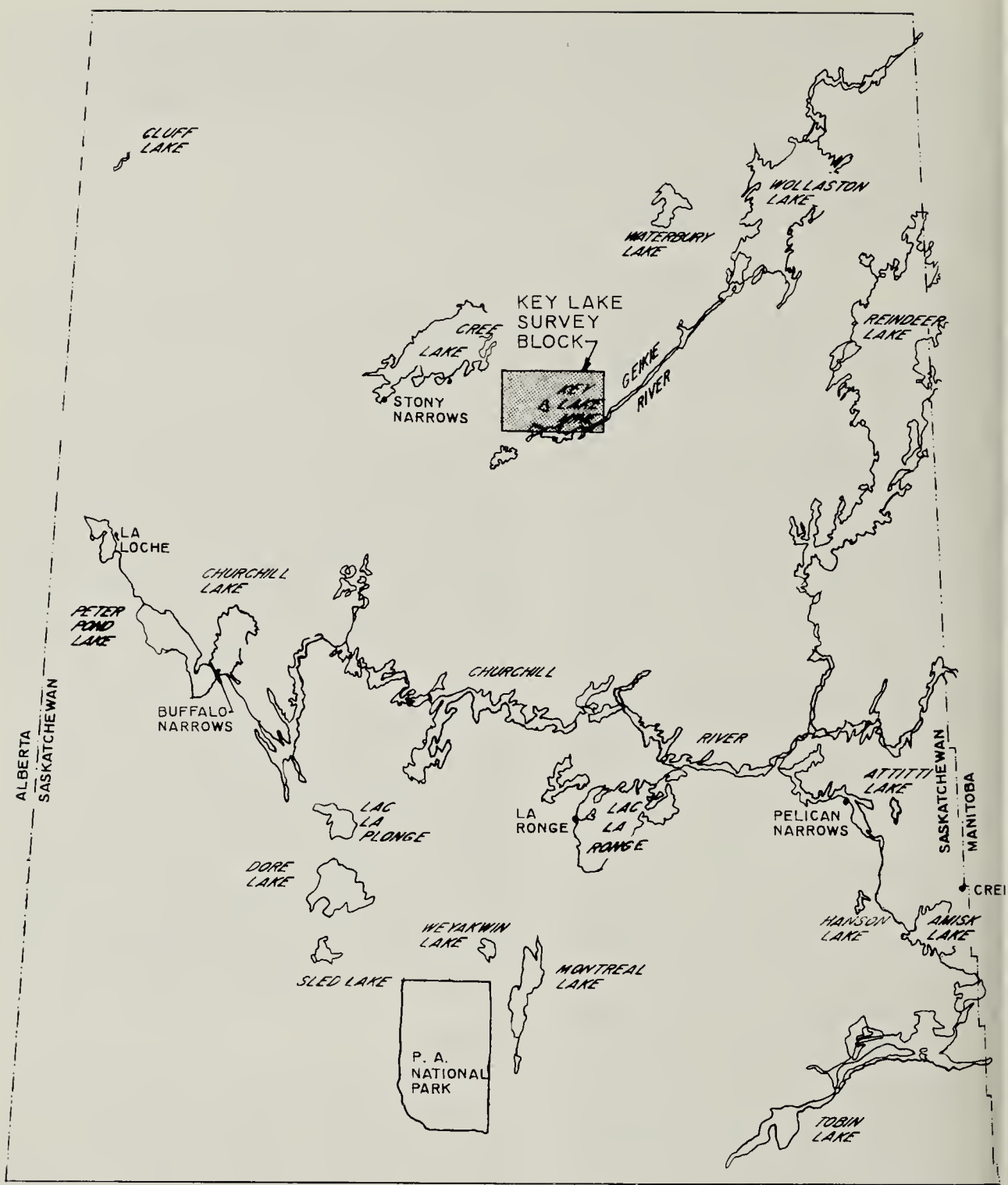
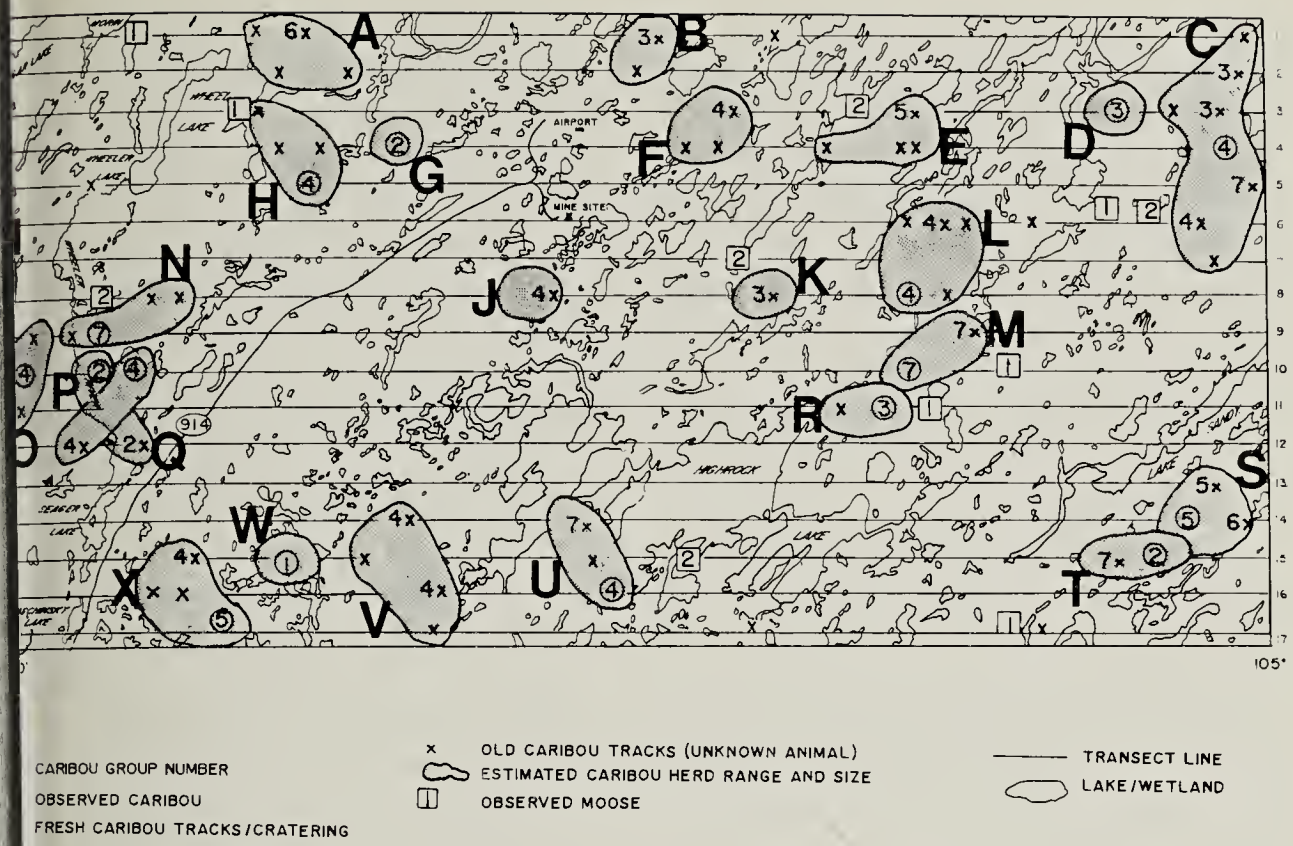


Figure 1. *Location within Saskatchewan of the Key Lake aerial survey bloock*

characteristics. Caribou sign was recognized by the presence of cratering and their tendency to walk in straight and parallel lines on lakes and lift their feet clear or swing them in wide sweeps in shallow snow.[5] Moose left larger tracks, usually in singles or pairs, in the snow. Moose also tended to walk in erratic patterns and drag their feet from step to step in shallow snow. The dominant forest cover type in which the animals were located or had displayed some activity was recorded.

Relatively fresh caribou tracks followed by the helicopter, somet up to 4 km off the transect line, animals were observed or it coul determined that the tracks were made within the last 24 to 48 h pe Old tracks were usually filled i drifting snow and could be follo only for short distances. Although t often overlapped with caribou sig other transect lines the tendenc caribou to travel from one lak another on the ice allowed observe



e 2. *Distribution of Woodland Caribou and Moose observed near Kay Lake rthern Saskatchewan during January 1988.*

tor individual herd movements. animals were generally observed cratering sites or where numerous s indicated that the animals were ering at random with no specific tional heading. In situations where ou were not directly observed, the nce and number of animals were ated from cratering and fresh track ty. Caribou were difficult to ob- in dense forest cover and in l instances, the observers felt con- that caribou were present but y were not visible from the opter. Observed caribou were d with the helicopter and sex and termined from body size (calves), size (mature bulls) and presence ark colored vulva patch on the e cows. To observe the vulva it was necessary to herd the u with the helicopter out into areas or onto adjacent lakes for short periods of time. Caribou tend to elevate their tails when alarmed and this trait facilitates the observation of the female external genitalia.[2]

Moose were counted only within 0.4 km of the transect line. Tracks were used to alert observers to animal activity but because tracks were not investigated with the helicopter while on transect, the population for the survey block was extrapolated from animal observations with a 30% observer miss-factor included in the estimate.

Results

Population Density

Seventeen groups of Woodland Caribou, including 18 bulls, 34 cows and 11 calves (total 63), were observed during the aerial survey (Table 1). Another 23 activity areas were identified either by an abundance of fresh

tracks or cratering activity but no animals were observed. Tracks were routinely observed between cratering sites indicating that some of the activity was caused by the same group of animals. Based on actual caribou observations and the occurrence of activity areas where caribou were not observed but believed to be present, it was estimated that 25 groups of caribou totalling 102 animals resided in the survey block for a density of 0.04 caribou/km^2 or 1 caribou/23 km^2 (Table 2). These densities were 33% higher than reported by BCL on their Key Lake study area in December 1976.[10] The December 1976 survey represented the highest caribou estimate derived from 3 density surveys conducted by Beak during the 1976 to 1978 period.

Aerial surveys conducted by S using a similar survey design prov density estimates for caribou pop tions south of the Churchill River. Ba on early winter surveys flown in 19 87 on treed muskeg-coniferous hal in the Weyakwin (La Ronge), Har Lake (Creighton) and Attitti L (Pelican Narrows) areas, thought to resent some of the best caribou ha in Saskatchewan, only the Hanson L area had higher densities than Key L (Fig. 1 and Table 2).[11] The Key L caribou densities were also simila estimates of 0.04 animals/km^2 repo from northern Ontario and northeas Alberta, exceeded densities of animals/km^2 from west central Alb but were lower than 0.07 animals estimate from Ontario's Lake Nip area.[13 9 8 5]

Table 1.SEX-AGE COMPOSITION AND ESTIMATED GROUP SIZE OF WO LAND CARIBOU OBSERVED NEAR KEY LAKE IN NORTHERN SASKATCHEV DURING JANUARY,1988

Group	Number Observed Caribou				Activity	Estima
Number	Bulls	Cows	Calves	Total	Areas	Group
A	--	--	--	--	1	
B	--	--	--	--	1	
C	1	2	1	4	5	
D	1	1	1	3	1	
E	--	--	--	--	1	
F	--	--	--	--	1	
G	--	1	1	2	1	
H	1	3	--	4	1	
I	--	2	--	2	1	
J	--	--	--	--	1	
K	--	--	--	--	1	
L	2	1	1	4	2	
M	2	3	2	7	2	
N	3	3	1	7	1	
O	--	3	1	4	2	
P	--	2	--	2	2	
Q	--	3	1	4	2	
R	1	2	--	3	1	
S	2	2	1	5	3	
T	1	1	--	2	2	
U	2	2	--	4	2	
V	--	--	--	--	2	
W	--	1	--	1	1	
X	2	2	1	5	2	
Y	--	--	--	--	1	
Total	18(29%)	34 (54%)	11(17%)	63	40	1

hteen Moose (5 bulls/6 cows/5 calves unknown sex) in 13 groups were rved during the transect portion of urvey (Fig. 1). Based on observed als and including a 30% observer factor, the population on the surblock was estimated at 60 animals density of 0.03 Moose/km² or 1 e/40 km². BCL reported a density 01 Moose/km² during their December 976 survey, suggesting that the Key Moose population has tripled in ast 12 years.[10] Barber et al reported ly higher winter densities of 0.04 11 Moose/km² in the Churchill area, east of La Ronge.[1] Densities forest areas, south of the Churchill River system, range from 0.04 to Moose/km² and are considerably r than densities at Key Lake.[12]

ation Structure

and age classification of caribou vely identified indicated a population structure of 53 bulls/100 cows/32 (Table 2). The calf:cow ratio was than that observed at Attiti Lake, as similar to production indices he Hanson Lake and Weyakwin reas.[11] Calves comprised 17% of served population, similar to or e instances higher than calf crops % to 20% in southeastern ba and 12% in northeastern Al- [5] Bergerud suggested that u populations with more than alves in late winter were increasereas those with less than 10% were in decline.[3]

The ratio of 53 bulls/100 cows observed at Key Lake was higher than bull:cow ratios reported from the Hanson Lake and Weyakwin Lake areas but similar to ratios observed on the Attiti Lake area. Slightly higher bull:cow ratios were reported in Alberta but Bergerud indicated that the sex ratio in most caribou populations, whether hunted or not, should exhibit a preponderance of cows.[9 3]

Of 31 cows observed at Key Lake, 87% were antlered, similar to 92% and 76% antlered cows observed during early winter surveys in Alberta and Manitoba, respectively.[9 6] Only 69% of 16 bulls segregated at Key Lake were antlered and approximately half of the antlers were small, similar in size to those exhibited by cows, suggesting that both mature and immature bulls were being observed. Fuller and Keith suggested that during the winter mature bulls do not associate with other sex-age groups but at Key Lake the presence of large antlered males observed with immature male, cow and calf groups indicated that some mature bulls do remain with the main herd during the early winter period.[9]

The average caribou herd size of 3.7 animals/group, ranging from 1 to 7 animals, was slightly larger than the mean herd size of 3.3 caribou/group observed by BCL, but maximum group size was smaller (Table 2).[10] Mean group size ranged from 4.3 to 6.8

2. ESTIMATED DENSITIES, GROUP SIZE AND HERD STRUCTURE FOR LAND CARIBOU POPULATIONS IN NORTHERN SASKATCHEWAN

	Population Size	*Group Size*		*Population Structure/100 Cows*		
	Animals/km²	*Mean*	*Range*	*Bulls*	*Calves*	*#Animals*
ake	0.03	6.8	4 - 13	60	10	27
Lake	0.05	5.6	3 - 13	33	33	45
e (BCL)	0.03	3.3	1 - 13	-	-	44
e (1988)	0.04	3.7	1 - 7	53	32	63
vin Lake	0.02	4.3	1 - 8	39	27	57
Park	-	3.8 - 4.2	-	-	-	-

caribou/group on the Attiti, Hanson and Weyakwin Lake survey blocks with a maximum of 13 animals in one herd.[11] Slightly larger average group sizes of 3.8 to 4.2 caribou were observed during January 1978 surveys at Prince Albert National Park in central Saskatchewan.[4] Other investigators reported small but seasonally fluctuating group sizes with mean winter herd sizes of 5.4, 5.5 and 8.6 caribou/group.[9,7,5] Large winter herds of 65 caribou have been observed in Ontario but these herds were comprised of smaller subgroups.[5]

Smaller herd sizes observed at Key Lake may be partially due to the homogeneity of the habitat and shallow snow depths. Preferred habitat was readily available to individual herds and snow depths were considered below average for the Key Lake area at the time of the survey. In Manitoba, caribou aggregations were smaller and caribou travelled more extensively in winters with thin snow cover.[14]

Classification of 16 Moose observed during the survey indicated a herd composition of 83 bulls/100 cows/83 calves. Groups ranged from 1 to 3 Moose for a mean herd size of 1.5 animals. Both calf/cow and bull/cow ratios were considerably higher than ratios reported from southern forest areas but sample sizes were small and may not be representative of the true population structure.[12]

Geographic Distribution

Track, cratering and animal observations indicated that caribou were highly mobile, ranging 2 to 12 km in distance since fresh snow cover 2 days prior to the survey period. The movement was in a north-south or east-west direction following general topographic features such as Jack Pine ridges, drainages that connected lakes and treed muskegs. In December 1976, BCL found that caribou followed a broad zone dis tion from the southwest to nort part of the survey block with animals and activity observed o west side of the survey block. though the 1988 survey cover slightly smaller area, extending fa east and west but not as far north a 1976 survey, caribou appeared to a wider distribution. At least 12 g 25 groups of caribou estimated to r in the survey block were located o east side of the survey block. Ca located on the west side of the su block were in approximately the areas as observed during the 1976 vey. Several caribou herds were lo within 4 km of the Key Lake min access road and caribou tracks observed crossing the main access at 6 locations (Fig. 2).

Although the Key Lake caribou probably mix or travel with each from time to time, particularly d the fall and early winter months, herds were located 2 to 10 km each other during the survey. herds on the east side of the s block (herd C, S and T; Fig. 2) app to join together and separat casionally based on track observa and it was difficult to designate th separate groups.

Moose were observed throughou survey block, similar to observa made by BCL during the 1976 su Animals appeared to be distri uniformly throughout similar h types.

Habitat Use

During the survey, 44% of the ca observed were located in matur Pine stands adjacent to small lake plexes. The remaining animals found in treed muskeg (40%) an ture Jack Pine stands associated treed muskegs (16%). Moose ut

treed muskeg and Jack Pine burns pproximately equal proportions.

ck and cratering activity suggested the caribou traveled from lake to occasionally cratering for slush or king water and moving into treed kegs and Jack Pine stands to forage od. Heavy caribou utilization of nd lichens that grow in the relative- en canopy and sparse understory acteristic of mature Jack Pine stands lichens and sedges in treed mus- was reported for Manitoba.[6,14] Most ou herds utilized all the major at types although the duration of stay in each habitat could not be rmined.

ck and animal observations indi- d that caribou tended to avoid erating Jack Pine burns located tly south of the mine site and in the west part of the survey block. Low ation of recent burns was docu- ed in Manitoba because lichens ot had time to become established subsequently could not meet ou food requirements.[6]

lusions

odland Caribou were more abun- than Moose in the Key Lake area. ou populations exceeded den- observed during previous aerial ys between 1976 and 1978 but the ase was believed to be a function proved survey design. BCL, using d-winged aircraft, only included als observed within 0.4 km of the ct.[10] The improved visibility from elicopter versus a fixed-winged ft, flying following a fresh snow- earching for caribou activity off nsect line and circling caribou to ve all of the animals resulted in a accurate aerial survey in 1988. ou populations, therefore, may ave changed significantly in the ecade.

It appears, however, that the Key Lake area supports higher densities than some southern forest areas, previously considered the best caribou range in Saskatchewan. Based on occasional sightings of caribou and the abundance of mature Jack Pine-treed muskeg habitat north of the Churchill River, the densities observed at Key Lake may be indicative of other habitat in this part of northern Saskatchewan.[15] These densities also suggest that Saskatchewan caribou populations may be relatively high in comparison with other provincial jursidications.

The sex ratio and fecundity were similar to those reported for other caribou populations. There appeared to be sufficient recruitment to sustain and possibly increase current population levels. Early winter caribou herd sizes at Key Lake were smaller in comparison to most other jurisdictions but shallow snow depths and preferred habitat in close proximity to all caribou may have helped maintain small independent herds.

Caribou movements during the survey period appeared to be influenced primarily by topography and habitat type. The abundance of small lakes connected by natural drainages and surrounded by mature Jack Pine stands permitted caribou to travel long distances in a relatively short period of time while remaining in close proximity to predator escape and thermal cover. Mature Jack Pine stands and treed muskeg were heavily utilized probably because lichens and sedges were readily available as a daily food source. Habitat preferences were similar to those exhibited by other caribou populations. Forest fires will probably continue to influence caribou habitat use and distribution because most fires in this part of northern Saskatchewan are started by lightning strikes.

Although the survey indicated an increase in the Moose population, densities remain very low in the far northern regions of Saskatchewan. The abundant Jack Pine-spruce-Tamarack habitat north of the Churchill River is generally rated of lower quality for Moose than more productive southern mixed-wood and hardwood forest stands.[12] [10]The regenerating Jack Pine burns and treed muskeg used by Moose, probably supports some growth of deciduous browse species that, in the absence of hardwood forest cover, may have provided the only food source. The sex ratio, based on small sample size, suggested good recruitment and that the Moose herd was capable of sustaining population growth.

Acknowledgements

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e burn near Waterbury Lake, in northern Saskatchewan *Chris Adam*