BEVERLY AND KAMINURIAK CARIBOU
MONITORING AND LAND USE CONTROLS, 1985

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ABSTRACT

The distribution, relative abundance and movements of the cow and cow/calf segments of the Beverly and Kaminuriak caribou populations were monitored from 20 May to 15 July, 1985. The objective of the monitoring program was to provide information about caribou distribution to Indian and Northern Affairs Canada (INAC) land use inspectors who enforced the 1985 Caribou Protection Measures.

Cows from the Beverly caribou population were approximately 200 km southwest of the Thelon Game Sanctuary in mid-March. By 21 May, Beverly cows had crossed the Thelon River, west of Beverly Lake and were within the Caribou Protection Area. Cows calved south of the Garry Lakes between Sandhills Lake in the east and an unnamed lake at 65°30'N, 100°20'W in the west. Post-calving aggregations were observed on 15 June. During the post-calving period, cows moved north to the south shore of Upper Garry Lake and Pelly Lake, and were west of the Caribou Protection Area by 2 July.

In April, Kaminuriak cows were distributed from Cullaton Lake in the west to the Maguse River in the east, south of Maguse Lake and North Henik Lake. By mid-May, the majority of cows were in the vicinity of Banks Lake and Blakely Lake in the Caribou Protection Area. Calving cows were observed on 4 and 5 June within an area extending from roughly 62°45'N, 94°27'W in the east, to Kaminuriak Lake in the west, Banks Lake in the north and Townsend Lake in the south. Post-calving aggregations were observed on 11 June. Post-calving cows moved southeast to Maze Lake and by 6 July, large groups of cows had moved south to the Maguse River, while others moved west towards Maguse Lake.

There were no active land use sites in the Beverly or Kaminuriak Caribou Protection Area. Cow caribou were not seen in the vicinity of land use sites outside the Protection Areas.

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INTRODUCTION

In 1978 Indian and Northern Affairs Canada (INAC) developed special land use permit conditions to protect the Beverly and Kaminuriak barren ground caribou populations (Rangifer tarandus groenlandicus). Initial studies by Darby (1978) and Interdisciplinary Systems Ltd. (1978) led to the delineation of Caribou Protection Areas which encompassed the calving grounds and immediate post-calving grounds of these populations. Since 1978, INAC has provided funding to the Government of the Northwest Territories (GNWT), Department of Renewable Resources, to monitor the spring and summer movements of the Beverly and Kaminuriak cows and calves (Darby 1980, Cooper 1981, Clement 1982, 1983, Bradley and Gates 1984, Bradley In prep.). The first five years of the Caribou Monitoring Program are reviewed by MacInnes (1982) and Mychasiw (1984).

In mid-May the 1985 Caribou Monitoring Program was initiated. The objective of this program was to provide INAC with information on the distribution and relative abundance of the cows and calves of the Beverly and Kaminuriak caribou populations. This information was used to facilitate enforcement of the 1985 Caribou Protection Measures (Appendix A), as well as to assist managers in delineating the Caribou Protection Areas. Boundaries of the Caribou Protection Areas were revised in 1985 to reflect those areas used by concentrations of cows during the previous 5 years (MacInnes 1985).

Caribou were monitored from 15 May to 15 July. The duties of the caribou monitor were as follows:

1) To advise INAC land use inspectors on matters relating to caribou protection.
2) To determine cow distribution relative to the Caribou Protection Areas, designated water crossing sites and land use sites.
3) To monitor and document the distribution and activities of the cow and cow/calf segments of the Beverly and Kaminuriak caribou herds during spring migraton, the calving and post-calving periods.

This report summarizes observations on caribou distribution and movements collected during the monitoring period. Information was obtained from caribou monitoring flights, GNWT biologists and other Renewable Resources staff, and from communication with local residents and pilots flying in the area. Information on land use activities within and adjacent to the Caribou Protection Areas is included in this report.

METHODS

The movements and distribution of the Beverly and Kaminuriak cow caribou were monitored from 21 May to 15 July, 1985. The monitoring area (Fig. 1) included the late spring migration routes, Caribou Protection Areas, calving grounds and early post-calving grounds of each population. Aerial surveys of the study area were conducted from fixed wing aircraft at an altitude of 300 m above ground level (Table 1). During the reporting period, the Beverly caribou population was monitored six times (Fig. 2) and the Kaminuriak population was monitored eight times (Fig. 3). Detailed reports of all flights are available from Indian and Northern Affairs Canada in Yellowknife and Rankin Inlet, NWT.

Non-systematic surveys were flown throughout the Caribou Protection Areas, over designated water crossings, and in areas of known caribou activity. Land use permit sites, claim areas and other areas of mineral interest (Laporte 1985) were also monitored. Under the Caribou Protection Measures, land use permit holders within the Caribou Protection Areas are required to have special approval to operate between 15 May and 15 July (Darby and Williams 1979). Permit holders with land use sites outside the Caribou Protection Areas also may be required to suspend operations if caribou are observed in the vicinity of these sites during the period 15 May - 15 July. Monitoring efforts were concentrated on the cow/calf segment of the populations, while bulls were monitored opportunistically.

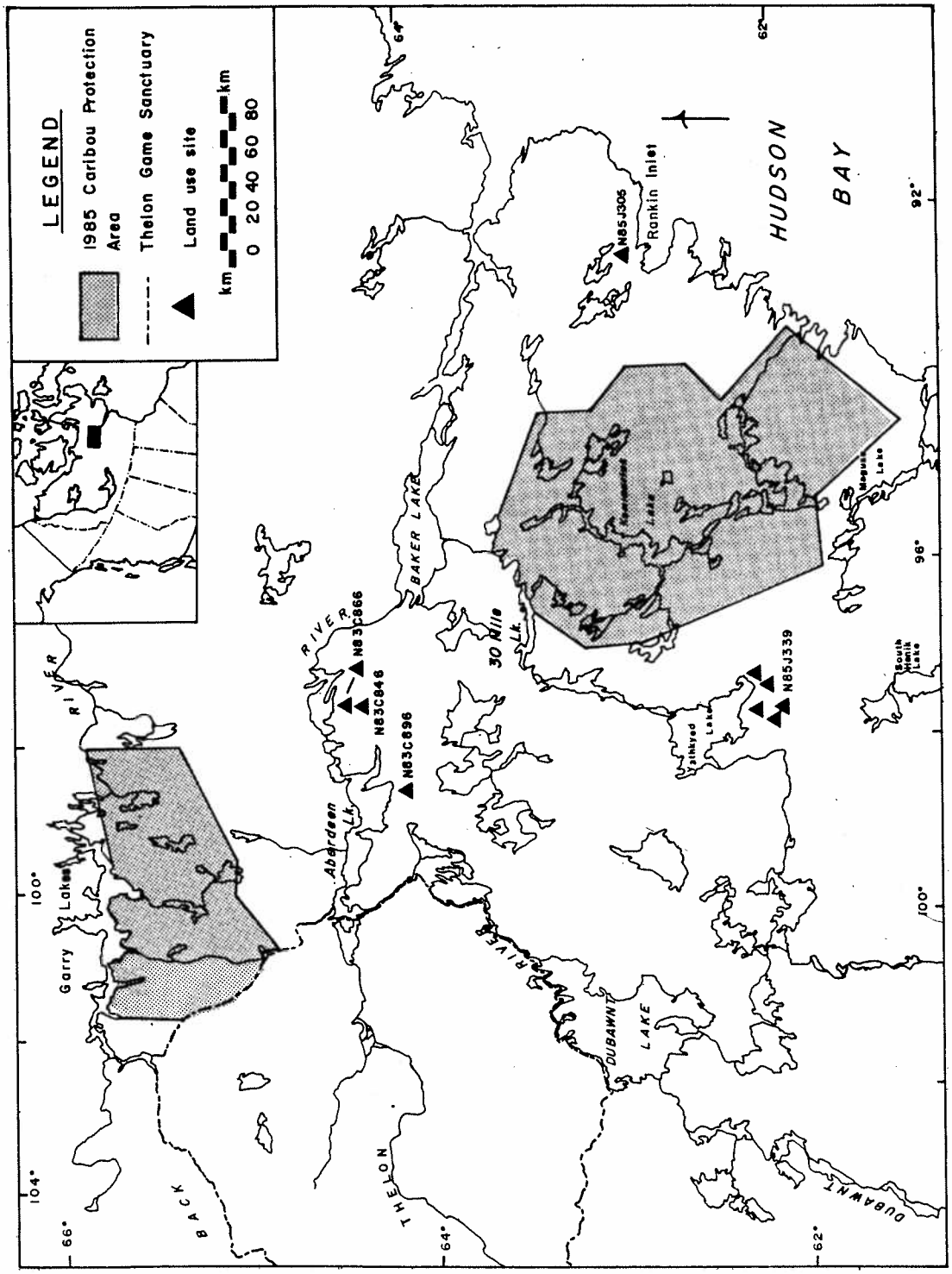

Figure 1. The 1985 Caribou Protection Areas.

Table 1. Summary of 1985 caribou monitoring flights, Beverly and Kaminuriak caribou populations.

Date	Hours	Population	Purpose
May 21	4.4	Kaminuriak	To determine cow caribou distribution relative to the Protection Areas and to document late spring migration routes.
May 22	10.6	Beverly	
May 30	6.2	Kaminuriak	Document cow/yearling distribution and survey the area around land use permit sites.
May 31	10.3	Beverly	Document cow/yearling distribution and survey the northern boundary of the Protection Area to ensure this marks the northern limit of cow distribution.
June 5*	5.5	Kaminuriak	To determine distribution of calving cows.
June 8	9.9	Beverly	To determine distribution of calving cows.
June 14	4.7	Kaminuriak	To delineate post-calving distribution of cows. to determine whether cows had calved along the NW border of the Protecton Area.
June 15	6.1	Beverly	To delineate post-calving distribution of cows. To determine whether cows were in the vicinity of SW border of the Proteciton Area.
June 21	5.0	Kaminuriak	To delineate the post-calving distribution of cows and check designated water crossings for possible use.
June 24	5.3	Beverly	To delineate the post-calving distribution of cows. To monitor land use sites south of Shultz Lake

Table 1. continued

Date	Hours	Population	Purpose
			and southwest border of the Protection Area for possible caribou activity.
June 28	5.6	Kaminuriak	To determine when cows and calves leave the Caribou Protection Area. To monitor caribou distribution in the vicinity of permited land use sites and areas of mineral interest. To check designated water crossings for use.
July 2	6.0	Beverly	To determine when cows and calves leave the Caribou Protection Area and to check for caribou in the vicinity of land use sites south of Shultz Lake.
July 6	5.2	Kaminuriak	To determine whether cows were still outside of the Caribou Protection Area and to monitor caribou distribution relative to areas of mineral interest in the SE corner of the Protection Area and inland from Whale Cove.
July 12	1.8	Kaminuriak	Flight abandoned due to poor weather.
July 15	4.2	Kaminuriak	To delineate the distribution of cows and calves and to check for caribou in the vicinity of the Borealis Exploration Area of mineral interest in the SE corner of the Protection Area.
TOTAL	90.8		

*This flight was not part of the monitoring program, but information obtained during this flight is included in this report.

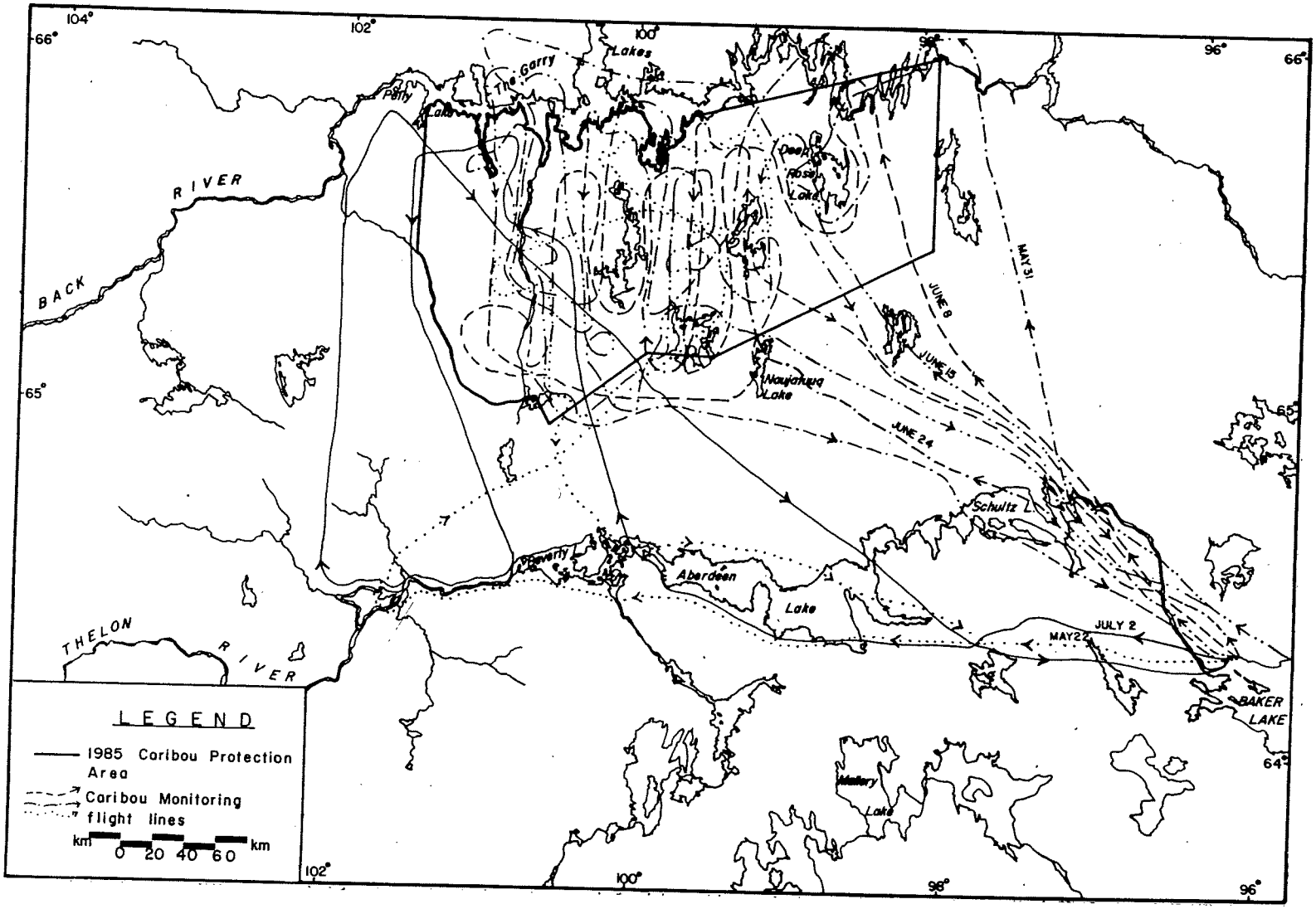

Figure 2. 1985 caribou monitoring flight lines within the summer range of the Beverly cow caribou population.

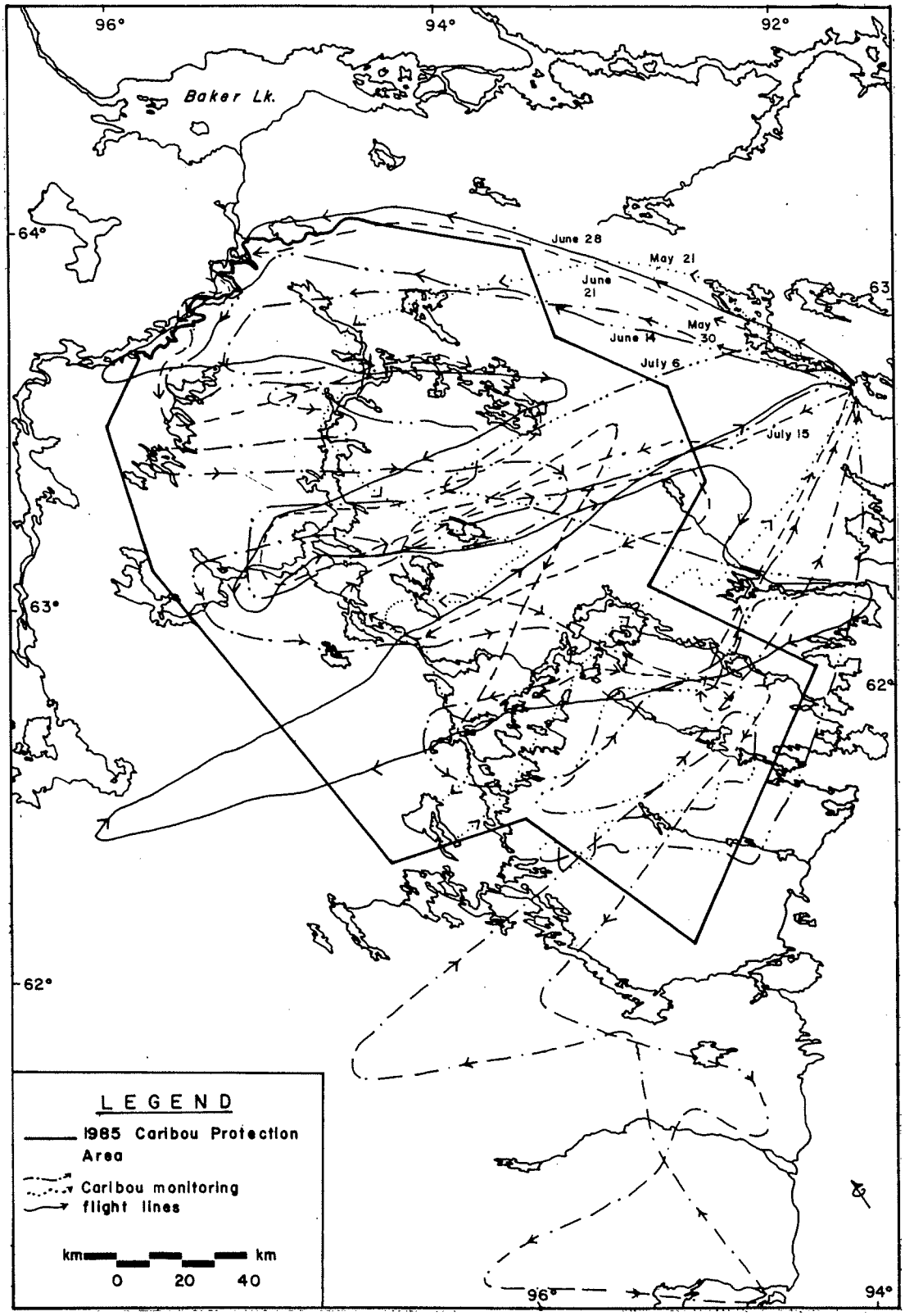

Figure 3. 1985 caribou monitoring flight lines within the summer range of the Kaminuriak cow caribou population.

Caribou sightings, estimated abundance and direction of caribou tracks were used to determine distribution, relative abundance and migration patterns of cow caribou (Appendix B). The Beverly calving ground was subjectively delineated by flying north-south transects, approximately 10 km apart. The Kaminuriak calving ground was delineated by GNWT biologists as part of the 1985 Kaminuriak Caribou Population census following methods described by Heard (1981). Caribou groups were classified whenever possible according to the most representative sex and age of the animals present:

1. Cows with yearlings
2. Cows with calves
3. Bull groups (with juveniles)

Group size was estimated visually. Ice and snow conditions, ambient temperature and the presence of human activity and other wildlife species were noted during all flights. Observations were plotted on 1:500,000 topographical maps. Survey flight reports and summary maps (1:1,000,000) were filed with the INAC district office in Rankin Inlet within 48 hours of each monitoring flight.

RESULTS AND DISCUSSION

Beverly Population

Spring Migration and Calving Area

Migrating cows of the Beverly population were located in mid-March by Canadian Wildlife Service biologists in the vicinity of Nonacho Lake (61°40'N, 109°30'W) (D. Thomas pers. comm.). On 28 March, the majority of these caribou had moved northwest to Whitefish Lake (62°45'N, 106°40'W) where D. Thomas estimated that he observed 25,000 - 50,000 caribou (pers. comm.).

Kelsall (1968) reported the first week of May to be the usual time that cows arrive at the tree line. However, the timing of spring migration and arrival of cows onto the calving ground has varied between years. In 1985 cows were north of the tree line by late March. Darby (1978) and Cooper (1981) reported cows north of the tree line by early April in 1978 and 1980; cows arrived at the calving ground by mid-May in 1981, 1982 (Clement 1982, 1983) and 1984 (Bradley In prep.). In contrast, cows did not arrive on the calving grounds until late May in 1983 (Bradley and Gates 1984) and early June in 1979 (Darby 1980).

Poor weather delayed the first Beverly caribou monitoring flight until 22 May. At this time, the majority of cows and yearlings were densely concentrated along the northern boundary

of the Caribou Protection Area along the south shore of Garry Lake and Lower Garry Lake. The presence of trails indicated that large numbers of caribou had crossed the Thelon River between Beverly Lake and the Ursus Islands and travelled roughly north by northwest into the Protection Area (Fig. 4).

The 1985 spring migration route of Beverly cows is similar to those reported by the caribou monitoring program since 1978 and those documented between 1948 and 1967 (summarized in Darby 1978). In general, the routes lie "within a wedge from Artillery Lake to Ennadai Lake with the apex pointing towards Beverly Lake" (Darby 1978:42). Caribou typically cross the Thelon River west of Aberdeen Lake. In 1983, there was evidence that caribou had moved south from an area north of the Garry Lakes (Bradley and Gates 1984). This was not observed in 1985.

On 31 May, most of the cows in the Caribou Protection Area were distributed along an east-west axis from the west side of Deep Rose Lake to 65°25'N, 100°00'W (northwest of Sand Lake). Caribou observed along the south shore of Garry Lake and Lower Garry Lake on 21 May, had travelled east and northeast towards the north shore of Deep Rose Lake, then moved south and southwest.

By the next monitoring flight on 8 June, approximately 85% of the cows observed were accompanied by newborn calves. Cows were more densely concentrated than they had been on 31 May and the majority were observed just west of Sandhill Lake. Calving cows were observed at lower densities as far as 400 km west of the main

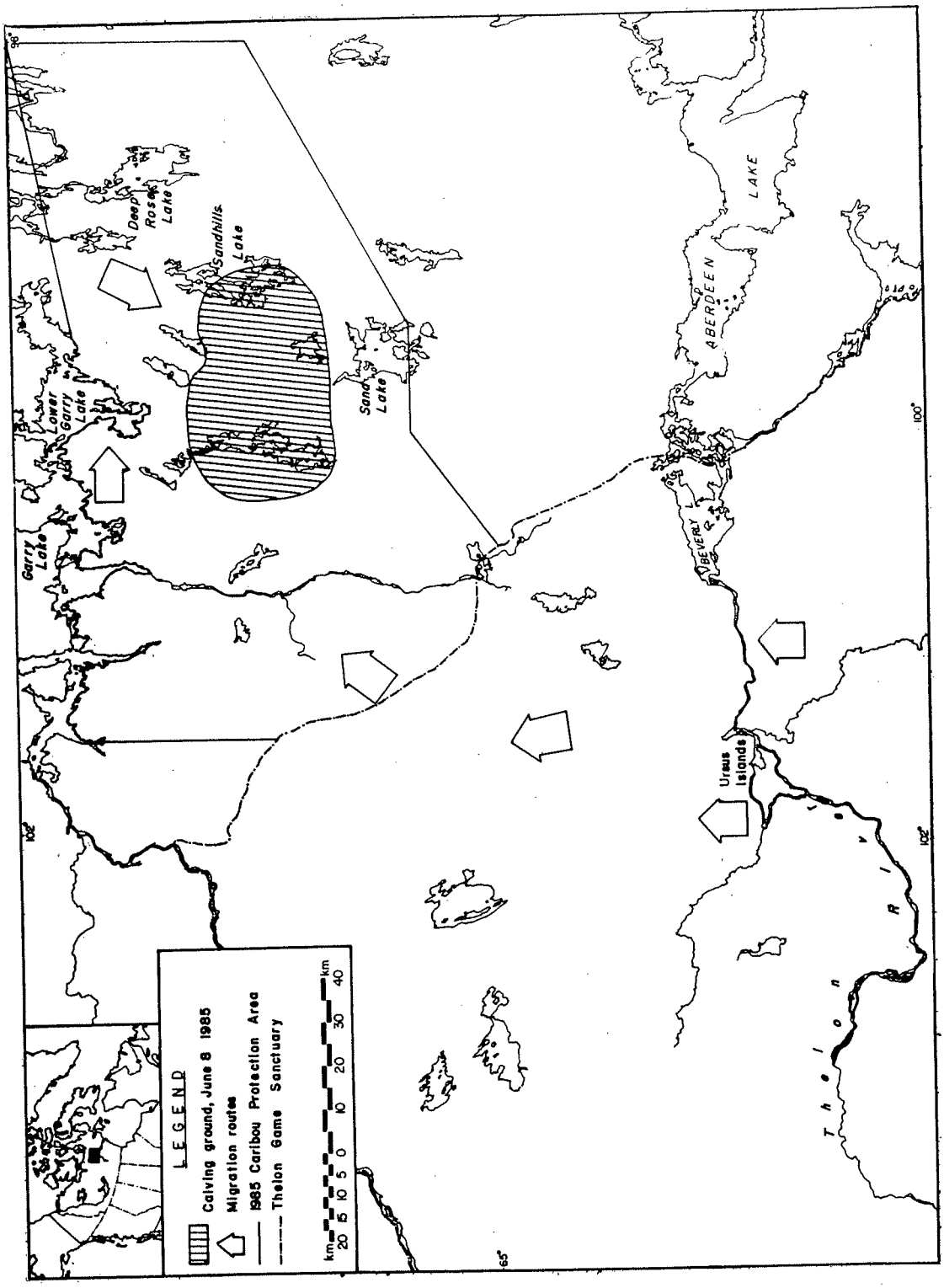

Figure 4. Major spring migration routes and calving ground of the Beverly cow caribou population, 1985.

calving area (Fig. 4). Several thousand yearlings were observed in large groups along the western edge of the calving area.

On 15 June, Beverly cows and newborn calves were distributed in large post-calving aggregations within the high density calving area on the west side of Sandhill Lake. A second, much smaller post-calving aggregation was observed near the western edge of the calving area. Groups of yearlings, with some barren cows and cows with calves, were scattered between these high density areas.

Between the years 1957 and 1960, the Beverly calving area was centered on the Thelon River in the eastern portion of the Thelon Game Sanctuary. In 1962, 1971 and 1974, calving occurred east and southeast of Sand Lake (summarized in Mychasiw 1984). Since the beginning of the Caribou Monitoring Program in 1978, the Beverly calving area has been located roughly between the Garry Lakes, Sand Lake, Deep Rose Lake and the eastern boundary of the Thelon Game Sanctuary (Darby 1978, 1980, Cooper 1981, Clement 1982, 1983, Bradley and Gates 1984, Bradley In prep.). The 1985 calving area was smaller than that reported in recent years, but almost identical to that documented in 1980 (Cooper 1981). Calving occurred between 29 May and 8 June. The timing of calving is roughly consistant with intervals reported in 1979 (Darby 1980), 1980 (Cooper 1981), 1981 (Clement 1982) and 1984 (Bradley In prep.). The peak of calving occurred on 10 June in 1982 (Clement 1983) and between 4 and 11 June in 1978 (Darby 1978).

Post-Calving Movements

On 24 June, approximately 40,000 - 60,000 cows with calves were observed between the southwest shore of Upper Garry Lake and the southeast shore of Pelly Lake (Fig. 5). Cows were distributed at lower densities across to Sand Lake in the east.

By 2 July, cows and calves had moved out of the Caribou Protection Area. Approximately 20,000 cows and calves were observed southwest of Pelly Lake along the northwest boundary of the Thelon Game Sanctuary. Since there was no evidence that caribou had crossed the Thelon River, the majority of cows with calves were probably further west or southwest of Pelly Lake in the Thelon Game Sanctuary. No further monitoring was conducted in the Beverly Caribou Protection Area.

In some years between 1948 and 1960, post-calving cows moved east and northeast of their calving area and occupied an area roughly north of Baker Lake to Deep Rose Lake and southwest to Aberdeen Lake (reviewed in Darby 1978). Since 1960, post-calving movements have consistantly been to the west and southwest of 98°30' longitude. The majority of cows were reported within the Thelon Game Sanctuary by 27 June in 1978 (Darby 1978), 25 June in 1979 (Darby 1980), 7 July in 1980 (Cooper 1981), 13 July in 1981 (Clement 1982), 12 July in 1982 (Clement 1983), 4 July in 1983 (Bradley and Gates 1984) and 4 July in 1984 (Bradley In prep.). The direction and timing of post-calving movements in 1985 was similar to that of recent years.

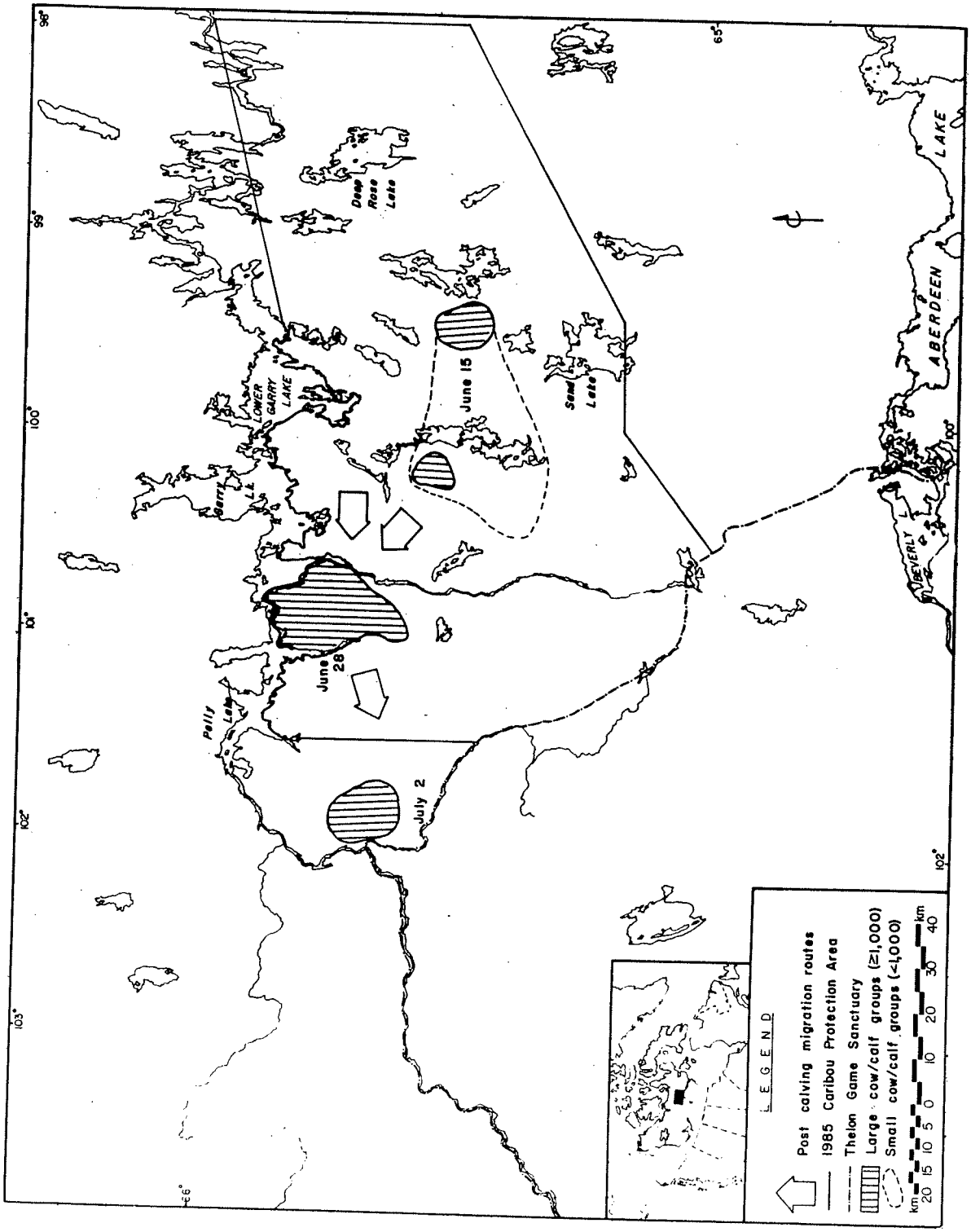

Figure 5. Post-calving distribution of cow caribou of the Beverly caribou population.

Kaminuriak Population

Spring Migration and Calving Area

The majority of the Kaminuriak population wintered south of the tree line in northern Manitoba and Saskatchewan, although some Kaminuriak caribou wintered in the vicinity of Eskimo Point (B. Kovik pers. comm.). In early April, GNWT biologists reported that several thousand cow/yearling caribou were situated between Maguse Lake and the Wallace River. These caribou came from the southwest as indicated by snow trails running from this direction (M. Bradley pers. comm.). Cow caribou were still abundant in this area by mid-April when GNWT biologists fitted 39 cows with radio collars (G. Stenhouse pers. comm.). In mid-late April, hunters reported large groups of cows in the vicinity of Cullaton Lake (61°20'N, 98°30'W)(D. Heard pers. comm.).

By 13 May, four radio-collared cows were relocated just south of Banks Lake in the Caribou Protection Area and three were relocated approximately 25 km southeast of Derby Lake. Between 13 and 16 May, Wildlife Officer D. Oolooyuk observed large groups of cows between Blakely Lake and Kaminuriak Lake, within the Caribou Protection Area (pers. comm.).

The first caribou monitoring flight was delayed by poor weather until 21 May. This flight was short due to poor weather, and coverage of the Caribou Protection Area was limited to major water bodies. Few caribou were observed during this flight and it appeared that the majority of cows were north of Kaminak Lake.

Caribou tracks indicated that large numbers of caribou had entered the Caribou Protection Area from the southeast and southwest. Very few trails or caribou were observed along the west shore of Kaminuriak Lake, suggesting that most caribou were still east of Kaminuriak Lake (Fig. 6).

The 1985 spring migration routes of the Kaminuriak cows were generally consistent with the movement patterns documented from 1948 to 1978 (summarized in Darby 1978), and those reported in subsequent years (Darby 1980, Cooper 1981, Clement 1982, 1983, Bradley and Gates 1984, Bradley In prep.). Darby (1978:48) describes the routes varying from year to year, "... but generally they lie within a wedge between Ennadai Lake and the Hudson Bay coast with the apex pointing north towards Kaminuriak Lake". In some years, portions of the Kaminuriak population have wintered between Rankin Inlet and Chesterfield Inlet and migration from the north has been observed (in Darby 1978, Clement 1982, 1983). There was no evidence that this occurred in 1985. On 30 May, the majority of cows were concentrated between the southwest shore of Banks Lake and Duffy Lake. A small concentration of cow caribou was found west of Kaminuriak Lake. Smaller groups of cows were scattered between Banks Lake and Kaminuriak Lake. The presence of tracks and observations of caribou indicated that many animals had moved south from Blakely Lake while others had crossed Kaminuriak Lake from the west.

Information on the timing of calving and the distribution of calving cows was obtained by GNWT biologists (including the caribou

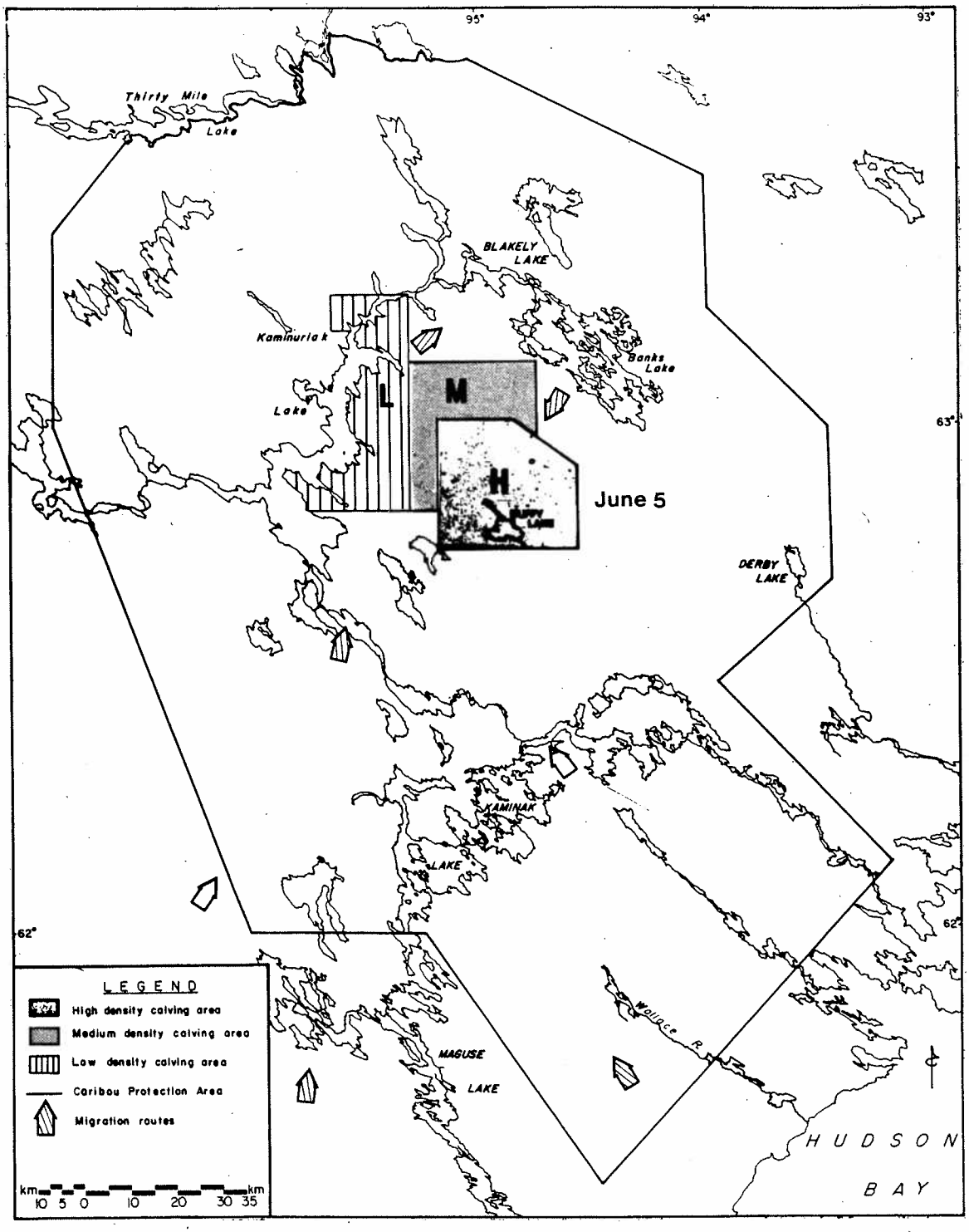

Figure 6. Major spring migration routes and calving ground (Heard pers. comm.) of the Kaminuriak cow caribou population, 1985.

monitor) in conjunction with a calving ground census of the Kaminuriak population conducted between 5 and 7 June. On 5 June, the calving ground was stratified into areas of high, medium and low cow density following an intensive survey of the area (Fig. 6). Since 30 May, the majority of calving cows had moved south into an area of high cow density centered on Duffy Lake. The 1985 calving ground was located in the centre of the Caribou Protection Area. The peak of calving occurred on 6 June.

Mychasiw (1984) reviewed the Kaminuriak calving distribution observed from 1963 to 1982. Over the past 2 decades, calving grounds have become smaller and have shifted southwest into the Kaminuriak Lake area. In 1979, 1980, 1982, 1983 and 1984, calving grounds extended well to the west side of Kaminuriak Lake. The 1985 calving distribution was similar to the distribution of recent years, except that very few cows calved west of Kaminuriak Lake. The peak of calving has been reported to occur between 3 and 7 June in 1978 (Darby 1978), between 5 and 10 June in 1979 (Darby 1980), on 3 June in 1982 (Clement 1983), 9 June in 1983 (Bradley and Gates 1984) and between 2 and 6 June in 1984 (Bradley In prep.).

Between 11 June and 14 June, cow caribou with calves were forming high density post-calving aggregations which were centred within the area previously identified as the core of the calving grounds (D. Heard pers. comm.). Cows which had calved south and west of the core of the calving ground had moved into the high density area by 14 June.

Post-Calving Movements

On 21 June, Kaminuriak cows and calves were grouped into large nursery bands (greater than 1,000 caribou) approximately centred on 62°47'N, 93°30'W (Fig. 7). Cows appeared to be less densely distributed than they had been on 14 June.

In late June, cow/calf groups moved southeast and by 28 June, approximately 40,000 - 60,000 cows and calves were observed outside the Caribou Protection Area along the east and west shores of the Wilson River around Maze Lake. Less than 3,000 cows and calves were located in the southern portion of the Caribou Protection Area south of Quartzite Lake and west to Kaminak Lake.

By 6 July, cows and calves were no longer in the vicinity of Maze Lake. Well-used trails indicated that caribou had travelled southwest into the Caribou Protection Area as far as Maguse Lake, while other tracks were heading south towards the Maguse River. Approximately 20,000 cows and calves were located east of the north end of Maguse Lake, and approximately 10,000 cows and calves were observed along the Copperneedle River. Caribou were walking south and southeast towards the Maguse River.

Between 6 and 8 July, residents of Eskimo Point reported large concentrations of cows and calves along the Maguse River. Wildlife Officer Ben Kovik (pers. comm.) reported that large groups of cows and calves moved past a hunting camp located on the western shore of Dionne Lake from 6 to 10 July. On 15 July, the area east of Kaminak Lake and Maguse Lake was monitored as far south as Hyde Lake. No caribou were observed during this flight, although nine

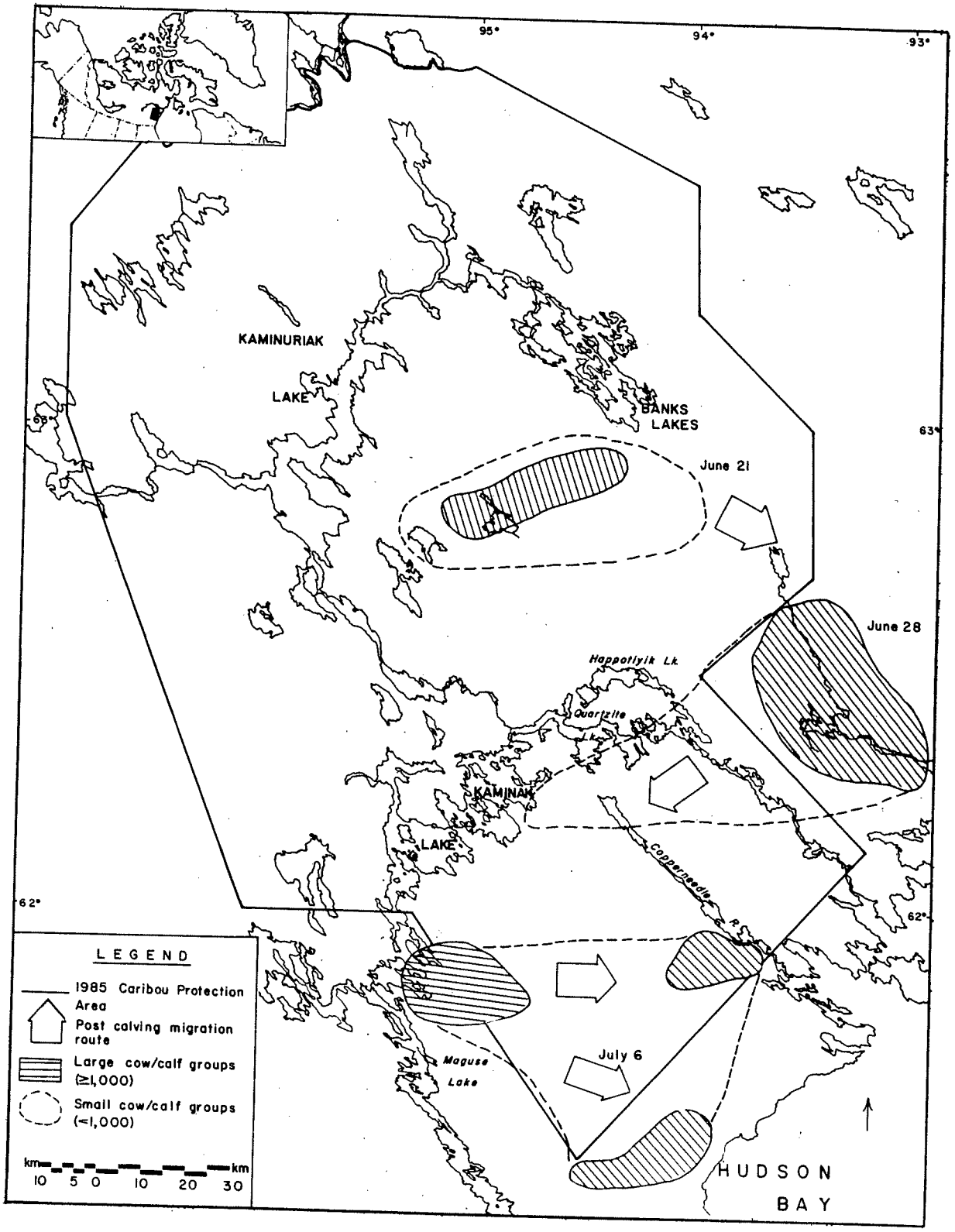

Figure 7. Post-calving distribution of cow caribou of the Kaminuriak caribou population.

of 38 radio-collared cows were located in the approximate vicinity of Kaminak Lake and Maguse Lake (four within and five to the southwest of the Caribou Protection Area). While some cows and calves were still within the Caribou Protection Area, the majority were probably distributed to the west of the monitoring flight line (west of Kaminak Lake in the north and 96°30'N in the south).

On 27 July, GNWT biologists used radio telemetry to track radio-collared caribou while flying along a straight line from Rankin Inlet to 60°30'N, 102°20'W (Kasba Lake); returning along a straight line to South Henik Lake; north from this lake to 62°20'N and straight to Rankin Inlet. No radio-collared caribou were detected.

Since the caribou monitoring program began in 1978 (except 1982 for which no comparable data exist), post-calving cows have generally moved southeast towards the Maguse River in early July. By mid-July, movements are typically west and southwest from the coast, although movements to the south and the north have also been reported in some years.

Land Use Activities

Between 15 May and 15 July, there were three land use permit sites in the vicinity of the Beverly Caribou Protecion Area and two in the vicinity of the Kaminuriak Caribou Protection Area (Fig. 1). Sites under land use permits, some claim areas and other areas of mineral interest (Laporte 1985) were monitored during the study period.

No caribou were observed near Urangasellschaft's Lone Gull camp (#N83C846) on 22 May, or near Urangasellschaft's PL-23 or Long Lake camps (both camps under permit #N83C866) on 24 June. Fewer than 100 bull caribou were observed on 2 July near any of these three camps or near land use site #N83C896.

On 30 May and 21 June, the caribou monitor flew over an area of mineral interest (Borealis Exploration Ltd.) in the southeastern portion of the Kaminuriak Caribou Protection Area (62°13'N, 93°51'W) and within 10 km of an area of mineral interest under consideration by Canadian Nickel (62°20'N, 93°00'W). No caribou were observed near either site. On 28 June, the eastern edge of 40,000 - 60,000 cows and calves were within 10 km of the Canadian Nickel interest area and approximately 800 cows and calves were observed at the Borealis Exploration site. No caribou were observed within 80 km of land use site #N84J172 on 28 June. No caribou were observed near the Borealis Exploration and Canadian Nickel interest areas during the monitoring flights of 6 July and 15 July.

Water Crossings

Designated water crossings (Darby 1980) within the summer range of the Kaminuriak and Beverly caribou populations (Fig. 8) were ice-covered until early- to mid-June. Between 20 June and 15 July, designated water crossings were monitored for use and new crossing sites were documented.

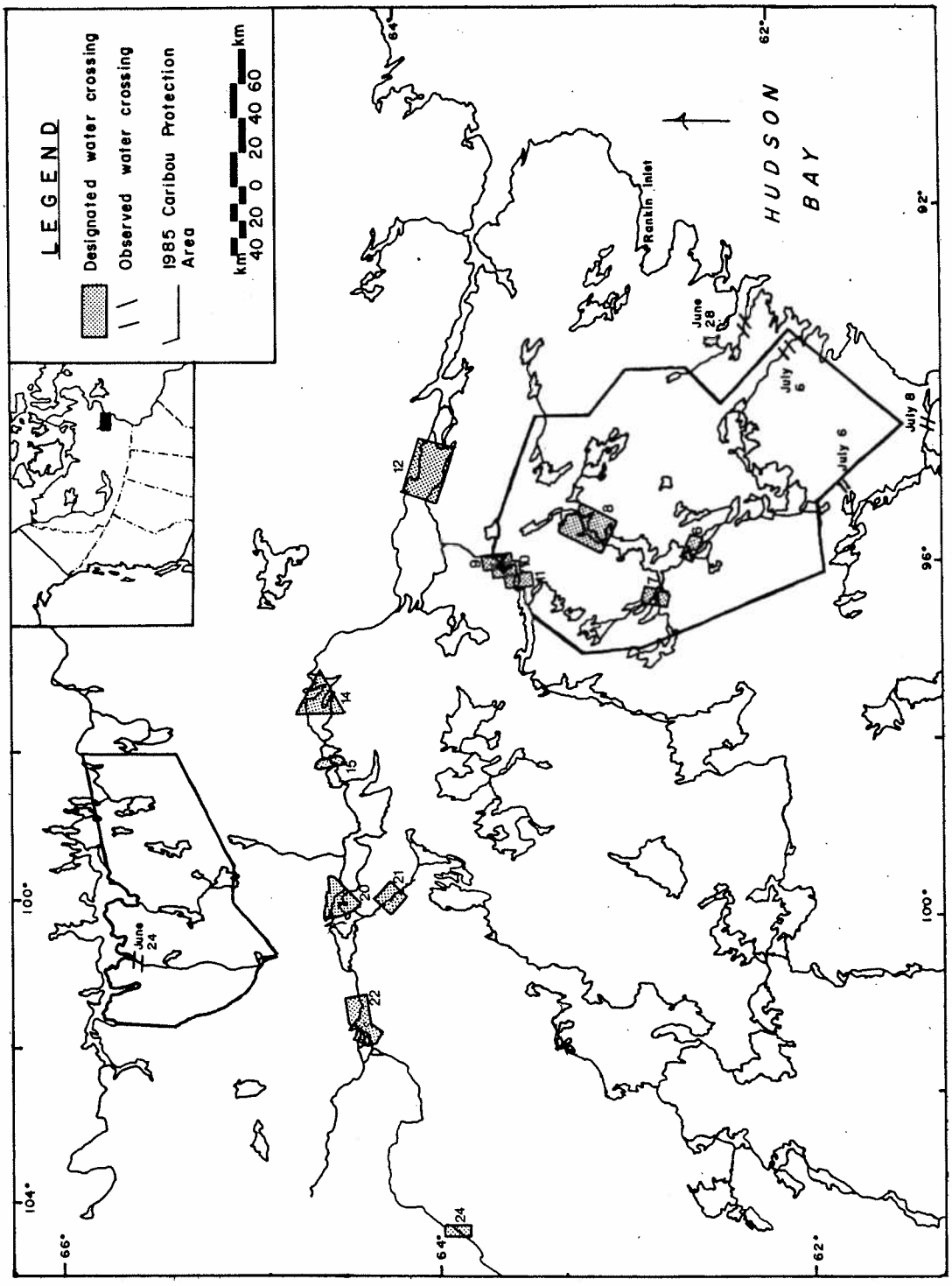

Figure 8. Designated water crossings and observed water crossings within the summer range of the Beverly and Kaminuriak cow caribou populations.

On 24 June, approximately 5,000 Beverly cows and calves were observed crossing the Upper Garry River (65°43'N, 100°42'W). It is likely that most of the 40,000 - 60,000 cows and calves to the west of the river had also used this crossing. During this flight, crossing site #14 was surveyed although it had not been used. On 2 July caribou had not used crossing sites #15 and #20, although there was evidence of moderate use by bull caribou of crossing sites #22 and #23.

Within the summer range of Kaminuriak cows designated water crossing sites #6-11 were monitored on 21 June and 28 June. Bulls had used sites #9-11, but no other water crossings had been used. On 28 June, two major water crossing sites were documented along the Wilson River south of Maze Lake (62°21'N, 93°13'W and 62°22'N, 93°15'W). There were more than 10,000 cows on either side of the river, suggesting that several thousand caribou had crossed at these points. On 6 July, 2,000 cows and calves were seen crossing the Copperneedle River (61°57'N, 95°50'W) in the southeast corner of the Caribou Protection Area, and approximately 20,000 cows and calves were crossing a small unnamed river 10 km northeast of Tootyak Lake (61°55'N, 95°03'W). Between 6 and 8 July, Wildlife Officer Ben Kovik reported several thousand cows and calves crossing the Maguse River at 61°24'N, 94°20'N.

MONITORING RECOMMENDATIONS

1. In recent years of the Caribou Monitoring Program, caribou have been observed crossing rivers at several undocumented sites. It is recommended that these sites be evaluated for possible designation as water crossing sites.
2. During caribou monitoring flights, radio-collared cow caribou were tracked from an altitude of 1,500 - 2,000 m above ground level, following the low level monitoring flight. Locations of radio-collared cows aided the caribou monitor in finding large groups of caribou. Since the additional information on caribou distribution, based on radio collar relocations, would greatly enhance the Caribou Monitoring Program, it is recommended that the GNWT consider integrating a radio tracking program with the Caribou Monitoring Program.
3. Specific criteria should be established to assist the caribou monitor in delineating caribou calving grounds. Given the mandate of the Caribou Monitoring Program, the caribou monitor should be expected to determine only the outer boundaries of the calving grounds at a gross scale, and to define areas of high and low density. The following criteria are recommended:

i) Transect lines should be flown at regular intervals as soon as calving cows are encountered during a monitoring flight.
   a) A 5 km transect interval is recommended within the high density calving area.
   b) A 10 km transect interval is recommended within areas of low density.

ii) Since calving cows typically exhibit highly clumped distribution in very large calving aggregations (greater than 5,000 cows), a high density area may be defined as including all aggregations of greater than 1,000 cows, while low density areas include aggregations of less than 1,000 cows. Any attempts to stratify the calving grounds based on more than two catagories would require an increase in aerial coverage to ensure an adequate degree of sampling precision. Additional flying time would not be feasible under the current Caribou Monitoring Program.

ACKNOWLEDGEMENTS

I would like to thank pilots Peter Cox and Rob Weldon for their capable flying and cheerful assistance. Mark Bradley provided useful advice based on his experiences as the Caribou Monitor in 1983 and 1984. Wildlife Officers Randy Forsyth, Ben Kovik, David Oolooyuk and Roger Toews kept me informed on caribou reports from local residents. This report was reviewed by Paul Gray, Kaye MacInnes, Len Mychasiw and Gord Stenhouse.

PERSONAL COMMUNICATIONS

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APPENDIX A. 1985 Caribou Protection Measures

CARIBOU PROTECTION MEASURES (KAMINURIAK AND BEVERLY HERDS)

CARIBOU PROTECTION AREAS

1. (a) The Permittee shall not, without approval, conduct any activity between May 15 and July 15 within the Caribou Protection Areas depicted on the map certified by the Engineer as the "Caribou Protection Map" annexed to this Land Use Permit.

   (b) A Permittee may, upon approval by the Land Use Inspector, operate within the said Caribou Protection Areas beyond the May 15 deadline set out in 1(a), provided that when monitoring information indicates that caribou cows are approaching the area of operation, the Permittee will implement 1(c).

   (c) On cessation of activities pursuant to 1(a) or 1(b), the Permittee will remove all personnel from the zone who are not required for the maintenance and protection of the camp facilities and equipment unless otherwise directed by the Land Use Inspector.

   (d) The Permittee may commence or resume activities prior to July 15 within those parts of the Caribou Protection Areas released by the Land Use Inspector for the reason that caribou cows are not expected to use those parts for calving or post-calving (note 1).

2. (a) In the event that caribou cows calve outside of the Caribou Protection Areas, the Permittee shall suspend operations within the area(s) occupied by cows and/or cows and calves between May 15 and July 15.

(b) In the event that caribou cows and calves are present the Permittee shall suspend:

(i) blasting,
(ii) overflights by aircraft at an altitude of less than 300 metres above ground level, and
(iii) the use of snowmobiles and ATV's (all-terrain vehicles) outside the immediate vicinity of the camp.

CARIBOU PROTECTION MIGRATION

3. (a) During migration of Caribou, the Permittee shall not locate any operations so as to block or cause substantial diversion to migration.

(b) The Permittee shall cease activities that may interfere with migration, such as airborne geophysics surveys or movement of equipment, until the migrating caribou have passed.

CARIBOU CROSSING

4. (a) The Permittee shall not, between May 15 and September 1, construct any camp, cache any fuel or conduct any blasting within 10 km of any "Designated Crossing" as outlined on the map certified by the Engineer as the "Caribou Protection Map" and annexed to this Land Use Permit".

(b) The Permittee shall not, between May 15 and September 1, conduct any diamond drilling operation within 5 km of any "Designated Crossing" as outlined on the map certified by the Engineer as the "Caribou Protecton Map" and annexed to this Land Use Permit.

NOTE

1. The Land Use Inspector's decision will be based on the existing caribou information.

2. Concentrations of caribou should be avoided by low level aircraft at all times.

APPENDIX B. 1985 Caribou Monitoring Flight Report

CARIBOU MONITORING FLIGHT REPORT

Date:

Caribou Herd:

Flight No.:

Aircraft:

Pilot:

Observers:

Cloud Cover:

Visibility:

Wind:

Temperature:

Land Use Rationale

Snow Cover

Ice Conditions

Observations: Numbers refer to points on flight map. Light tracks = less than 50 caribou travelled through area; moderate tracks = 50-100 caribou; heavy = more than 100 caribou; extensive = many heavily used trails in area.

Land Use Activities

Other Human Activities

Water Crossings

Summary

Flying Time: