BEVERLY AND KAMINURIAK CARIBOU

MONITORING AND LAND USE CONTROLS

1987

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GOVERNMENT OF THE NORTHWEST TERRITORIES

RANKIN INLET, NWT

1987

File Report No. 72

ABSTRACT

The timing and pattern of Beverly and Kaminuriak caribou movements, in relation to the Caribou Protection Areas, were monitored from 15 May to 15 July 1987. Information and data collected were used to make recommendations to Indian and Northern Affairs Canada in order to facilitate the enforcement of the Caribou Protection Measures.

By 3 June, Beverly caribou migrated into the Beverly Caribou Protection Area via the Thelon Game Sanctuary. The highest density of calving cow caribou extended from Sand Lake west to the Thelon Game Sanctuary. Lower densities were located east, north, and west of this high density zone. Peak calving occurred between 9 and 10 June. Nearly all caribou had left the protection are by 6 July, migrating southwest into the Thelon Game Sanctuary.

Kaminuriak caribou migrated north past Eskimo Point in March and northeast past Maguse Lake in May. By 15 May at least half of the cow caribou had entered the protection area. The highest density of calving cow caribou was centered around Happotiyik Lake with lower densities extending from Banks Lake to Southern Lake (north-south) and Derby Lake to Townsend Lake (east-west). Peak calving occurred between 8 and 11 June. From calving until early July, cow-calf caribou converged upon the general area of Happotiyik Lake. In early July, cow-calf caribou had split into northern and southern migrating groups. By 15 July, most cow-calf caribou were still in the protection area.

There were no active land use sites within the Beverly Protection Area between 15 May and 15 July.

Requests for early release were received from companies operating at three land use sites within the Kaminuriak Protection Area. Borealis Exploration Ltd. (land use permit N85C476) and Sunmist Energy (land use permit N87N690) received releases on 15 May. Noble Peak Resources (land use permit N87C666) received a release on 11 July.

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INTRODUCTION

In 1978, Indian and Northern Affairs Canada (INAC) implemented the Caribou Protection Measures (Appendix A) in order to minimize the effects of human disturbance on Kaminuriak and Beverly cow and cow-calf caribou (Rangifer tarandus groenlandicus). The protection measures specify areas where land use holders must get federal government permission to work between 15 May and 15 July. Historically, this is the period of time when these areas are used by cow caribou just before, during, and immediately after calving; an interval when caribou are deemed to be highly susceptible to disturbance.

The caribou monitoring program was implemented in order to facilitate the enforcement of the Caribou Protection Measures. Land use permit holders may apply to INAC for a release to work in the protection areas between 15 May and 15 July. The caribou monitor collects information and data on the movements and distribution of caribou, especially cow and cow-calf caribou, reporting observations and making recommendations to the INAC District Manager in Rankin Inlet. A significant number of caribou has been defined as 1,000 or more caribou of any age or sex occupying an area of 500 square kilometers, where 1,000 may mean 500 cows and 500 calves (Darby and Williams 1979). Greater concern is

directed towards cow and cow-calf caribou as opposed to bull and yearling caribou. Release requests are deferred if a significant number of cow or cow-calf caribou could potentially be affected by operations at the land use site.

This year's program continues the work done in previous years by Darby (1979), Darby (1980), Cooper (1981), Clement (1982), Clement (1983), Bradley and Gates (1984), Bradley (1985), Duquette (1985) and Liepins (1986). Mychasiw (1984) reviewed the first five years of the caribou monitoring program.

The protection area boundaries are subject to annual review. For 1987, approximately 375,000 hectares were added to the southern portion of the existing Kaminuriak Caribou Protection Area. The Beverly Caribou Protection Area remained unaltered.

This report contains information collected during flights between 15 May and 15 July 1987. Other sources of information were GNWT charter flights accompanied by the Caribou Monitor, GNWT Beverly caribou census project, GNWT post-calving photographic census of the Kaminuriak herd, and verbal reports of caribou sightings by various people in the field. In addition, this report contains an account of land use activities within and adjacent to the protection areas.

METHODS

In 1987, caribou monitoring flights were conducted from 15 May to 14 July over the caribou protection areas and adjacent land (Figure 1). In addition, extensive data were collected from a GNWT post-calving photographic census of the Kaminuriak caribou herd.

Most of the flying was conducted in a modified Beech-18 (Tradewinds). This aircraft cruised at a speed of 300 kilometers/hour and was equipped with an Omega navigation system which was particularly helpful during spring when landmarks were covered by snow and ice. A second modified Beech-18 (Merlin) was provided while the Tradewinds was unavailable due to maintenance inspections in July. The 11 June caribou monitoring flight was conducted in a Cessna 185.

A detailed flight plan was prepared before each departure. The particular flight route was formed on the basis of (in order of importance):

1) Land use activities within the protection areas;
2) Recent observations/reports of cow and cow-calf caribou movements;
3) historical patterns of movement;
4) designated water crossings; and
5) land use activities outside the protection area.

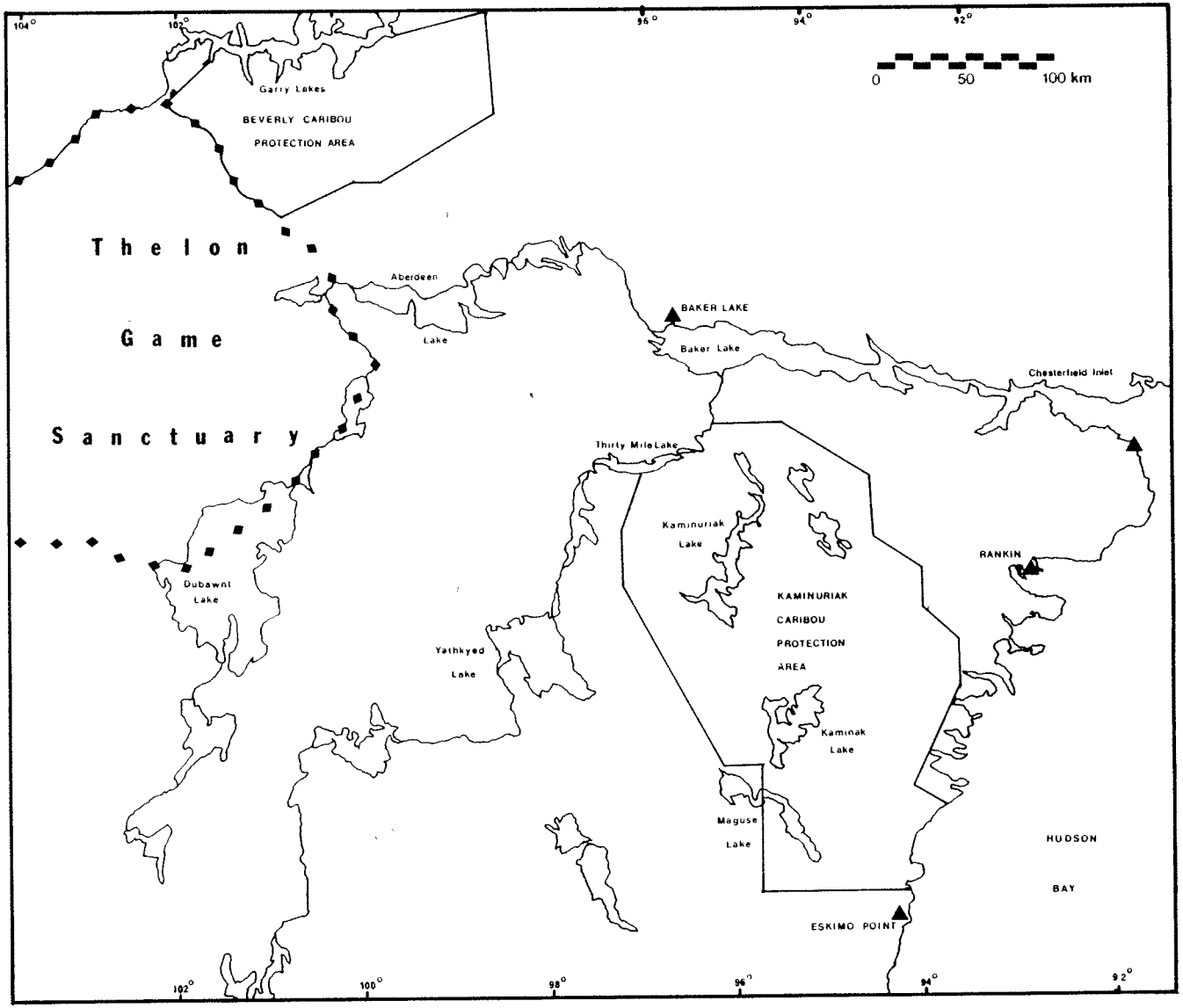

Figure 1. 1987 Caribou Protection Areas within the Keewatin Region.

Flights were conducted between 180 and 460 metres above ground level (AGL). During the first month of the monitoring program (15 May - 15 June) when snow still covered the ground, flights were commonly conducted at 180 meters AGL.

During the last half of the program, when caribou were assembling into large post-calving aggregations, flights were conducted at 460 metres AGL. Standard observations included:

1) Visual estimates of caribou numbers and when possible composition (i.e., cows, calves, yearlings, and/or bulls) and direction of movement;
2) Land use activities;
3) Caribou tracks, their heading and a rough estimate of the number of caribou which had passed through;
4) Changes in snow, ice, and weather conditions during the flight; and
5) Occurrence of wildlife species other than caribou.

A combination of Renewable Resources staff, INAC staff, HTA members, and pilots assisted the monitor with additional observations while conducting the aerial surveys. A verbal report was given to the Rankin Inlet INAC District Manager within 24 hours of each flight and standard written reports followed as soon as possible (Appendix B). Individual flight reports and summary maps were filed with Renewable Resources,

Eskimo Point and INAC, Rankin Inlet.

Data from the GNWT Beverly calving ground census are included in this report. The Caribou Monitor defined the location and boundaries of the Kaminuriak calving ground by flying a set of systematic flight lines over the entire protection area.

Flights totalled 43.0 hours - 14.7 hours during 4 flights over the Beverly herd (Figure 2) and 28.3 hours during 9 flights over the Kaminuriak herd (Figures 3 & 4).

Flight times were distributed as evenly as possible (weather aside) throughout the protection period, call-outs having priority (Table 1).

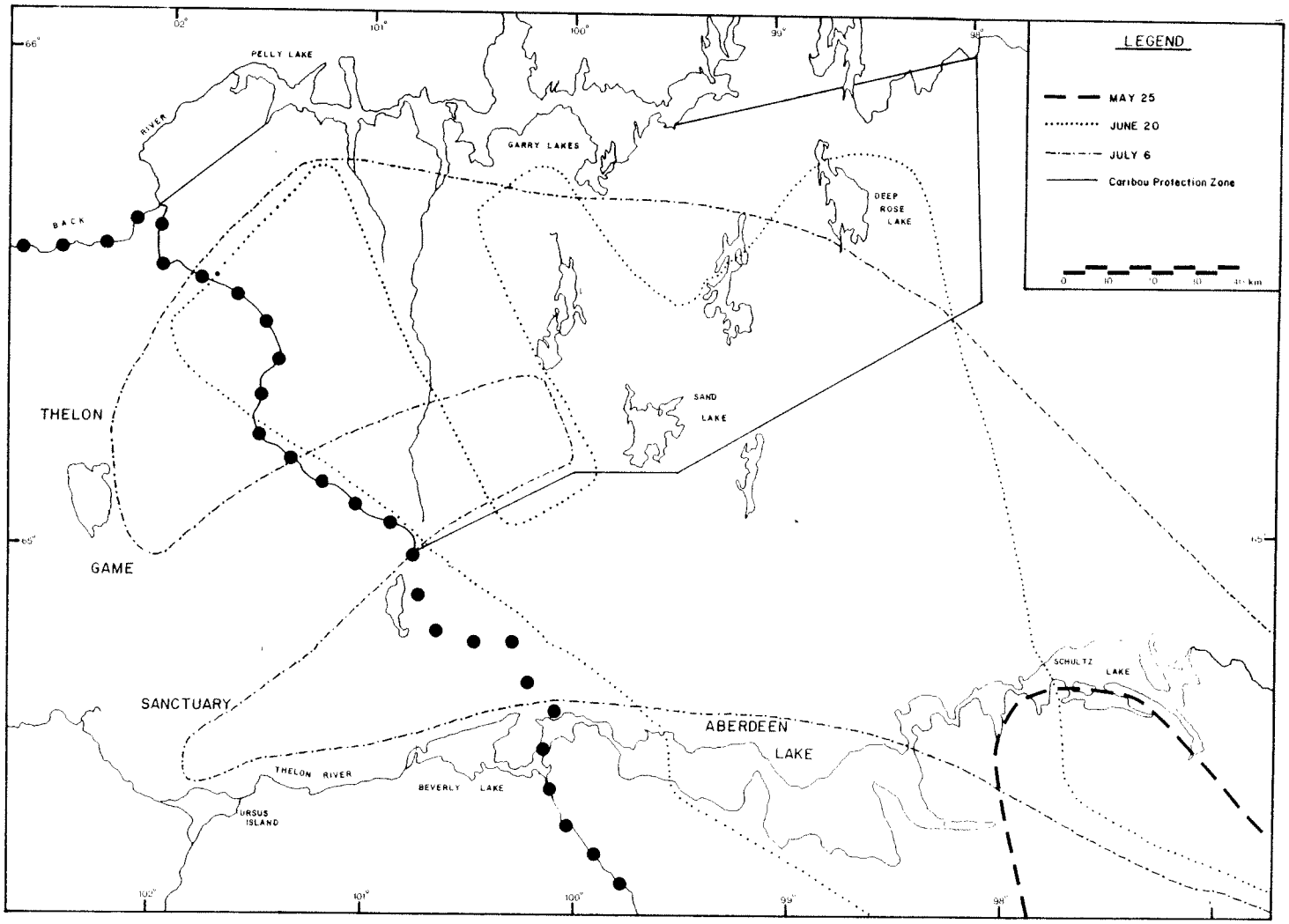

Figure 2. 1987 caribou monitoring flight lines over the Beverly Caribou Protection Area.

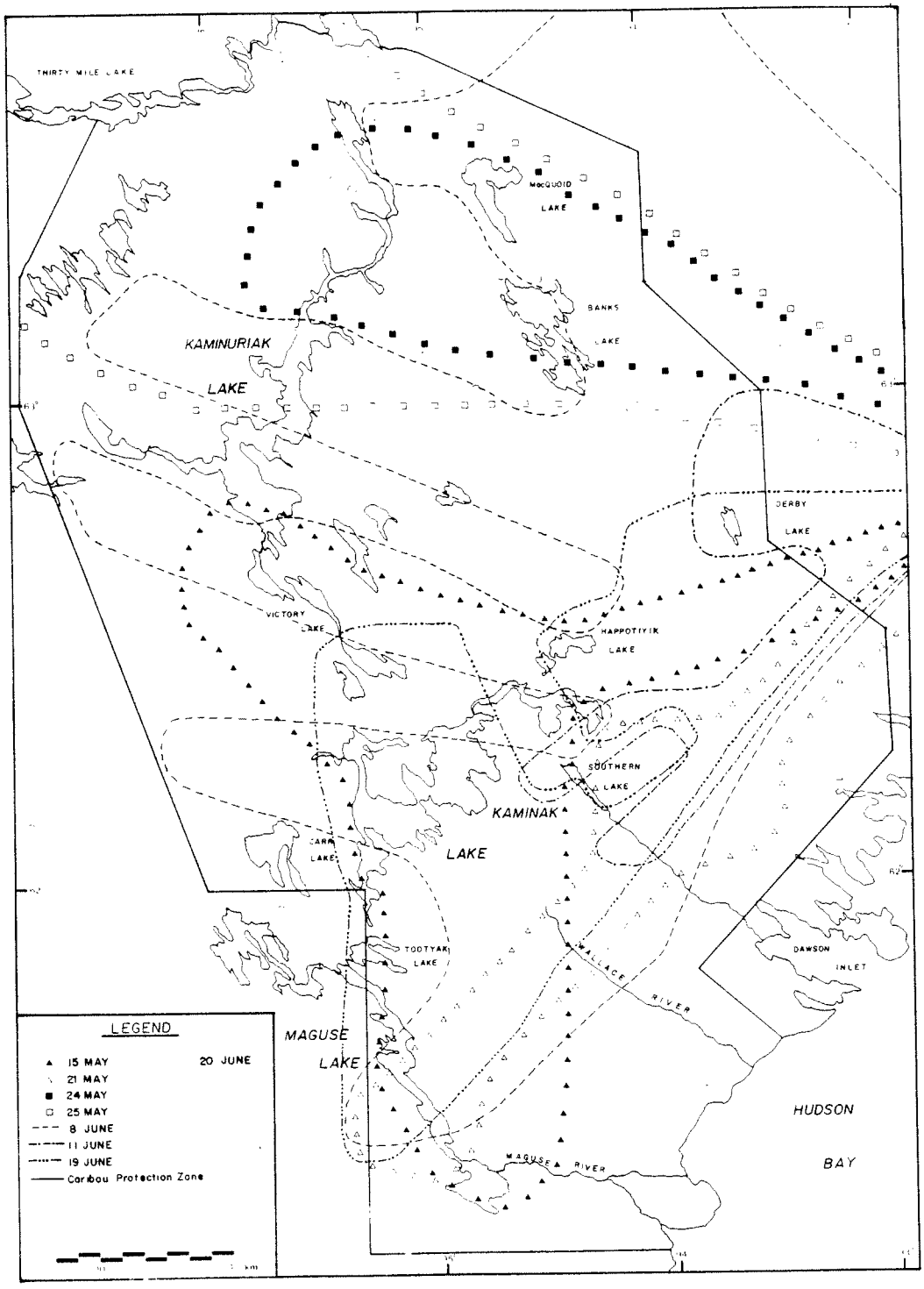

Figure 3. 1987 caribou monitoring flight lines over the Kaminuriak Caribou Protection Area (continued on Figure 4).

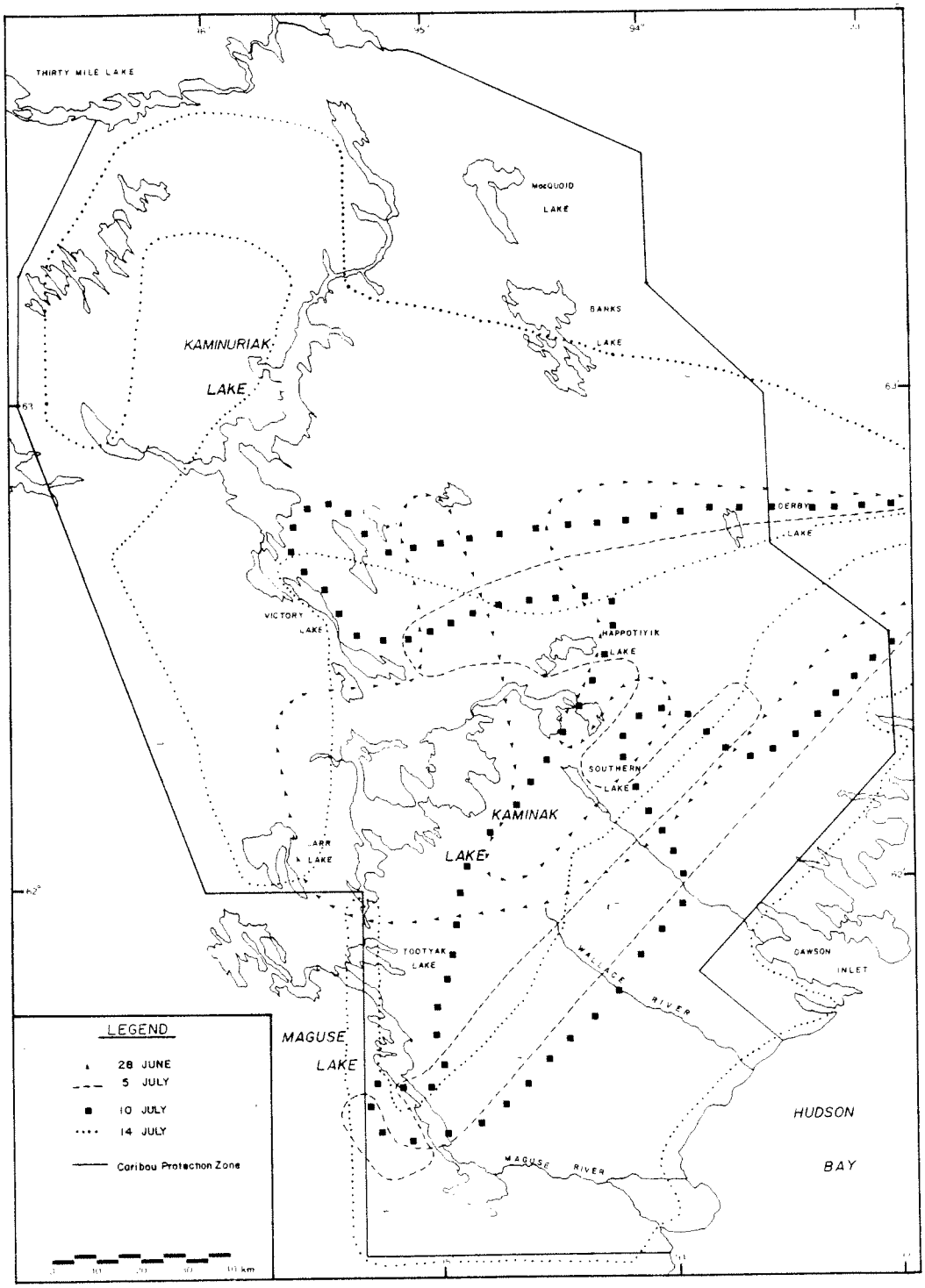

Figure 4. 1987 caribou monitoring flight lines over the Kaminuriak Caribou Protection Area (continued from Figure 3).

Table 1. Schedule of caribou monitoring aerial surveys for 1987.

Date	Hours	Caribou Herd	Objective
15 May	2.3	Kaminuriak	Primarily to investigate caribou activity in the vicinity of Borealis, Sunmist, and N.P.R. and secondarily to monitor the progress of Kaminuriak caribou towards their calving grounds.
21 May	1.9	Kaminuriak	To determine the proximity of cow caribou to Borealis and Sunmist.
24 May	1.7	Beverly and Kaminuriak	Primarily to monitor the progress of Beverly caribou towards their calving grounds and secondarily to monitor caribou activity in the northern portion of the Kaminuriak Caribou Protection Area.
25 May	3.3	Beverly and Kaminuriak	To monitor the progress of Beverly caribou towards their calving grounds. The 24 May attempt was aborted due to inclement weather.
8 June	5.0	Kaminuriak	To define the 1987 calving ground and to determine the proximity of cow caribou to Borealis, Sunmist and N.P.R.
11 June	2.5	Kaminuriak	To determine the proximity of cow and cow-calf caribou to Borealis.
19 June	2.7	Kaminuriak	Primarily to determine the proximity of cow and cow-calf caribou to Borealis, Sunmist, and N.P.R. and secondarily to monitor post-calving movements.

Table 1. (continued)

Date	Hours	Caribou Herd	Objective
20 June	2.7	Beverly and Kaminuriak	Primarily to monitor Beverly Caribou post-calving movements and secondarily to monitor caribou movements in the northern section of the Kaminuriak Protection Area.
28 June	5.0	Kaminuriak	Primarily to determine the proximity of cow-calf caribou to Borealis, Sunmist, and N.P.R. and secondarily to monitor post-calving caribou movements.
5 July	2.7	Kaminuriak	Primarily to determine the proximity of cow-calf caribou to Borealis, Sunmist, and N.P.R. and secondarily to monitor post-calving caribou movements.
6 July	4.7	Beverly	To monitor Beverly caribou post-calving movements.
10 July	2.5	Kaminuriak	Primarily to determine the proximity of cow-calf caribou to Borealis, Sunmist, and N.P.R. and secondarily to monitor post-calving caribou movements.
14 July	6.2	Kaminuriak	Primarily to determine the proximity of cow-calf caribou to Borealis, Sunmist, and N.P.R. and secondarily to determine the adequacy of the eastern and southern boundary of the Kaminuriak Protection Area.

RESULTS AND DISCUSSION

Beverly Caribou

Spring Migration

Beverly caribou overwintered (1986/1987) in two major concentrations (Thomas, unpubl. rep.). One concentration was distributed along the Snowdrift River, the second concentration along the Saskatchewan-NWT border between Brazen Lake (108°00' W longitude) and Selwyn Lake (104°30' W longitude). Portions of the more northerly concentration had reached the Hanbury River by 29 March.

Marginal weather conditions delayed caribou monitoring flights to the Beverly herd until 24 May. Attempts on 24 and 25 May had to be terminated due to inclement weather west of Baker Lake. Due to budget restrictions no further attempts were made before calving.

A GNWT reconnaissance flight on 3 June showed that Beverly cow and yearling caribou were migrating into the protection area via the Thelon Game Sanctuary (Figure 5). At this time, thousands of cow and yearling caribou were observed within the western portion of the protection area and within the adjacent Thelon Game Sanctuary. Caribou Monitors have recorded similar spring migration routes since 1978.

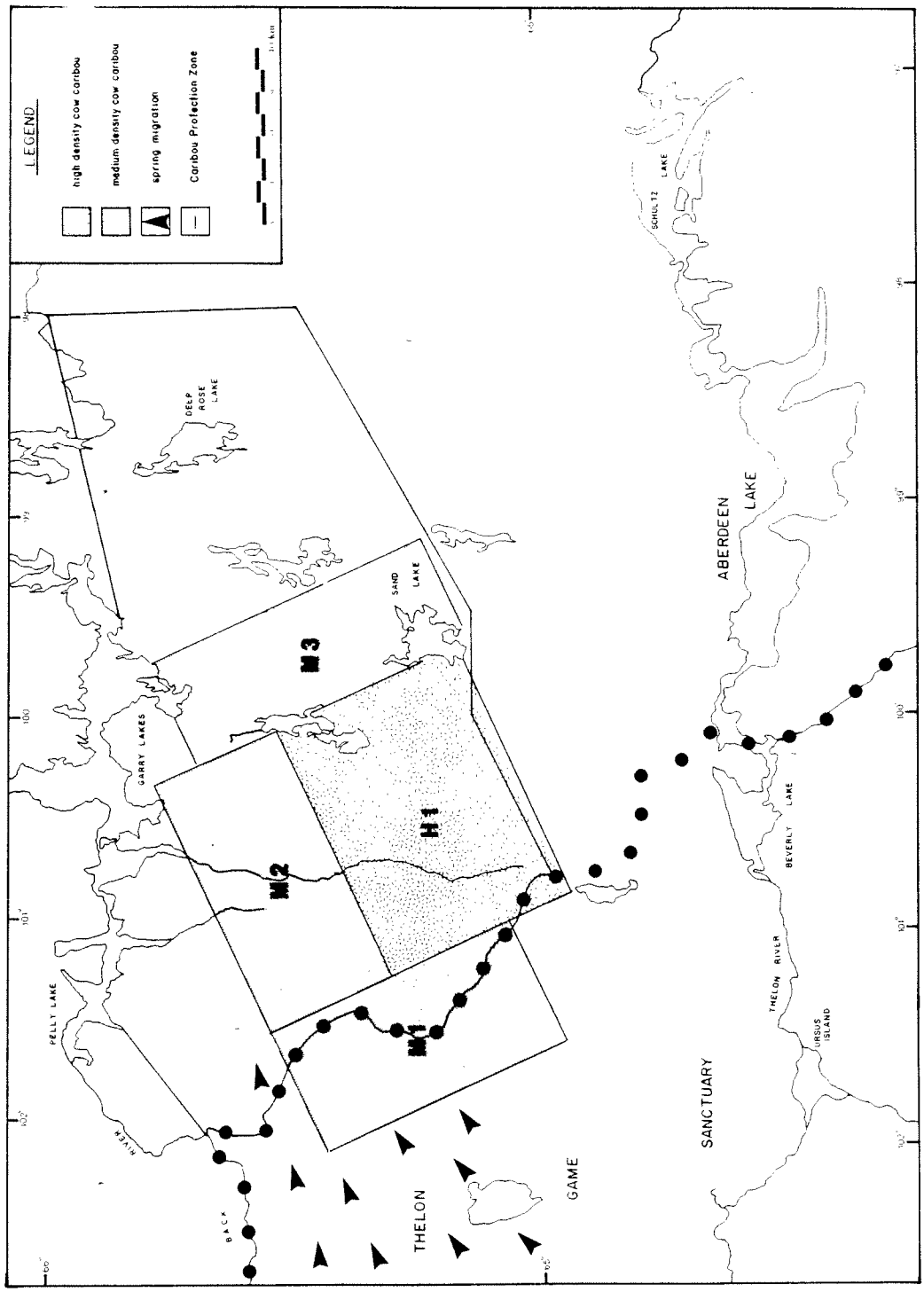

Figure 5. 1987 Beverly caribou spring migration and calving ground.

Calving Grounds

At calving, GNWT staff defined four cow caribou density zones; one high density zone (H1) and three medium density zones (M1, M2, and M3; Figure 5). The percentage of breeding cows for each zone was quantified; H1-70%, M1-37%, M2-70%, and M3-82%. Peak calving, the date when half the cows are accompanied by calves, occurred between 9 and 10 June.

The location of the 1987 calving ground is typical of calving grounds reported in previous years. All cow caribou calved within the protection area with the exception of:

1) a small portion of the H1-high density zone located outside the southern boundary of the protection area. A similar distribution was recorded in 1984 (Bradley 1985), and;

2) a substantial portion of the M1-medium density zone located within the Thelon Game Sanctuary. This zone had a low percentage of breeding cows (37%). The presence of calving cow caribou within the Thelon Game Sanctuary was also recorded in 1979, 1980, and 1982 (Darby 1980; Cooper 1981; Clement 1983 respectively).

Post-calving Movements

Observations made during a GNWT reconnaissance radio-collar tracking flight (accompanied by the Caribou Monitor)

on 15 June indicated that the Hl-high density cow caribou zone had shifted 20 to 30 kilometers northwest of their location at calving.

On 20 June, a relatively high density band of caribou stretched from 65° 27'N, 100° 15'W to 65° 00'N, 101° 30'W. Within this band, caribou had begun aggregating into groups of approximately 40 animals. Cows, calves, yearlings, and bulls were consistently seen together although small groups of yearlings and bulls were still distributed in peripheral regions northwest and southeast of this high density caribou band. Few caribou were observed in the eastern portion of the protection area (east of Lower Gary and Sand lakes).

By 6 July, virtually all caribou had left the protection area; no caribou were observed in the eastern half of the protection area. Small groups of caribou (500 animals or less) were located north of Ursus Island and Beverly Lake, inside the Thelon Game Sanctuary. The position of these animals, combined with the presence of extensive tracks in the southwest corner of the protection area and absence of caribou and caribou tracks elsewhere, strongly suggests that post-calving caribou migrated south through this area into the Thelon Game Sanctuary (Figure 6). Since caribou had left the protection area, no further flights were conducted to observe the Beverly herd. The Beverly herd has been

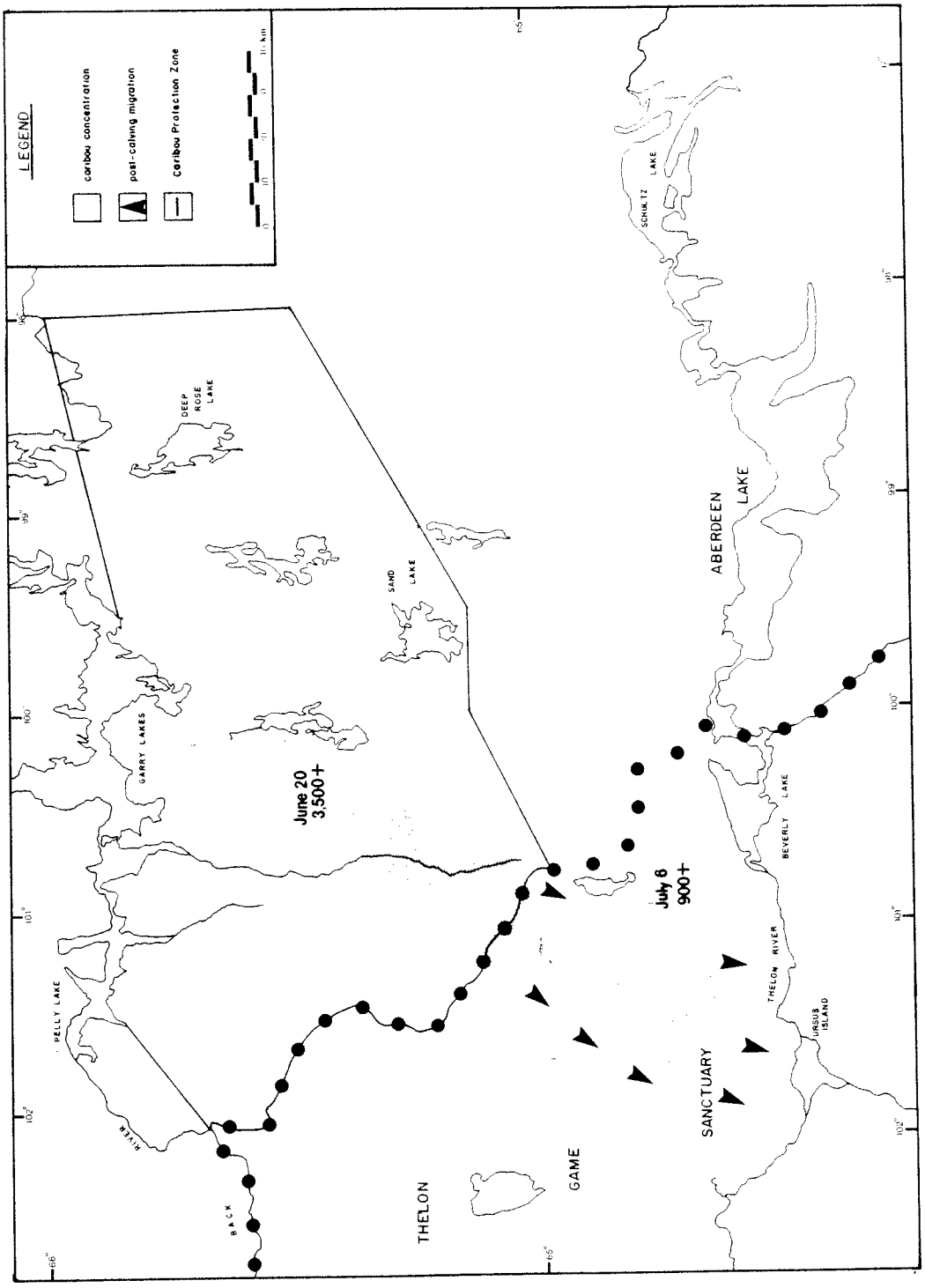

Figure 6. 1987 Beverly caribou post-calving migration.

relatively consistent in the timing and direction of post-calving migrations. Historically, the herd has left the protection area by the first week in July and has migrated west and/or southwest into the Thelon Game Sanctuary (Darby 1979 and 1980, Cooper 1981, Clement 1982 and 1983, Bradley and Gates 1984, Bradley 1985, Duquette 1985, Liepins 1986).

Kaminuriak Caribou

Spring Migration

In late March, Larry Gray (pers. comm.) reported seeing over 10,000 caribou migrating north past the community of Eskimo Point. These caribou were mainly composed of cows, calves, and yearlings; only a few bulls were present.

By early May, Eskimo Point hunters were reporting large numbers of caribou migrating north between North and South Henik Lakes (Ben Kovic, pers. comm.). At the same time, a second caribou concentration was spotted east of Ennadai Lake. On 10 May, hunters reported two large concentrations of caribou, one at the north end of Maguse Lake and a second heading north towards Happotiyik Lake (Ben Kovic, pers. comm.).

The first caribou monitoring flight was conducted on 15 May. A small number of caribou were located southeast of

Kaminak Lake and at the north end of Maguse Lake (this flight was hampered by poor weather and light conditions). Radio telemetry work indicated that over half the collared caribou (mostly cow caribou) were within the protection area by 15 May. In addition, the distribution of collared caribou suggested that caribou were still migrating in through the southwest corner of the protection area.

A 21 May monitoring flight located small groups (maximum group size was 45 animals) of cow and yearling caribou migrating northeast past the north end of Maguse Lake.

On 24 and 25 May, flights over the northern portion of the Kaminuriak Caribou Protection Area (while enroute to the Beverly herd) discovered over 2,000 cow and yearling caribou in the general vicinity of Banks Lake.

There appears to have been two major spring migration routes, a northerly movement past Maguse Lake in May (Figure 7). Similar migration routes have been documented since the inception of the monitoring program in 1978 (Darby 1979 and 1980, Cooper 1981, Clement 1982 and 1983, Bradley and Gates 1984, Bradley 1985, Duquette 1985, Liepins 1986). In some years, Kaminuriak caribou have wintered north of the protection area (Darby 1978, Clement 1982 and 1983, Liepins 1986). There was no evidence that this occurred during the

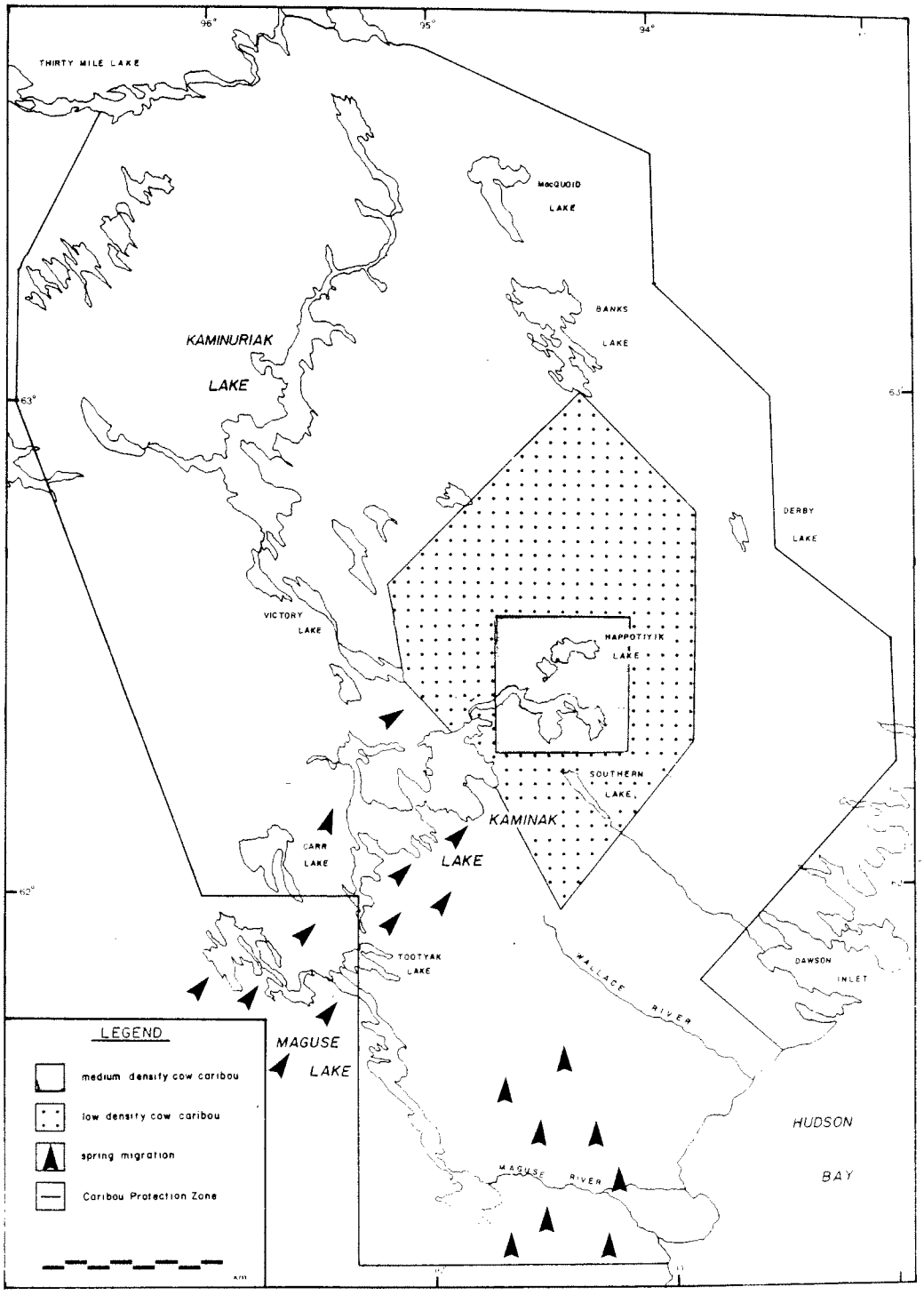

Figure 7. 1987 Kaminuriak caribou spring migration and calving ground.

1986/87 winter.

Calving Grounds

On 8 June, a set of systematic lines were flown over the entire protection area in order to define the boundaries of the 1987 Kaminuriak calving ground. Low and medium cow caribou density zones were identified (Figure 7). Peak calving occurred between 8 and 11 June.

A 11 June monitoring flight reconfirmed the cow-calf distributions and density zones in the southeastern portion of the calving grounds. Nearly all relocated collared caribou were within the area defined as the calving grounds. Only 4 collared caribou were unaccounted for by the end of calving; one cow was discovered with the Beverly herd (Doug Heard, pers. comm.).

Since 1978, the calving grounds have been the general area of Kaminuriak Lake (Darby 1979 and 1980, Cooper 1981, Clement 1982, Bradley and Gates 1984, Bradley 1985, Duquette 1985, Liepins 1986) with the exception of 1982 when cows calved between Ferguson Lake and Kaminuriak Lake (Clement 1983). Mychasiw (1984) reported that "calving grounds north of Banks Lake were used in each of the 11 years between 1963 and 1977 for which Kaminuriak calving distributions were documented". Although the 1987 calving grounds were inside

By 5 July, three groups of cow-calf caribou had left the core area. An estimated 5,000 cow-calf caribou were seen heading northwest past O'Neil, Victory, and Townsend lakes (John Russell, pers. comm., Guy Sainte Andre, pers. comm.). A second group of 5,000+ cow-calf caribou was spotted heading south past Tootyak Lake (John Russell, pers. comm.). The third group of 2,000+ cow-calf caribou was distributed along the northeast shore of Maguse lake. An additional 2,000+ bull-yearling caribou were distributed along the southwest shore of Maguse Lake presumably having just arrived from the south as indicated by the presence of extensive tracks south of this locality.

A 10 July monitoring flight discovered that most cow-calf caribou had left the core area around Happotiyik Lake. At this time, post-calving movements were divided into a northern and southern component. Group composition was becoming increasingly mixed (i.e., cows, calves, yearlings, and bulls). On this date, John Russell (pers. comm.) located two groups. One group (5,000+ caribou) was heading north along the east shore of Kaminuriak Lake and had been previously seen around O'Neil, Victory, and Townsend lakes. The second group (2,000+ caribou) was just north of Maze Lake. In addition, the monitoring flight located over 9,000 caribou heading southeast along the southern shore of the Wallace River. The following day, John Russell and Steve

the protection area, its location is somewhat detached from the typical calving area around Kaminuriak Lake.

Post-calving Movements

From the time of calving until early July, cow-calf caribou slowly converged upon the area surrounding Happotiyik Lake, the same area previously described as having a medium density of calving caribou.

On 15 June, Kevin Biliquist (pers. comm.) made a low level flight between Rankin Inlet and Baker Lake. During this flight he saw only small groups of caribou (3-5 animals per group).

A 19 June monitoring flight located a large number of bull and yearling caribou between Carr and Maguse lakes.

A 20 June monitoring flight over the northern portion of the Kaminuriak Protection Area (while enroute to the Beverly herd) located small groups of bull and yearling caribou.

The first major post-calving movement was observed on 28 June. A group of cow-calf caribou estimated at 1,500+ had shifted north towards Duffy and Mandreville lakes. The high density core area of cow-calf caribou was still centered around Happotiyik Lake.

Kearny (pers. comm.) observed 50,000+ caribou widely distributed along the Hudson Bay coast between the Maguse and Wallace rivers. A large portion of this group was within the new 1987 addition to the Kaminuriak Caribou Protection Area.

Observations made while flying with John Russell on 13 July and on 14 July caribou monitoring flights indicated the 50,000+ caribou previously seen between the Maguse and Wallace rivers had moved northeast up the coast. Three distinct groups of caribou (estimated at 5,000+, 1,000+, and 3,000+ animals) were situated along the south shore of Dawson Inlet, outside the protection area (Figure 8). In addition, over 1,000 caribou were on the protection area boundary (around Nevill Bay) and two separate groups of 200 and 500 caribou were again outside the protection area in the vicinity of Mistake Bay. Caribou movements in the area of Nevill and Mistake Bays suggested they were moving south towards Dawson Inlet. The large group of caribou previously seen migrating up the east shore of Kaminuriak Lake had now reached the north end of the lake. In addition, groups of 200, 2,000+, and 3,000+ caribou were distributed around Kaminak Lake as were several small (1,000 caribou or less) groups of caribou around Derby Lake.

On 15 July, the large group of caribou previously seen at the top of Kaminuriak Lake had split into two distinct

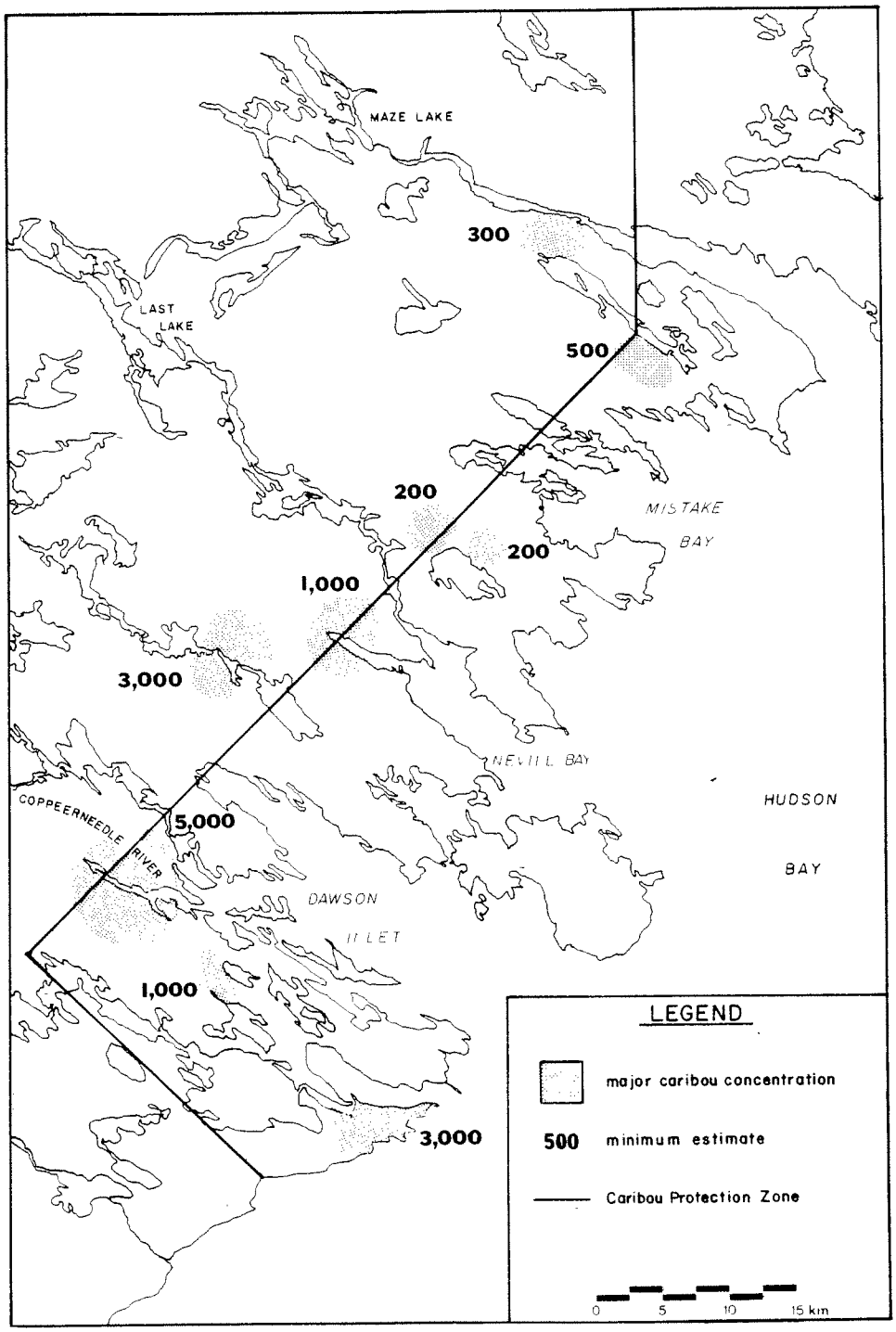

Figure 8. Distribution and minimum estimate of numbers of caribou along Hudson Bay coast (13 and 14 July).

groups; one was south of Blakely Lake, the second and larger group was distributed along the west side of MacQuoid Lake.

When the Caribou Protection Measures terminated on 15 July, it is likely that a large portion of Kaminuriak caribou, especially cow-calf caribou, were still within the protection area. Of all the collared caribou found at calving, only two had disappeared by 18 July (John Russell, per. comm.).

In excess of 10,000 caribou were migrating southwest along the southeast shore of Kaminak Lake on both 17 and 18 July (GNWT flight accompanied by the Caribou Monitor).

On 27 July, Roger Toews (pers. comm.) reported seeing a large group of caribou along the south shore of Baker Lake on both sides of the Kazan River. A similar movement was recorded last year when 10,000 caribou were widely distributed at the west end of Thirty Mile Lake (Liepins 1986).

In early August, up to 20,000 caribou were seen in the area of Eskimo Point (Ed Henderson, pers. comm., Larry Gray pers. comm.).

In summary, two major post-calving movements were evident (Figure 9). From mid-June until early July, cow-calf

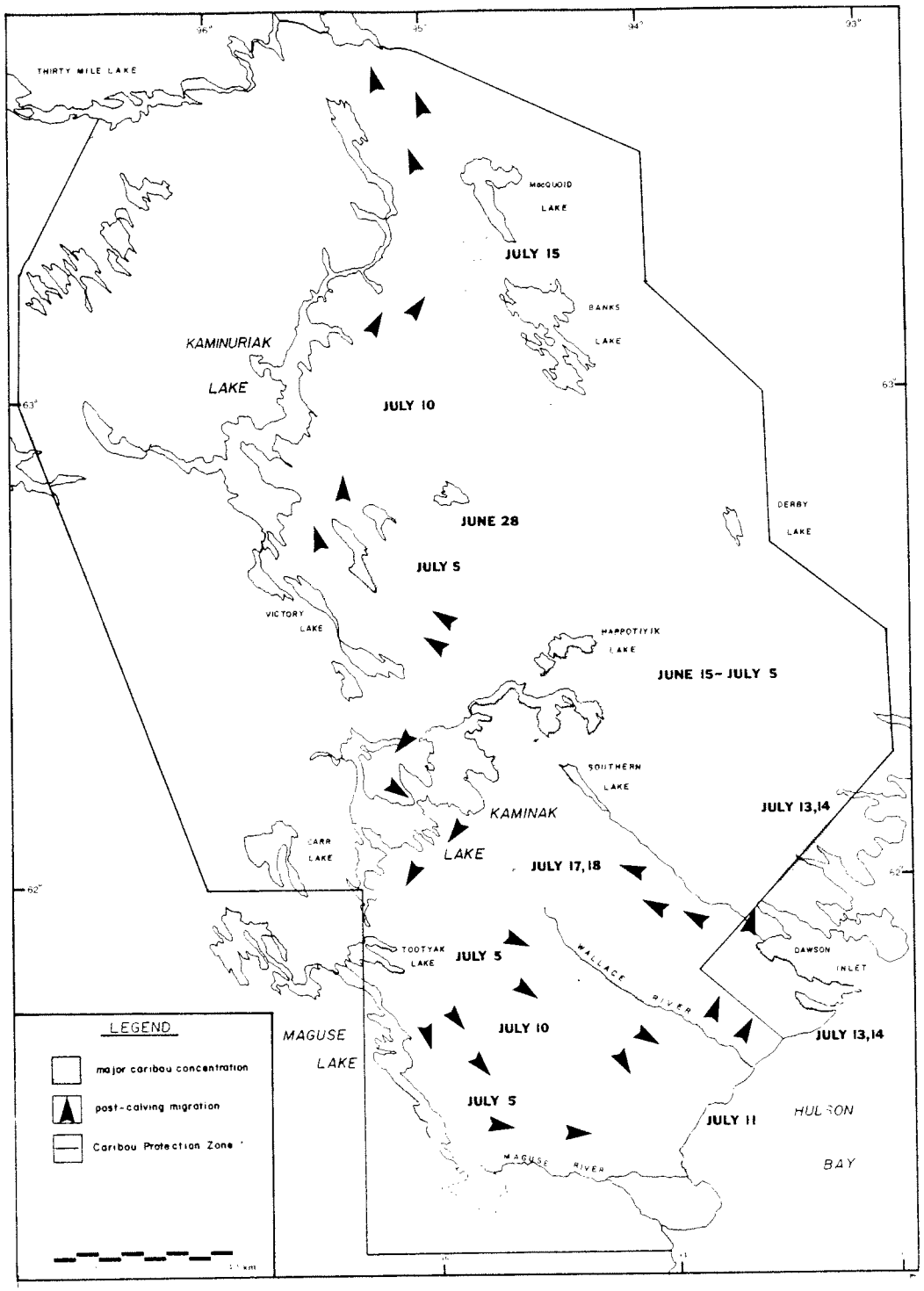

Figure 9. 1987 Kaminuriak caribou post-calving migration.

caribou converged upon the general area around Happotiyik Lake. By the first week in July, cow-calf caribou had split into northern and southern migrating groups. Essentially, the northerly migrating group travelled north to Baker Lake whilst the southerly migrating group circled widely before heading south parallel to the Hudson Bay coast.

Land Use Activity

Beverly Caribou Protection Area

There were no active land use sites within the Beverly Caribou Protection Area between 15 May and 15 July. During flights to the protection area, a collection of land use sites south of Schultz Lake (land use permit N87C744, N83C866, N86J563, and N83C866) were investigated for caribou activity. No caribou were found in the vicinity of these sites.

Kaminuriak Caribou Protection Area

Three requests for early release from the Caribou Protection Measures were received for land use sites within the Kaminuriak Caribou Protection Area (Figure 10).

On 14 May, Borealis Exploration Ltd. (land use permit N85C476) telexed INAC a request for an early release (Guy Sainte Andre, pers. comm.). Monitoring flights on the 15 and

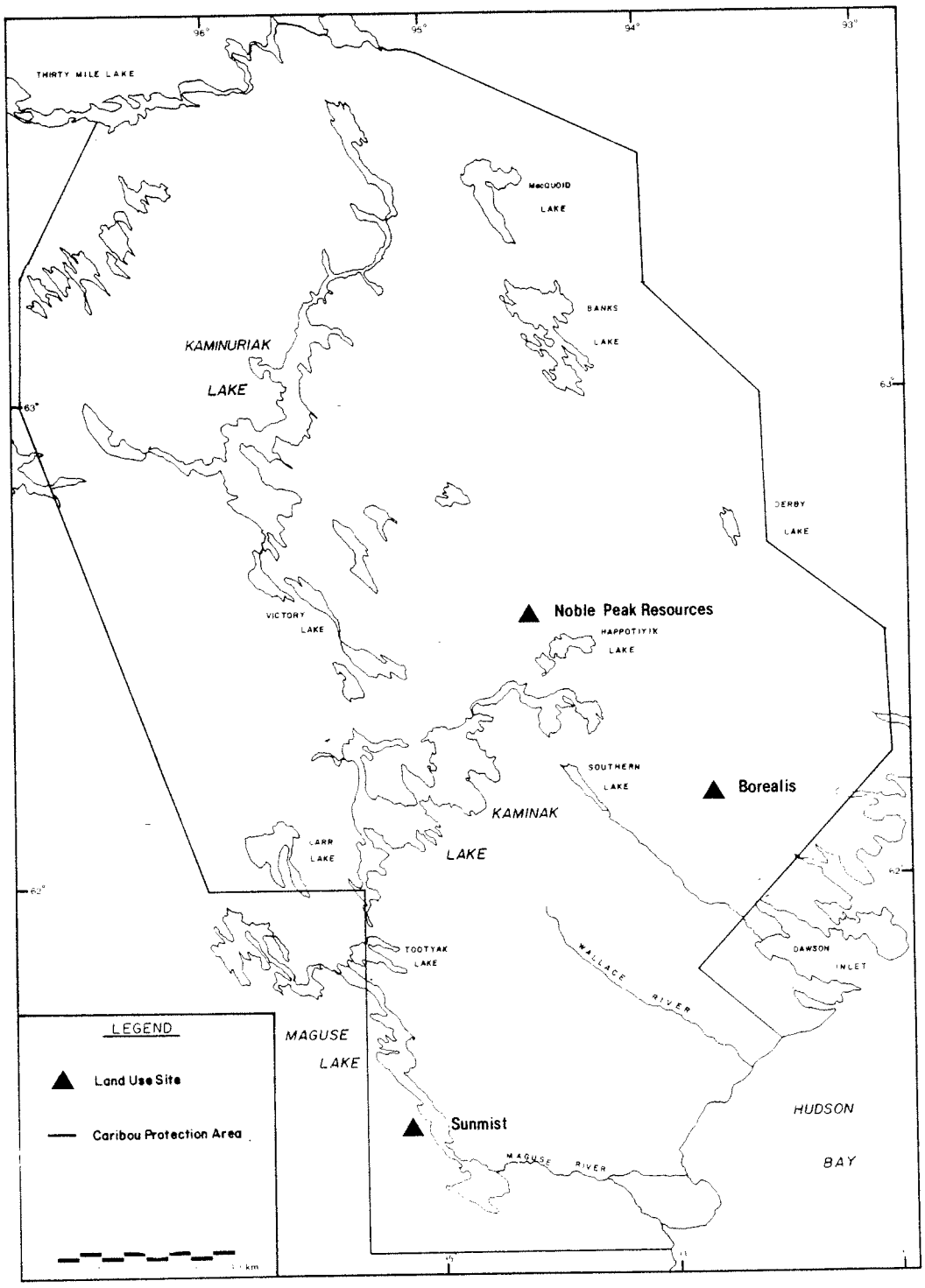

Figure 10. Active land use sites (1987) located within the Kaminuriak Caribou Protection Area.

21 May found no conflict between caribou and Borealis. A release was granted on 15 May. From 8 June to 10 July large numbers of cows and later cow-calf caribou were situated 18 to 27 kilometers northwest of the land use site. On the morning of 12 July, Borealis called Guy Sainte Andre (pers. comm.) and informed him that they had closed down because the camp was surrounded by caribou. The monitor accompanied a GNWT flight on 13 July and found the land use site clear of caribou. A monitoring flight on 14 July located two separate groups of caribou (300 and 2,000 animals) within 18 kilometers of the site. Closure of the site was not recommended on the basis that: 1) caribou had been highly mobile during the past 5 days and similar rates of movement were expected; and 2) there was only 24 hours before the protection measure expired.

On 15 May, in the absence of large numbers of caribou, a release was recommended and granted to Sunmist Energy Ltd. (land use permit N87N690) (Guy Sainte Andre, pers. comm.). From 15 May until 2 July, caribou remained a safe distance from the land use site. A 5 July monitoring flight discovered over 2,000 bull-yearling caribou within 8 kilometers (distributed along the southwest side of Maguse Lake) and a further 2,000+ cow-calf caribou within 18 kilometers (distributed along the northeast side of Maguse Lake) of the land use site. In addition, there was a large

group of cow-calf caribou to the north heading south directly towards the site. Closure of the land use site was recommended. Guy Sainte Andre (pers. comm.) contacted the company and instructed them to cease drilling within 24 hours, whereby the camp roster would be reduced from 12 to 5 personnel. The caribou had left the area by 10 July.

From 15 May large numbers of cows and later cow-calf caribou were located within 5 kilometers of Noble Peak Resources (NPR) (land use permit N86N579/N87C666). By 10 July, caribou had left the area and a release was recommended. On the morning of 11 July, Guy Sainte Andre (pers. comm.) notified NPR and granted them a release.

Water Crossings

In 1987, designated water crossings in the summer range of both Kaminuriak and Beverly caribou thawed in two stages. Water crossings south of 62° 00'N latitude did not become ice-free until late June or early July.

Beverly Caribou

Beverly caribou were not observed using any of the designated water crossings nor crossing any major water system.

Kaminuriak Caribou

Kaminuriak caribou were not observed using any of the designated water crossings. However, caribou were observed or were suspected to have been crossing at three non-designated points.

On 2 July, John Russell (pers. comm.) reported seeing thousands of caribou (mixed composition) crossing an arm of Kaminak Lake (Figure 11). An esker on either side of the crossing was acting as a natural trail leading to and from the crossing.

In addition, John Russell (pers. comm.) saw 1,000+ caribou (mixed composition) crossing near the southern-end of Kaminak Lake on 13 July (Figure 11). Also, extensive tracks/deep trails and the presence of large numbers of caribou on either side of the crossing indicated the crossing had been heavily used.

On 27 July, the presence of 10,000+ caribou along the south shore of Baker Lake suggests that caribou likely crossed the Kazan River at a point close to the lake although there were no direct observations.

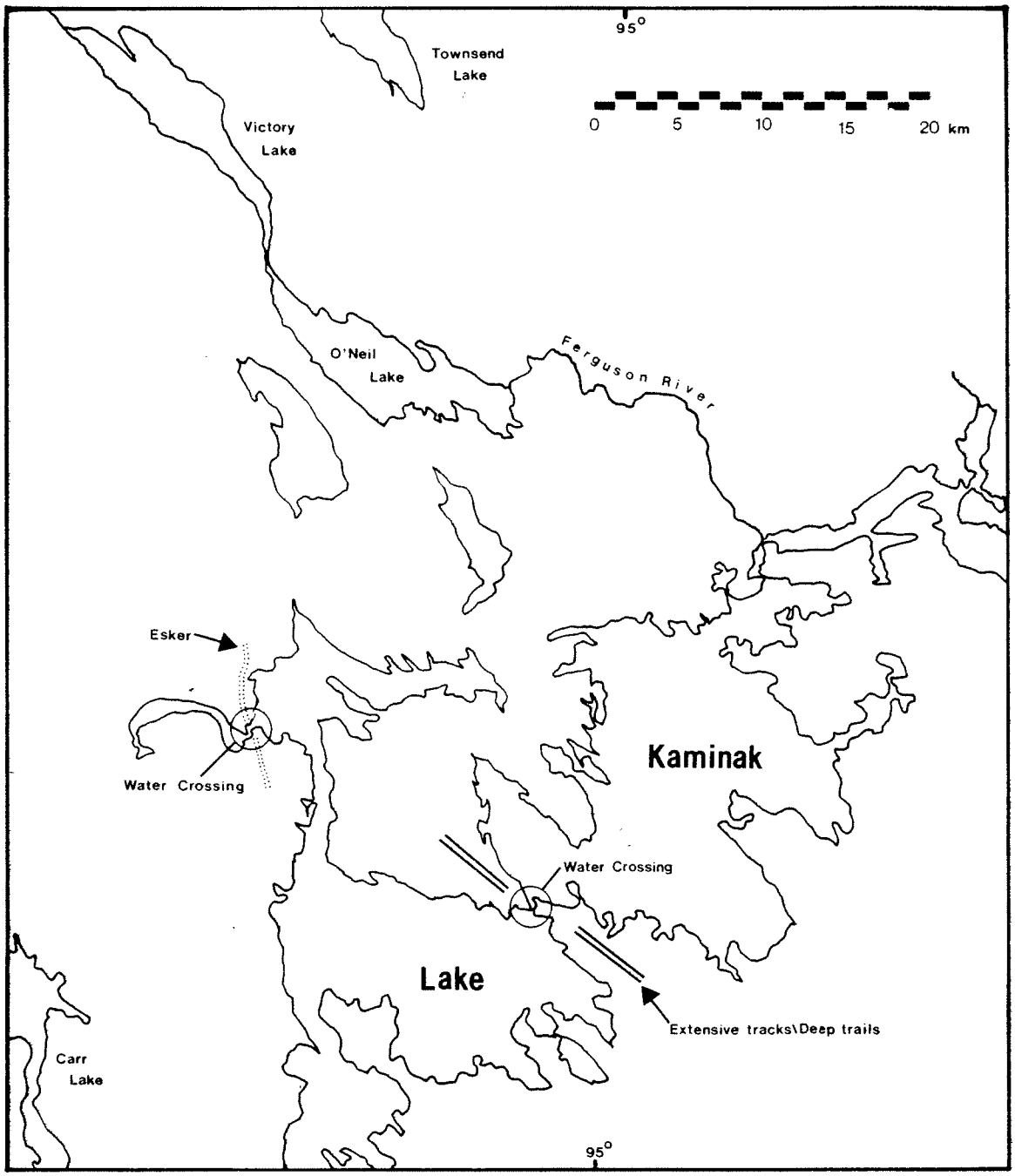

Figure 11. Non-designated water crossings in 1987.

RECOMMENDATIONS

Beverly Caribou Protection Area

The southern boundary, west of Sand Lake, of the Beverly Caribou Protection Area should be extended. Calving caribou were observed outside the present southern boundary in 1984 (Bradley 1985 & 1987).

Kaminuriak Caribou Protection Area

1) The southeastern boundary (along the Hudson Bay coast) of the Kaminuriak Caribou Protection Area, should be extended to include the coastal area around Dawson Inlet (Figure 8). Observations of large numbers of caribou and extensive tracks along the coast indicate that this area is commonly used by post-calving caribou.

2) The non-designated water crossing at the south end of Kaminak Lake has now been used in two consecutive years, 1986 and 1987 (Liepins 1986). This site should become a "designated water crossing" and added to the Kaminuriak Caribou Protection Area.

ACKNOWLEDGEMENTS

Funding for this program was provided by Indian and Northern Affairs Canada. I would like to thank Keewatin Air pilots John Jakubow and Kevin Biliquist for their cheerful assistance and many safe flights. Doug Heard, Gord Stenhouse, Robert Mulders, and Larry Gray provided advice and assistance during the month of July and the GNWT Beverly census project staff (particularly Larry Gray and Robert Mulders) provided detailed data on the Beverly caribou spring migration and calving grounds. Renewable Resources Officers Ben Kovic and Roger Toews helped with information on caribou movements, and Guy Sainte Andre and his staff assisted with their co-operation and cheerful help. A special thanks to my new-found-friends in Rankin Inlet for an interesting and exciting summer!

Lastly, I would like to thank Larry Gray, Steve Matthews, Doug Heard and Floyd Adlem for reviewing a draft of this report.

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APPENDIX A. The 1987 Caribou Protection Measures.

CARIBOU PROTECTION MEASURES
(KAMINURIAK AND BEVERLY HERDS)

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 the 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.

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.

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 the 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 Protection 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. Standard 1987 Caribou Monitoring Flight Report

Caribou Monitoring Flight Report

Date: Caribou Herd:
Flight Number:
Aircraft:
Observer(s):
Pilot:
Co-pilot:
Cloud Cover:
Visibility:
Temperature:
Wind:
Flight Altitude:

Land Use Activity

Snow Cover

Ice Conditions

Observations

Number correspond to observation points on the attached flight map.

Light tracks = less than 50 caribou travelled through the area.

Moderate tracks = 50 to 100 caribou.

Heavy tracks = more than 100 caribou.

Extensive tracks = many heavily used trails in the area.

Land Use Activity

Other Human Activity

Water Crossing

Summary

Flying time: