CANADIAN WILDLIFE SERVICE

CARIBOU REPORT

A Report on Caribou Research carried out in Newfoundland during the summer of 1958 in conjunction with the Wildlife division of the Department of Mines and Resources, Newfoundland.

K.M. Sandilands

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ITINERARY

The writer arrived in St. John's, Newfoundland, from Ottawa on the 29th April, 1958. The following few days were spent in arranging food and equipment for a six-week trip into the bush for two men. Mr. Stephen Hall, Wildlife Supervisor, and the writer left Badger on the morning of May 5, and started up Red Indian Lake the same evening with two canoes. After a slow trip up this lake and the Lloyds River the proposed base camp, consisting of two cabins, was reached on the evening of the 8th.

Until the afternoon of the 16th, when Bergerud and Quinton arrived by plane, the time was spent getting to know the country. One- to three-day trips were made between King George IV Lake, Upper Victoria River, Lloyds Lake and the Annieopsquotch Mountains.

On the morning of May 17 camp was moved by plane to Stoney Lake from where work was continued until June 8. This work was concentrated on a herd of approximately 200 caribou in a wide valley containing an unnamed river flowing out of Stoney Lake.

On June 8 the equipment and personnel were flown to Buchans Mining town from where they made their way to Grand Falls to rendezvous with the other field party. The following morning Bergerud and the writer flew first to Louse Lake, where the pathologist, Dr. King, and Mr. Stuart Peters had set up a temporary laboratory. In the afternoon the same personnel were flown to Middle Ridge where the writer was left. A week was spent on this ridge with Mr. W. Carberry, Wildlife Supervisor, and Mr. E. Balsom, Wildlife Officer, to study the caribou herd in this area. On June 15 the writer was moved to Louse Lake to assist Dr. John King on the post-mortem work. The first phase of the summer's work was terminated on the following week-end when everyone returned to St. John's.

The writer arrived in Gander on June 29 to meet Mr. D. Quinton and both left next day for Dolland Brook. After the food and equipment for the next 20 days had been cached at two proposed camps, a 300-mile flight was made over the southern part of the island to find any large caribou concentrations. The party then returned to the food cache designated for Study Area I. Due to difficulties in finding a suitable landing area work was delayed four days in order to move the supplies into the study area.

The move to the second study area was begun on July 10. This area was located 22 miles north-east of area #1 and due to the slow walking conditions, and to the writer having to make the return trip for more equipment, only Quinton was able to accomplish any work in Study area 2.

On July 19 the camp was moved again, to Newfoundland Dog Pond, the third study area. The return to Gander was made on July 29 from where the party returned to St. John's. At the beginning of the next week a day was spent working out of Clarenville on plant collections before taking the train on to Buchans Mining Camp. Here, owing to inclement weather and other misfortunes, the writer remained until August 12th before returning to St. John's to prepare to leave the island on August 16th.

The following report is based on the observations of the writer and, between May 5 and June 8, Mr. Hall. It will be seen that no conclusions are drawn due simply to the short time spent in the field. Some observations were made during the calving study on a disease affecting the Newfoundland Caribou, but a report on this aspect is not included because it is expected to become the subject of a thesis by Mr. S. Peters. The work of the writer during the calving season was mainly concerned with classification and behaviour. Tables of classifications, calf measurements and weather conditions during the calving season are included at the end of the report.

HERD STRUCTURE

During the period of study there appeared to the writer to be no general pattern of herd structure. Groups of animals containing almost all conceivable combinations were encountered. Due to the low number of bulls in the areas under study this group was naturally less apparent, and

although few herds were seen which contained adult bulls, their absence did not appear to be necessarily due to voluntary exclusion. However the impression was gained that nuclei for herds during the parturition period were small groups of non-pregnant animals, either adults, yearlings, or both. Herds were seen, though, which were composed entirely of cows with calves.

Movement into and out of groups by individuals or smaller groups could not be assigned to any specific cause. The one exception to this entailed the cow and calf class which tended to come together and remain in groups after the calves were approximately 24-36 hours old. Instances were noted, however, in which a single cow and calf ran off together in one direction, while the remainder of the herd moved off in another, when disturbed by the observer. Generally when a large herd was disturbed the cows with calves were the first to move away and they usually did so as a group.

Non-pregnant animals, especially the yearlings, exhibited a behaviour similar to domestic sheep at the approach of an observer, namely they appeared confused as to whether to move away from, or get a close look at, the intruder. When they finally did move off they usually did so as a group.

BIRTH SITES

Due to the fact that no births were witnessed no times can be recorded. One birth site was found by Hall and the following notes were taken on it: Time about 1000 hrs. Located on a small barren knoll, approximately 200 feet in diameter, surrounded by low bog with several small ponds within a few hundred feet. Birth took place on a dry mossy hummock about 8 x 4 feet. Blood was apparent and the moss had been kicked or gouged out. There was another depression about five feet away where the cow had subsequently lain. Cow and calf had moved about 25 feet to another hummock on the same knoll. When disturbed the cow had about one foot of afterbirth hanging from genitalia. Calf was #9 and dry but showed 4 inches of wet umbilical. The nearest cover was about 100 yards away and cow led the calf towards this when alarmed.

Unfortunately no photos were taken of the birth site.

COW - CALF BEHAVIOUR

a) After measurement of the calf.

It is believed that of the 15 calves caught and released by Hall and Sandilands all were reunited with their mothers. Eleven of the cows remained within a radius of 100 yards while their calves were being measured and most of them remained much closer. The general pattern of behaviour of the cows was as follows: As soon as the calf had been caught the mother circled round, periodically stopping to face the calf and grunt. She would also grunt while circling especially if she heard any noise from the calf. One cow approached to within 10 feet of Hall and he had to resort to throwing sticks to keep her away. When the calf was released it either lay down or moved off, but in the latter case it would not necessarily move towards the cow. In either case if the mother could see it she immediately moved towards it, grunting. The amount of grunting seemed to be proportional to the amount of noise made by the calf! Instances were noted in which the calf became attached to the observer and would follow him when he moved away. In one case a calf became so attached to the writer that it ran from the mother and hid behind him. Three or four times the calf was laid down in view of its mother and then the writer tried to run away but each time the calf jumped up and gave chase while the cow ran, grunting, behind it. And each time the calf put the observer between it and its mother. The last time this occurred, instead of stopping a few feet away, the cow came on in to smell the calf and at this time she was within six inches of the observer. However, after sniffing the calf she turned and ran off about 20 yards. Luckily by this time the calf had become tired and lay down to rest and the opportunity to escape was taken. The mother immediately moved in, sniffed and grunted at the calf, and turned to leave. The calf got up and they both ran off together, the cow periodically stopping to allow the young one to catch up. At these times the cow would always take a reassuring sniff at the calf's nose.

In all except one of the previously mentioned 11 cases the calf was not allowed to suckle while the observer was still in view. Due to this, the distance that it was led before being nursed was not determined. The mother of calf #12 took it at least half a mile without sniffing it or allowing it to suckle. However calf #1, which was only a few hours old when found, was allowed to suckle after being led away about 20 yards. Both animals then moved away out of sight.

The mothers of four of the calves did not remain within the immediate vicinity of their young but three of them were known to have returned and led their calves away within a period of one half to two and a half hours. In the cases of calves #4 and #9 the mothers were seen to return and collect their young. Calf #13 was watched for half an hour after it had been measured and left lying down. During this time it did not move and the mother was seen only once. The observer left and returned two hours later at which time no trace of the calf was found. The mother of calf #8 would not come near to its young while the observer was present, even though the calf was standing in plain view. Twice the cow ran to within 40 yards before turning and running across a bog, over a knoll and out of sight. A reunion had not occurred by the time it became dark and the observer returned to camp. The spot was visited at 0800 hours next morning and the area searched but no sign of the calf was found.

One instance was recorded of the cow sniffing the calve's genitals before allowing it to suckle. Whether or not this is prerequisite could not be determined due to the fact that only one calf was seen to suckle.

The behaviour of the mother of calf #9 is worthy of mention at this point. This calf and #8 were caught together and their respective cows moved away to an adjacent knoll. When their examination was finished calf #9 moved off in the direction in which it had been chased - one which proved to be away from its mother. It was quite determined to continue in this direction so that it became necessary to chase it round in an arc so that it was again moving towards its mother. While being chased in this manner it came to a shallow boggy pond into which it floundered. It had difficulty in making progress due to the pond's soft bottom. (During this time calf #8 remained laying where it had been examined.) At this time both mothers ran over to the downwind side of the pond, neither knowing whose calf it was. Amost without hesitation one of the cows waded in to the calf, turned, led it out, and ran off without perceptibly sniffing it. The other cow made no move to check the identity of the calf but moved off in the other direction.

b) Communication and Recognition.

Communication by sight and sound has been recorded. Generally it is done by sound and most noise seems to be made by the cow. An undisturbed herd passing close by

was heard to emit quite a noise consisting of the snorts and grunts of the cows and the half goose - half crow-like call of the young. It was found that if a cow was lying down when she noted an intruder she immediately stoop up. This action alone was often enough to make the calf stand up in readiness to move away. If the intruder was still some way off the cow might turn and face him and urinate. Subsequently the cow would turn to grunt at the calf and move away. One instance was noted in which the cow was grazing and did not notice the observer approaching. The calf, which was lying about 20 feet away, did notice him, however, and it stood up. It made no noise but simply began to walk away. This attracted the cow's attention and she immediately looked around to see the cause for the calf's behaviour. At this point the observer was only about 40 yards away but crosswind. Both animals then made off at a fast trot.

Recognition and acceptance of its calf by a cow has been partially covered in the previous section. One instance which occurred on Middle Ridge is worth noting here. A cow with two calves was surprised at a distance of about 40 yards in a brake at the bottom of a slight depression. Both calves ran off with the cow, one calf was quite a dark brown while the other was almost white. After they had run about 200 yards the light calf began to hang back and finally stopped, looking back in the direction from which it had come. It was looking upwind towards the brake. Another cow then walked out of the brake without noticing the observer. The light calf then grunted and began running back towards the second cow, stopping three or four times to look at the observer. Finally it stopped about five feet in front of the cow (which had not moved, but grunted twice at the calf). The calf then continued on to the cow and began to suckle with no preparatory sniffing. Both animals then moved off in the direction of the herd.

c) Pattern of cow searching for calf

The percentage of cows which lose their calves while escaping from danger is not known. It is readily understandable that in the rush to get away from an intruder, especially where there are a number of cows and calves present, some animals will lose sight of their calves, and vice versa. When a herd has put enough distance between themselves and danger they stop to regroup and survey the

situation. At these times cows have been noted to rush about searching for their young. Numerous instances of this were noted by the observer but one will serve to illustrate the typical actions. A herd of 15 animals, including six calves, were disturbed on the west side of Middle Ridge. The herd took flight and ran about a quarter of a mile to the crest of a knoll before pausing to look back. On seeing that they were not being pursued they walked on over the knoll. In the meantime another small herd of eight animals had spooked close by but had run off in a different direction. One cow from the first group did not go on with the others but ran over to the second group apparently looking for a calf. When she found the calf was not with the second group she returned to the area in which the herd had been disturbed. She travelled at a fast trot, grunting all the while. The observer was hidden crosswind from her as she ran in and it was not until this time that the calf was noticed laying out in the open on a small hummock. The cow passed about 40 yards down-wind of it but seemingly did not see it. She stopped and then began zig-zagging about the area but was unable to locate the calf. This continued for about 15 minutes before the observer walked over to the calf. The calf, #17, was very young, possibly less than a day old, and had apparently been too weak to keep up with the herd in its escape.

d) Protective behaviour to normal and sick calves

In addition to the herding behaviour of cows with young calves, and their habit of being the first to disperse when the herd is approached, cows have been noted to exhibit other instances of protective behaviour. During the chase after calves #8 and #9 and their mothers the four animals remained very close together. It appeared that each cow was only interested in her own calf because in her preoccupation with its safety, she would run into and knock down the other calf.

An instance has been recorded earlier in which a calf was chased out onto a shallow bog and experienced some difficulty in making headway. When it paused in the middle of the bog its mother wasted no time in wading in and coaxing the young one out.

The habit of leading the calf out of sight of the observer after the young had been examined, and staying close by while the examination was taking place, are previously recorded instances of protective behaviour. However

these were all examples of human intrusion.

It is presumed by the writer that caribou have no fear of moose. An instance occurred in which two cow caribou were disturbed ran over to a nearby bull moose before the three moved away together. However, it is likely that both species go to some lengths to ensure that they are not in company, through mutual agreement more than fear for each other.

No instances were recorded of intrusion into caribou herds by other animals.

Another behavioural pattern was noted but whether it was protective or simply a displacement activity is debatable. During the examination of calf #12 the cow stayed within a 40-yard radius. During this time a bull, a cow in velvet, and a yearling came near to see what was going on. They stopped to watch from about 100 yards but when the mother saw them she rushed over towards them, grunting, and apparently chased them away. When they saw her coming they ran away and the mother returned to wait for her calf.

Protective behaviour towards sick calves was also seen. One instance of this occurred on Middle Ridge. The area was being flown by helicopter in an effort to obtain a good count of the herd there. A herd of eight cows and calves was buzzed and all but one cow and calf ran away. The calf was unable to rise and the cow stayed with it almost until the helicopter landed about 50 yards away. She then ran off in the direction taken by the others but stopped to watch after going about 200 yards. The calf was loaded on the helicopter and returned to base camp where it died about four hours later.

Another instance was noted, also on Middle Ridge, when a cow failed to rise and make off when approached to within 30 yards by the observer. The remains of a calf were then seen about 20 feet behind her. On approaching closer she got up and moved away, but subsequently returned to within 20 feet while the carcass was being examined. Only clean skin and bones remained of the calf, even the brain having been eaten out. Meanwhile the cow slowly moved away and was last seen walking along the ridge.

Cow caribou do not always remain near to their dead calves for a long period. A calf carcass was found with no adult in the vicinity. Death was thought to have occurred less than 48 hours previously, judging from the condition of the viscera. Death had taken place in open country and if an adult had been in the vicinity it probably would have been seen.

During the measurement of one calf by Hall the cow came so close to the observer that it was deemed advisable to throw sticks to keep her away. Whether or not she would have attacked is questionable. Caribou cows are certainly not as aggressive toward intruders as are cow moose. However caribou cows in Newfoundland stayed much closer to their calves, during examination, than do the barren-ground caribou.

e) Behaviour towards strange calves

No instances were recorded by Hall or the writer of two calves suckling the same cow. Two or three times two calves were seen following one cow for variable distances but in each case another cow appeared to claim one of the calves. Whether a herd was moving or resting, calves gambolled and chased each other amongst the adults, and at such times their paths would cross those of many lactating cows. In some cases the calves would attempt to suckle from any cow nearby but the adult would only walk a few paces and turn around, or, at worst, push the calf away with her muzzle. No instances were seen in which the cow actively pursued the calf although this may happen occasionally. Whether or not a cow, which had recently lost her calf, would try to induce another calf to suckle was not determined. This may happen if a cow is suffering from an extended udder.

CAUSES OF CALF MORTALITY

a) Predation:

Black bear, lynx and fox are the only predators which can have an appreciable effect on caribou numbers in Newfoundland. To what extent these animals are responsible for killing these ungulates is not known. Lynx and fox were reputed to be at their 'low' and only four black bears were seen by the writer during the whole summer. One lynx and no foxes were seen out of captivity.

(1) Black Bear: On May 26 a pregnant cow caribou was shot on the east side of Stoney Lake Valley. This was done to determine the stage of gestation. The animal was examined post-mortem and then the carcass, and that of the foetus, were left in the open. Stoney Lake Valley is a wide shallow valley consisting mainly of bogs and dry hommocky open country. The area was burned many years previously and the only trees present are those which missed the fire. The nearest trees to the carcass were about a mile northeast on the hillside.

The carcass of the cow was visited on May 26, 27, 28 and June 1, and during this time it had not been touched. On June 7 the carcass was revisited and a very large black bear was having a meal of spare ribs. The animal was approached to within 25 feet. There appeared to be nothing left of the caribou foetus and only the legs, vertebrae, pelvis, skull and part of the ribs remained of the cow. The bear was very fat in the belly and did not appear frightened by the observer. This obviously was not an act of predation and no instances were seen in which a bear was following or annoying caribou.

(2) Lynx: On June 11 calf #17 was caught and brought back to the camp on Middle Ridge. In the evening it was tethered just outside the tent and fed at 2030 hours. At midnight it started bawling for more food and the writer went outside to feed it. On leaving the tent a rustling was heard in the bushes close by but the flashlite failed to reveal anything. After feeding, the calf was brought inside the tent where it remained until its 0400 hour feeding. During the following day one man stayed in camp to feed the calf which was flown to the base camp that evening by helicopter. Next morning it was noticed that the wall of the tent, adjacent to where the calf had slept, was raised and lying on the Kalmia and rhodedendron bushes. Subsequently a fresh track of a large lynx was found in some mud about 20 feet from camp.

The only lynx seen during the summer was on Middle Ridge. It ran out of a small stand of bushes about 50 yards from a herd of caribou, but whether it was stalking these animals could not be determined.

(3) Fox: No foxes were seen all summer. However the carcass of a calf found on Middle Ridge was thought to have fox scats lying alongside it. Fox was incriminated in this case because the scats were about 4 cms. long, 1.5 cms. wide, and tapered at the ends. Lynx scats are said to be larger and clipped off on the ends. Once again it could not be determined whether this was a case of predation or of scavenging.

b) Death from other causes:

Drowning could occur not only in migration across lakes and rivers, but also in bog holes on the barrens. One case was seen in which a young calf had fallen into a

deep hole surrounded by stunted spruce and fir. Many of these bog holes have overhanging edges which make escape from them difficult. In the case referred to it would be doubtful whether an adult could have escaped. Only one case of what may have been river drowning was noted. The carcass of a three or four year old bull was found on a sandbar at the mouth of a small creek running into Lloyds Lake.

Broken limbs are thought to exact their toll of the herds. They could occur frequently in the small areas covered by small rocks and boulders. Only the relative lack of predators in Newfoundland would allow as many lame animals to persist as were apparent among the caribou herds. For instance, out of 126 animals seen from the ground on Middle Ridge six were limping on a fore or hind leg.

On June 7 a cow in the Stoney Lake Valley was seen with the two fore feet of a calf protruding from the vagina. This seemed to annoy her greatly. There was no way to determine how long she had been in this condition.

The above-mentioned causes of death are going to occur in any wild animal population and are only related here for their academic value.

RANGE STUDY

A month long range study was undertaken in July with Mr. D. Quinton but all results were turned over to him for compilation. Three study areas were proposed and plotted on aerial photographs. They were located in the caribou wintering ground, one being on Dolland Brook, a second about 22 miles northeast on an un-named lake, and the third on the east side of Newfoundland Dog Pond. It was proposed that the work consist of the following phases:

(1) Cover map all distinct areas that could be seen on a photograph (over one-eighth inch size).

(2) Line transects of all important plant communities.

(3) Determination of age of all burns.

(4) Species composition and per cent utilization from all important plant communities.

(5) Determination of pounds per acre of forage lichens.

Because the results of this study were turned over to Quinton for compilation only a superficial coverage will be given in this report.

For the cover maps the following types were used, most of which are self-explanatory:

> Upland tundra, base rock, tuck (stunted spruce and fir in large areas), close forest, lichen woodland, shrubby lichen woodland (a transitional type), high bog, low bog, rich sites, and alder thickets. In addition to these predetermined cover types, upland tundra - tuck was added in study area 1 where large areas of this transition type were present.

It was found to be impossible to obtain the percentage utilization of lichen communities as well as the accurate determinations of pounds per acre of forage lichens. The forage lichens were either wet or dry. If they were wet they were easily picked but enough soil was attached to affect the weight. If the lichens were dry, they were found to be too brittle to pick and many filaments broke off and were lost. If this determination is to be made in the future a better method will have to be employed.

Unfavourable weather and movement from one study area to the next limited the study to about 24 man-days for the entire month, of which 14 were spent in study area 3.

MOOSE

No moose counts were made during this study. These animals appeared plentiful and in good physical condition. However, the impression was gained by the writer that in the near future they will reach their peak populations and management policies should be initiated now with this in mind.

OTHER WILDLIFE

During the summer twenty-two ptarmigan were seen by the writer, including eight young. One of last year's nests was found containing eight eggs, of which one was addled.

No hares were seen and this dearth, together with the low number of ptarmigan, may account for the relative lack of lynx and fox sign.

A small population of Canada geese was seen in the Stoney Lake Valley. The highest count was a group of eith birds although it is thought that there were about two or three times that number in the area. Pairing of geese was definitely noticeable on the 25th May. Three pairs were seen on Middle Ridge with young, the broods being of four, four and six. In addition, a group of nine birds was seen in the same area on June 9 with no young.

Ducks were not numerous and the majority of those seen were American Golden-eye.

Table I. Classification of Animals seen before calving.

Area	Date	Bulls	Antlered Cows	Unantlered Cows	Cows in Velvet	Yearlings	Others
Flight							
Lloyds Lake to King George IV Lake	May 10			22 unidentified			7 Moose
Walk: King George IV Lake to Upper Victoria River	May 11	3	2	3	1		2♂) 1♀) Moose
Walk: Upper Victoria river to Lloyds river.	May 12 May 13	4		3	1		2♂) 2♀) Moose
Lloyds Lake	May 16	1	+ 60-70 unidentified				
Stoney Lake	May 17		94 unidentified				2♂) Moose
Stoney Lake	May 18	3	11	8			1♀) Moose
Stoney Lake	May 21		2	2		2♀	3♂) Moose

Table II. Classification of Animals seen after Calving began.

Stoney Lake Area

Date	Bulls	Antlered Cows calves	Antlered Cows no calves	Unantlered Cows calves	Unantlered Cows no calves	Cows in Velvet	Yearlings M	Yearlings F	Yearlings ?	Others
May 23	-	1	3	1	3	-	-	-	5	-
" 24	2	2	66	1	100	2	-	-	22	3♀ 2 calves Moose
" 25	-	-	22	-	45	3	-	-	15	-
" 27	4	1	9	6	13	3	-	-	4	2♀ Moose
" 28	4	9	15	11	48	3	-	2	2	-
" 31	4	4	1	13	7	4	-	-	2	-
June 1	7	5	4	36	8	10	4	1	11	-
" 2	6	1	-	-	4	6	-	1	1	♂ Moose
" 4	12	1	-	35	25	18	3	6	16	-
" 7	-	-	1	12	5	8	1	1	3	2 Beaks

Table III. Classification of Animals seen after calving began.

Middle Ride Area.

Type	June 9	June 10	June 11	June 12	June 13	Totals
Bulls	1			1		2
Barren ♀ n-a.	7	20	5	12		44
Barren ♀ a.		1				1
Barren ♀ v.			1	3	1	5
Fertile ♀ n-a.	14	55	11	27	12	119
Fertile ♀ a.			1			1
Fertile ♀ v.						-
2 yr. ♂						
2 yr. ♀		6		2		8
2 yr. ?						-
1 yr. ♂		1				1
1 yr. ♀						-
1 yr. ?					2	2
Calf ♂		1	1		7	9
Calf ♀	14	40	10		7	7
Calf ?				27	5	96
Moose	1♂ 1 yr♂					2
Lynx			1			1

n-a. = no antlers
a. = antlers
v. 2 velvet

Table IV - Measurements of calves caught in Stoney Lake and Middle Ridge Areas between May 23 and June 11, 1958.

Date caught	No.	Sex	Total Length	Tail Length	Shoulder Height	Chest Girth	Hind leg Length	Head Length	Head Width	Ear Length	Umbilical
May 23	1	♂	-	-	-	-	-	-	-	-	3" wet
" 24	2	♀	26	2¾	23	17½	13	8	6	-	1" wet
" 24	3	♂	29½	2½	22	17½	13¼	8	5¾	-	4" wet
" 27	4	♂	31½	2¾	24¾	18	13¾	-	-	3	6" wet
" 27	5	♂	30½	2¾	24½	17	13½	-	-	3¼	4" wet
" 27	6	♂	32½	2¾	24	17¾	14	-	-	3	-
" 27	7	♀	32½	2¾	24	16	13¼	7¾	6½	2¾	dry
" 27	8	♂	30½	2½	25	17¼	14	7½	6½	-	dry
" 27	9	♀	29	2¾	24½	18	14¼	8½	6	2¾	1" wet
" 28	10	♀	31¾	2¾	23¾	17	13	-	-	3	4" wet
" 28	11	♂	30	2½	24	17¼	13¾	8	7	2¾	dry
" 31	12	♀	32¾	2¾	25½	16½	14	8¼	6½	2¾	dry
" 31	13	♂	31	2¼	24	17	13¾	7¾	6	2¾	?" wet
June 1	14	♂	33¼	2½	24¾	16½	13½	7¾	6¼	2¾	dry
" 2	15	♀	33½	3	24½	16	13¾	7½	6	2¾	dry
" 10	16	♀	34¼	3	23½	17½	14¼	8¼	6½	3½	4" dry
" 11	17	♂	34¼	3¼	23	16½	13¾	8	6¾	3	2" wet
May 25	18	♀	32	1¾	24	15	14	8	6	2½	-
" 25	19	♀	63½	4½	41	-	23	15	9	-	-

#13 did not appear in good condition but no symptoms of disease were evident.
#15 had two cervical lesions, one open and one closed.
#16 was dead but death appeared to have occurred within 48 hours.
#17 was caught and flown down to base camp.
#16 & 17 were from Middle Ridge, all others from Stoney Lake area.
#18 was foetus from #19. Teeth were not yet through gums.
#19 was antlered doe shot in Stoney Lake area. Antler length: R-13" L-12½", widest spread 14", 3 spikes on both sides.
All measurements are in inches.

Table V. Weather Conditions May 5 - June 8, 1958
Stoney Lake

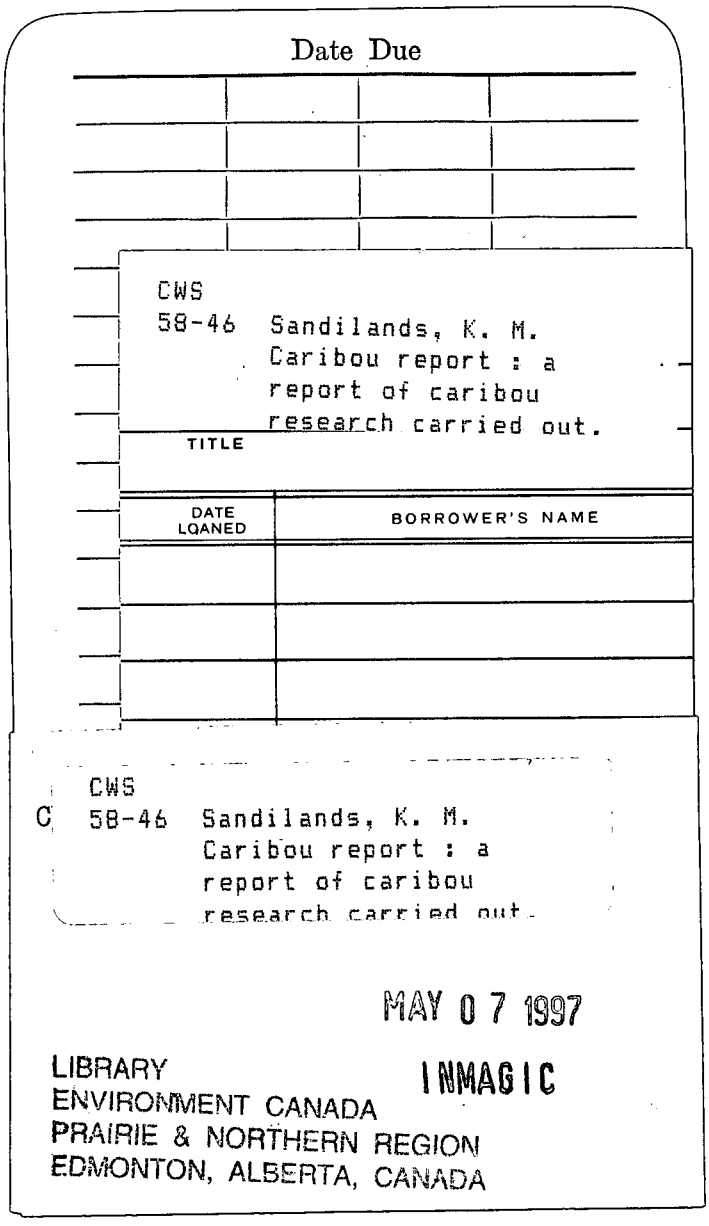
Date	Max. °F	Min. °F	Weather
May 5	-	-	Light S.W. wind, cloudy, sunny intervals.
" 6	-	-	Light S.W. wind, sunny, froze at night.
" 7	-	-	Sunny in morning, clouding over at noon.
" 8	-	-	Rained heavily in morning, intermitten showers in afternoon.
" 9	-	-	Rained heavily last night and most of morning, clouds broke up in evening.
" 10	-	-	Fog in morning and very heavy rain and hail in afternoon, cleared in evening.
" 11	-	-	Sunny and clear, strong west wind.
" 12	-	-	Sunny and clear, moderate west wind, froze at night.
" 13	52	30	Sunny and clear in morning, clouding lake with strong N.E. wind rising in evening.
" 14	43	32	Strong N.E. wind, cloudy with some snow and hail flurries.
" 15	52	26	Wind veered N., squalls quite strong, cloudy.
" 16	-	-	Clear and sunny, light west wind.
" 17	-	-	Clear and sunny, light S.W. wind.
" 18	64	30	Cloudy, sunny intervals, moderate S.W. wind.
" 19	46	40	Strong S.W. wind with rain all day, wind dropped in evening and fog came in.

Table V. (cont'd)

Date	Max. °F	Min. °F	Weather
May 20	54	43	Dense fog and intermittent heavy rain all day, S.W. wind veered to N.W. in evening.
" 21	58	50	Strong S.W. wind and cloudy, intermittent showers all day and steady rain in evening.
" 22	48	32	Strong S.W. wind and steady rain all day, cleared in evening.
" 23	57	38	Sky overcast and light S.W. wind.
" 24	72	41	Clear with light S.W. wind.
" 25	78	40	Warm and sunny, light S.W. wind.
" 26	55	41	Strong W. wind and rain all day.
" 27	65	32	Clearing in midmorning, wind veered to N.W.
" 28	66	44	Cloudy during day, moderate S.W. wind, rained all night.
" 29	56	47	Strong S.W. wind with rain all day.
" 30	57	37	Moderate S.W. wind, fog in morning, rain in afternoon.
" 31	59	49	Cloudy in morning, rain in afternoon, clearing in evening.
June 1	61	37	N.E. wind, dense fog till midmorning, clearing in afternoon, cold wind.
" 2	59	46	Dense fog in morning, clearing in afternoon, rained in morning and evening.
" 3	58	30	Rained hard all day but no wind.
" 4	62	26	Moderate N.E. wind and fog in morning, some snow flurries, clearing in afternoon.

Table V. (cont'd)

Date	Max. °F	Min. °F	Weather
June 5	68	27	Hot with very light N.W. breeze, clear sky.
" 6	46	30	Foggy with some rain, strong S.W. wind.
" 7	-	-	Clear and sunny, strong N.W. wind.
" 8	-	-	Clear and sunny, light N.W. wind.



Date Due

CWS
58-46 Sandilands, K. M.
Caribou report : a
report of caribou
research carried out.

TITLE

DATE LOANED	BORROWER'S NAME

CWS
C 58-46 Sandilands, K. M.
Caribou report : a
report of caribou
research carried out.