BEVERLY AND KAMINURIAK CARIBOU
MONITORING AND LAND USE CONTROLS
1989

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ABSTRACT

The Beverly and Kaminuriak caribou herds were monitored from 14 May to 15 July, 1989, to determine migration and calving areas in relation to the Caribou Protection Areas. Caribou monitoring flights were made to determine the presence or absence of caribou in the vicinity of specified land use operations to provide Indian and Northern Affairs Canada with information regarding caribou. This information is required to properly implement the Caribou Protection Measures

There were no active land use sites within the Beverly Caribou Protection Area between 15 May and 15 July. Within the Kaminuriak Caribou Protection Area there were eight active Land Use Permits. Requests for early release from the Protection Measures were received for six sites, involving four companies. With one exception, all releases were issued, for varying periods of time.

The Beverly herd cows arrived at their calving ground by migrating northward, into the Thelon Game Sanctuary, and then swinging to the east. A smaller number of cows entered the calving ground from the north, west or south. The calving ground spanned an area of 2040 km^2, with the eastern and southern limits demarcated by Sand Lake.

The Kaminuriak herd cows arrived at their calving ground by one of two major routes. Caribou moved into the Protection Area from the south, travelling northward past Maguse Lake or caribou entered the Protection Area from a more westerly direction, crossing Kaminak Lake, and continuing northeast to the calving ground. The calving ground covered 4370 km^2 and stretched from Banks Lake in the west, to the Protection Area Boundary in the east. Between 18 June and 4 July, a large portion of the cows moved towards the south and east to the Wilson Bay area, Hudson Bay. In early July the caribou began to move further south along the coastline and inland. A major portion of the herd also went north from the calving ground, and congregated at the Kazan River by mid-July.

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INTRODUCTION

The Caribou Protection Measures (Appendix A), were introduced by the Department of Indian and Northern Affairs (INAC) in 1978, largely as a result of concerns raised by native groups. In the mid 1970s, local residents felt that the Kaminuriak and Beverly caribou herds (Rangifer tarandus groenlandicus) were abandoning areas of traditional use, especially water crossings, due to increasing exploration activities. The Caribou Protection Measures address land use activities in areas used by caribou cows and/or cows and calves. Descriptions of caribou cow and calf behaviour during calving and post-calving (Gunn 1984) indicate that disturbance from human activity should be minimized in the vicinity of cow-calf concentrations.

Since 1978, INAC has provided 50K per annum to the Government of the Northwest Territories (GNWT), to conduct the caribou monitoring program. Between 1978 and 1980, no land use activity was permitted in the Protection Area between 15 May and 31 July, and monitoring flights were primarily concerned with gathering information on migration routes and calving ground location.

Since 1980, regulatory change has permitted land use activities during the protection period if a company has been granted permission, by INAC, to operate within the Protection Area. For the purpose of this report, the granting of such

permission is referred to as a "release". Since 1983, the protection period has been 15 May through 15 July. The 1989 Protection Area boundaries are indicated in Figure 1.

The change in the protection period did not alter the goal of reducing the potential for interaction between caribou and exploration activity, but did influence the priority with which objectives were viewed. Since 1980, most monitoring has been in the form of reactive surveys to determine whether or not land use releases should be granted.

Land use activities outside the Protection Area boundaries are allowed during the 15 May through 15 July period if no significant numbers of caribou encroach upon the land use site. If caribou calve outside of the Caribou Protection Areas the Caribou Protection Measures requires permittees suspend operations. No release is needed for these sites to be in operation.

A secondary, but important, aspect of the program is to continue monitoring spring migration, calving and post-calving movements of the Beverly and the Kaminuriak caribou herds. Information regarding caribou movement and calving grounds will allow re-assessment of the Protection Area boundaries with respect to the current patterns of migration and distribution.

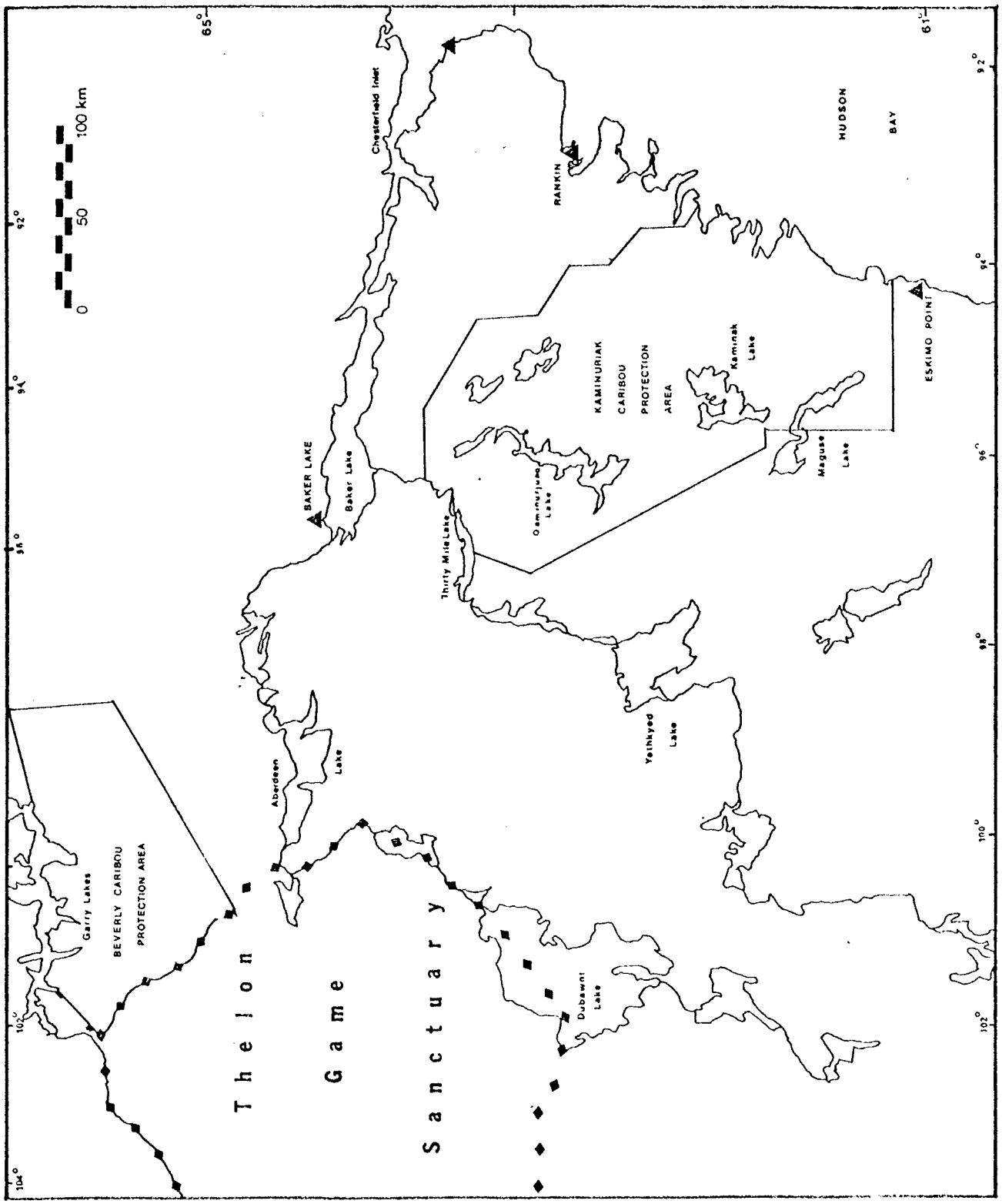

Figure 1. Beverly and Kaminuriak Herd Caribou Protection Areas, Keewatin Region, 1989

METHODS

Since the inception of the monitoring program, two primary sources of information for the Caribou Monitor have been aerial surveys and communication with various organizations and individuals. The Monitor utilized information provided by GNWT Renewable Resource Officers and biologists, hunters, local people and INAC personnel.

Flight paths for the 1989 monitoring flights were determined with the following objectives, in order of priority:

1) specific land use operations as determined by INAC, usually those sites requesting, or under, release;
2) active land use sites within the Protection Area;
3) recent observations and reports of caribou movements;
4) historical patterns of movement; and
5) land use activities outside the Protection Area.

All flights were conducted in a modified Beech-18 (Tradewinds) aircraft equipped with an Omega navigation system. The Omega provided accurate navigation while allowing maximum observer effort to be directed towards observation of land use and caribou activity. The Omega was particularly useful up to mid-June, the period when snow cover made visual navigation difficult.

Cruising speed of the Tradewinds aircraft was usually 300 km/hour, with slower speeds of 230 km/hour used when necessary. Flights were generally conducted at an altitude of 300 m AGL,

although on several occasions altitudes as low as 200 metres AGL were required either because of weather conditions, or in order to determine accurately the sex and age class of caribou. Guidelines regarding flights at less then 300 metres AGL are provided in Darby and Williams (1979).

The Department of Renewable Resources placed radio transmitters on cows from the Kaminuriak herd in November 1984 and October 1986 (D. Heard pers. comm.). As a portion of these collars were still active, high altitude flights of 2460 metres AGL were conducted on 10 June and 1 July to locate collared cows to assist the monitor in locating large concentrations of cows during calving and post-calving. The Regional Biologist and the Wildlife Technician, GNWT, Keewatin Region, accompanied the monitor on the 10 June and 1 July flights, respectively.

On 10 June, following determination of the location of the Kaminuriak calving ground, as indicated by radio signals, structured low level (300 m AGL) flight lines were followed to estimate the boundary of the calving ground and to determine caribou density. The Beverly calving ground was roughly delineated by following a number of pre-determined low level flight lines over the Protection Area.

During monitoring flights, the following were recorded whenever possible:

1) visual estimates of caribou numbers, group composition (i.e., cows, calves, yearlings and/or bulls), and direction of movement;

2) caribou tracks, their orientation and a rough estimate of the number of caribou which had passed through an area;

3) land use activities;

4) changes in snow and ice conditions, as well as weather, during the flight; and

5) occurrence of other wildlife.

On most flights, assistant observers accompanied the Monitor. Observers included GNWT and INAC employees, and members of the local Hunters' and Trappers' Association (HTA). Pilots contributed wildlife sightings during the monitoring flights.

A verbal report was given to the INAC District Manager in Rankin Inlet immediately following monitoring flights. This was followed within 24 hours by a written report, using a standard reporting sheet (Appendix B). Copies of flight reports were also provided to the Regional Biologist, Keewatin Region. The Monitor provided recommendations regarding any potential conflict between land use activity and caribou, based on whether or not 1000 or more caribou, regardless of age class and sex, were within a 10 km radius of a land use site (Darby and Williams 1979).

In addition to the GNWT chartered flights, the Caribou Monitor accompanied INAC on 8 July, during their land use site inspection tour conducted by helicopter. On 10 July, and again between 18 July and 1 September, INAC personnel conducted additional land use inspections by helicopter and relayed information to the Caribou Monitor regarding caribou movements

noted during those flights. Information collected by INAC and Renewable Resources staff was relayed to the Caribou Monitor until 15 August, 1989.

RESULTS AND DISCUSSION

Total flying time in the tradewind aircraft was 33.2 hours. One flight lasting approximately 4.5 hours was conducted over the Beverly herd area (Figure 2), and the remaining 28.7 hours comprised 14 flights over the Kaminuriak herd (Figures 3 and 4). The Beverly herd flight was part of a 6.7 hour flight on 10 June to assess both the Beverly and Kaminuriak calving ground areas. Rationale for all flights associated with the Kaminuriak caribou herd is provided in Appendix C. A higher portion of flying time (77.4%), was allocated to the calving and post-calving periods, critical times for the cow-calf relationship.

Beverly Caribou

The lack of development and/or exploration activities in the Beverly Protection Area, necessitated only one flight being made over the area. Unlike previous years (Bradley and Gates 1984; Bradley 1985; Duquette 1985; Ogilvie 1987, 1989), there were no simultaneous studies by GNWT, or other government agencies, to contribute information on herd movements or calving ground location. As a result, there is limited information for the Beverly herd.

Spring Migration

On 12 May caribou were congregating in the Thelon Game Sanctuary and were beginning to head northward (R. Bourget pers. comm.). Smaller numbers of caribou which wintered in the

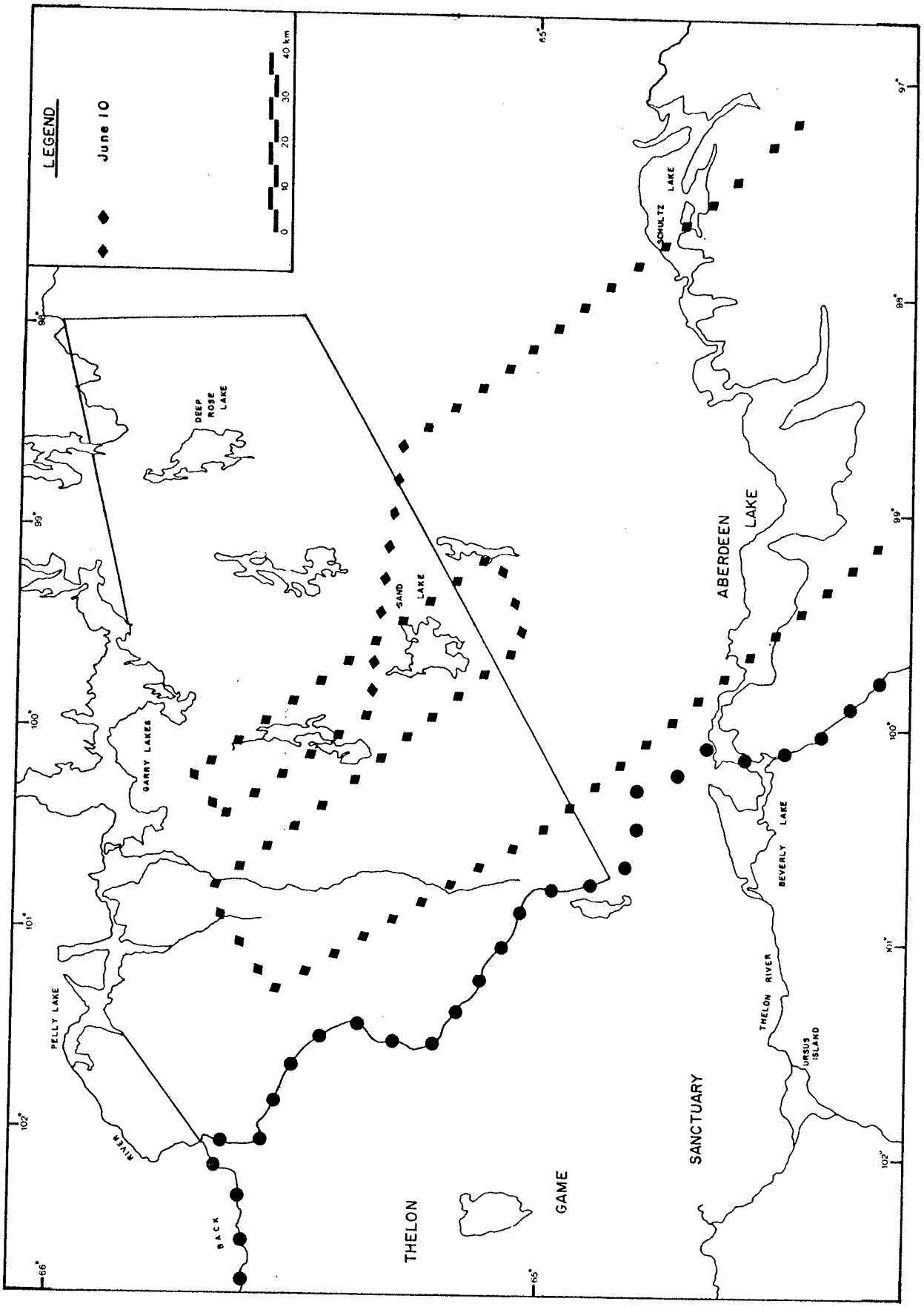

Figure 2. Caribou Monitor Flight Path Conducted over the Beverly Caribou Protection Area, 1989.

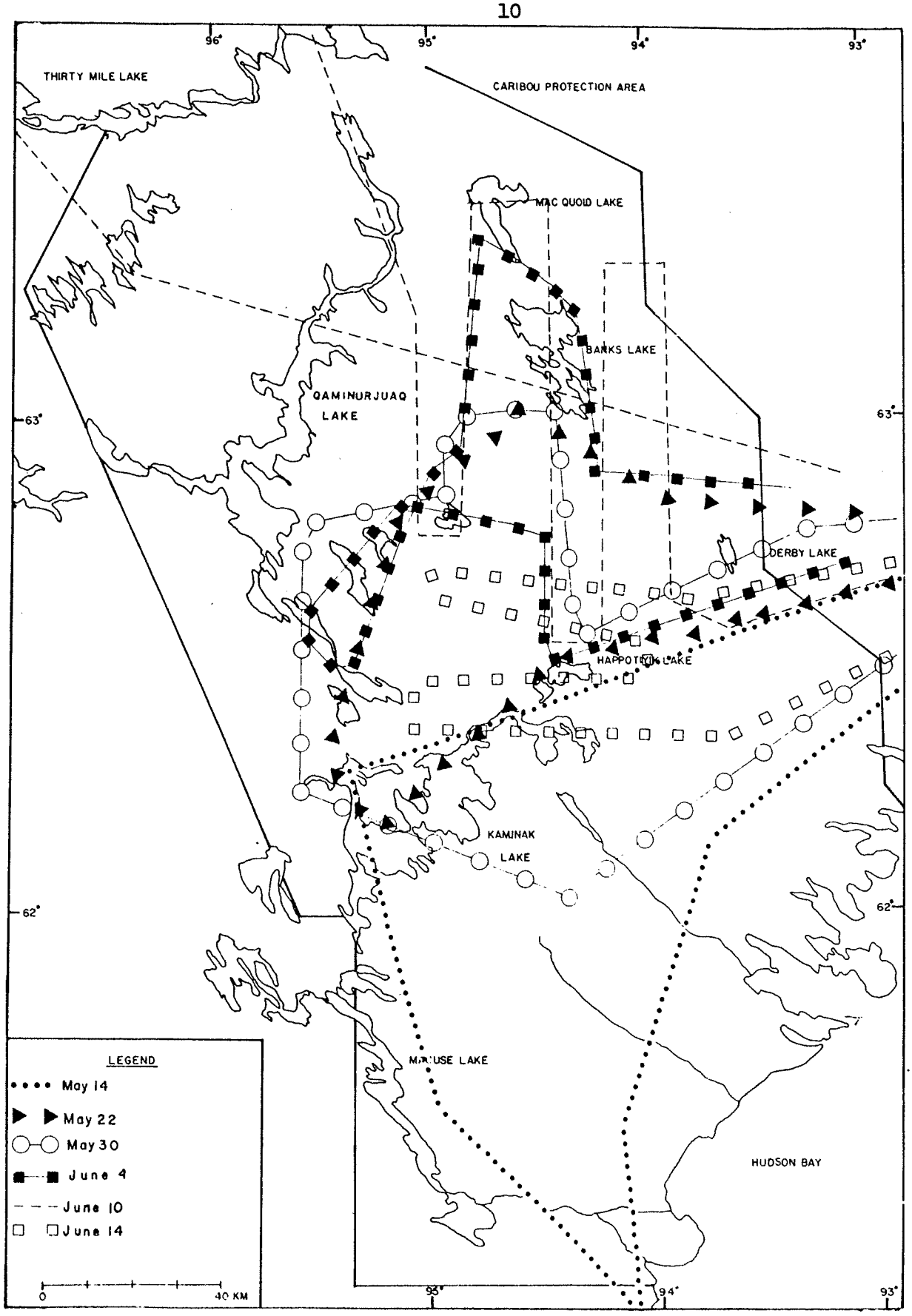

Figure 3. Caribou Monitor Flights Conducted over the Kaminuriak Caribou Protection Area, 14 May to 10 June, 1989

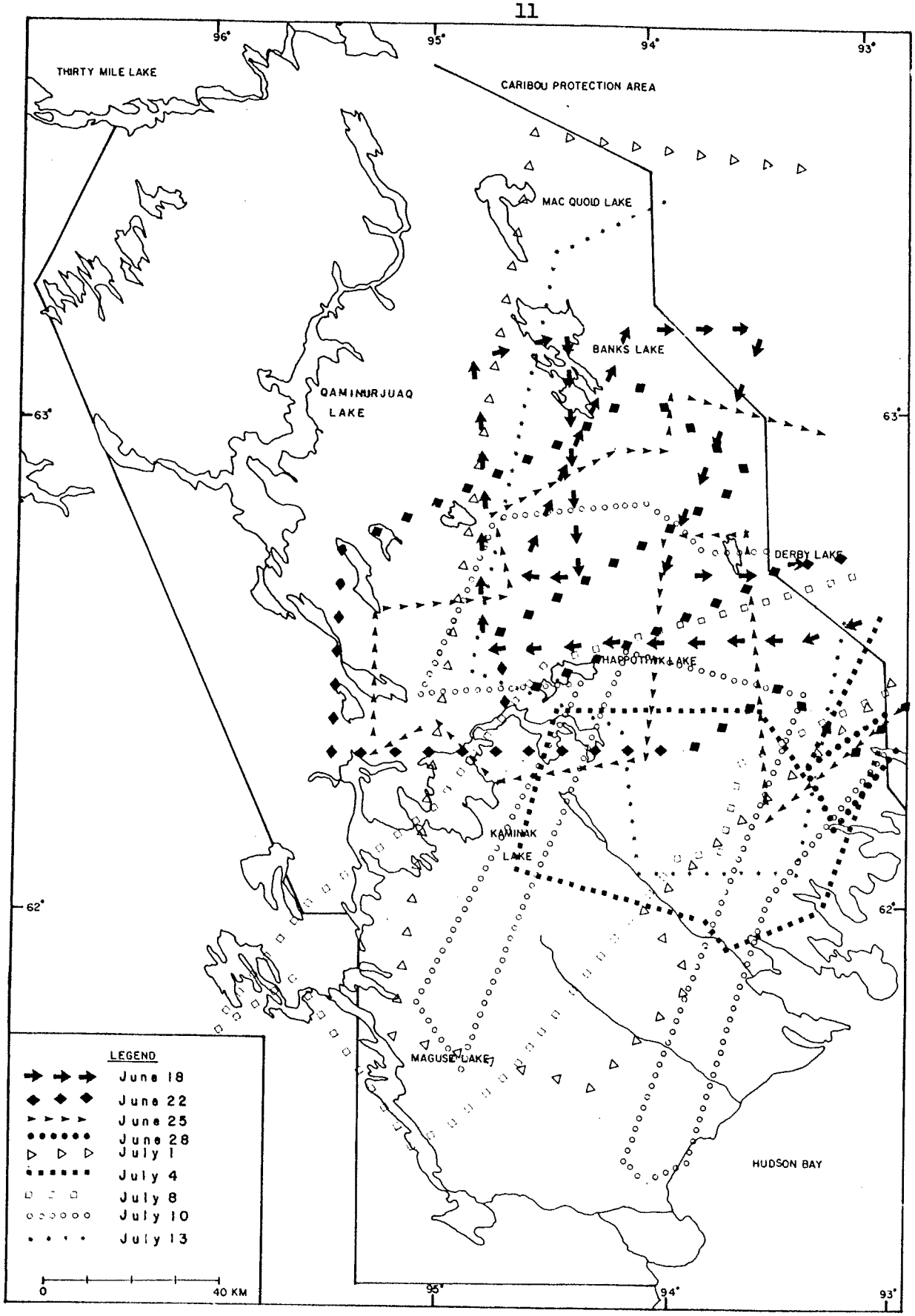

Figure 4. Caribou Monitor Flights Conducted over the Kaminuriak Caribou Protection Area, 13 June to 13 July, 1989.

Shultz Lake area had not begun to migrate to the north as of 25 May (J. Niego pers. comm.). During May, hunters from Baker Lake reported taking caribou from south of Princess Mary Lake (J. Niego pers. comm.), but it is not known whether or not these caribou eventually migrated into either the Kaminuriak or Beverly caribou protection areas.

During the flight over the Beverly Protection Area, to the east of the Thelon Game Sanctuary, there were consistent sightings of either caribou travelling towards the east, or moderate/heavy east-west orientated caribou trails, between 65°00'N and 65°25'N (Figure 5). This migration route, north through the sanctuary and then east to the calving ground, has been similar for the past 10 years (Darby 1980; Cooper 1981; Clement 1982, 1983; Bradley and Gates 1984; Bradley 1985; Duquette 1985; Liepins 1986; Ogilvie 1987, 1989).

In addition to the major spring migration, sightings of smaller numbers of caribou or light trails suggested some migration into the calving area from the northeast and northwest, as well as from the south (Figure 5). These caribou may represent small concentrations which wintered in areas away from the main herd, or individual animals which migrated past the calving ground and entered from another direction. In 1986 some caribou initially bypassed the calving ground and circled in from the north (Liepins 1986). In 1985 a major migration of Beverly caribou entering the calving ground from the north (Duquette 1985).

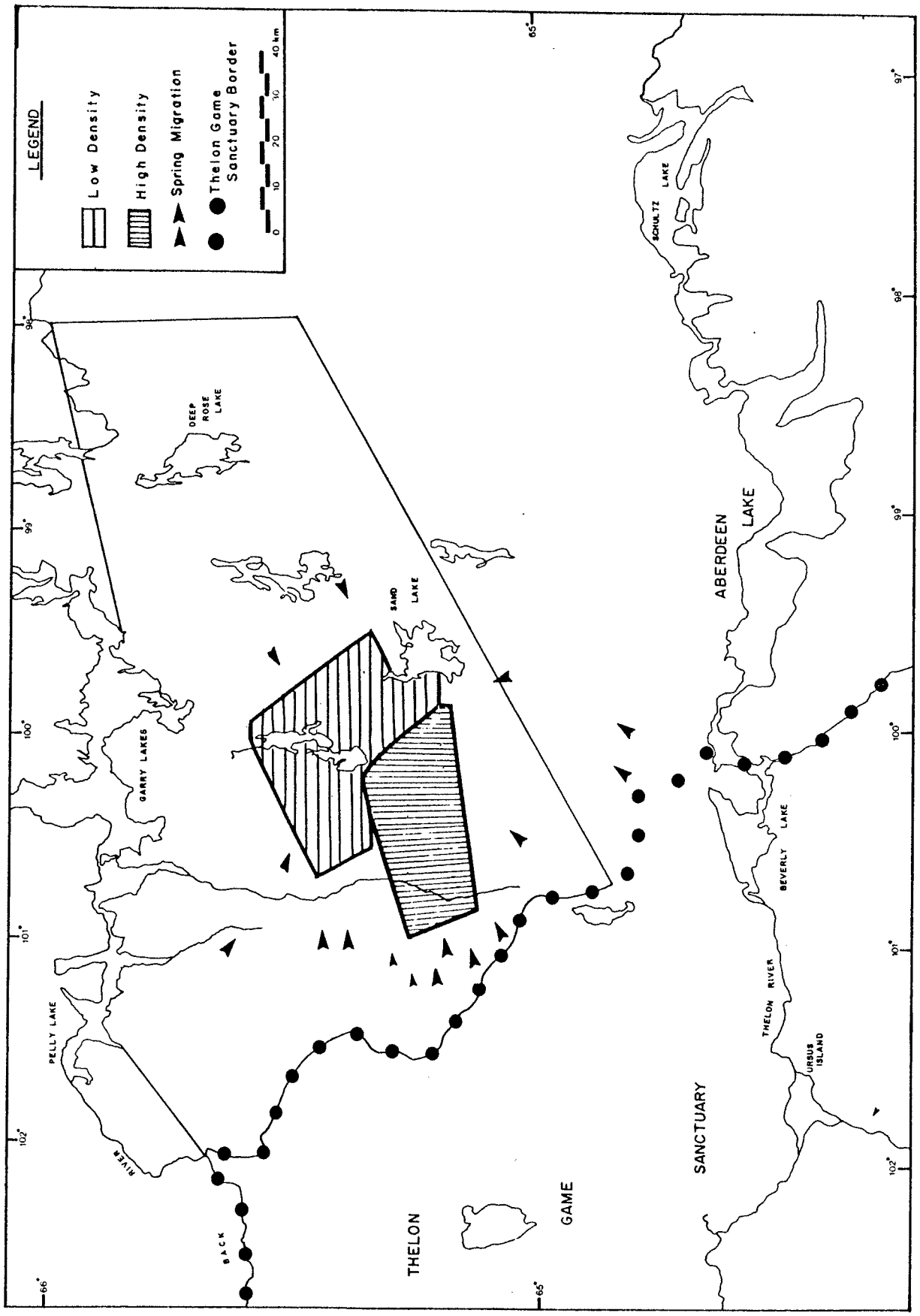

Figure 5. Beverly Herd Spring Migration Route and Calving Ground, Keewatin Region, 1989.

Calving Grounds

The Beverly herd was monitored on 10 June. Based on the small number of calves seen, it can be assumed that calving was just beginning. Numerous caribou were still migrating toward the core calving area.

The calving ground covered approximately 2040 km^2, with a higher density of caribou concentrated in a 888 km^2 area in the southwest portion of the calving ground. The calving ground extended from the northern tip of a major unnamed lake complex ($65^{o}30'N$, $100^{o}10'W$) in the north, as far south as the southern tip of Sand Lake (Figure 5). The calving area was similarly located in 1980, 1986, 1987 and 1988 (Cooper 1981; Liepins 1986; Ogilvie 1987, 1989).

Post-Calving Movements

One report concerning post-calving movements of the Beverly caribou herd was made. Canoeists reported approximately 1000 cows with calves at the junction of the Thelon River and Hornby Point, in late July/early August (R. Bourget pers.comm.)

Kaminuriak Caribou

Spring Migration

The major part of the Kaminuriak herd is believed to have wintered in the Nueltin and Watterson lakes areas, with some caribou scattered throughout northern Manitoba (J. Savikataaq

pers. comm.). Small numbers of caribou wintered in the Baker Lake area (R. Bourget pers. comm.), but are likely part of the Wager Bay herd (D. Heard pers. comm.). Caribou seen south of Princess Mary Lake and in the Aberdeen/Schultz lakes area could have migrated in the spring to either the Beverly or the Kaminuriak herd calving area (R. Bourgette pers. comm.). Renewable Resource Officer D. Workman (pers. comm.) advised the Caribou Monitor that some caribou were scattered within an 80 km radius of Rankin Inlet during the winter.

Between 6 April and 14 April, 1989, Renewable Resource Officers from Arviat (formerly Eskimo Point), conducted a spring classification count in the vicinity of Hurwitz Lake. Approximately 9000 Kaminuriak caribou were classified, and an estimated ten times that number of caribou migrated north during that period. The largest concentrations of caribou were around Tatinnai Lake (B. Kovic pers. comm., J. Savikataaq pers. comm.). Caribou are believed to have continued northward, crossing Maguse Lake.

The major spring migration is similar to that reported almost on an annual basis since 1979 (Bradley and Gates 1984, Bradley 1985, Duquette 1985, Liepins 1986, Ogilvie 1987). A deviation from this typical pattern did occur in 1981 and 1982, when a major portion of the herd wintered to the north of the calving area and so entered from a northern origin (Clement 1982, 1983).

In 1989 a second major migration route was recorded. Some caribou moved into the Protection Area from a more westerly

origin, and crossed Kaminak Lake. Similar caribou movement was documented in 1983, 1985, 1986, and 1987 (Bradley and Gates 1984, Duquette 1985, Liepins 1986, Ogilvie 1987).

At the beginning of May local hunters reported that there were thousands of caribou approximately 40 km inland from the Hudson Bay coast, between Maguse Lake and the Wallace River (H. Kablalik pers. comm.). In mid-May, at least 1000 caribou were in the Southern Lake/Copperneedle River area (H. Kablalik pers. comm.).

Unlike seven of the past nine years, 1979, 1982, 1983, 1984, 1986, 1987, and 1988 (Darby 1980; Clement 1983; Bradley and Gates 1984; Bradley 1985; Liepins 1986; Ogilvie 1987, 1989), large numbers of caribou did not migrate close to the Hudson Bay coast, past Arviat. In 1989 the caribou were further inland then expected, and were later than normal in their arrival at the Protection Area (J. Savikataaq pers. comm.).

Flights conducted between 14 May and 31 May showed relatively low numbers of caribou (average of 179 caribou per flight) in the Happotiyik Lake area travelling northward, and in the Kaminak Lake area travelling in a northeasterly direction (Figure 6). Migration through the Happotiyik Lake area was observed in 1986 and 1987 by Liepins (1986) and Ogilvie (1987), respectively, and in 1988 Happotiyik Lake was in the middle of the calving ground (Olgivie 1989).

Caribou also migrated into the Protection Area from the west, between Kaminak Lake and the southern tip of Qaminurjuaq Lake

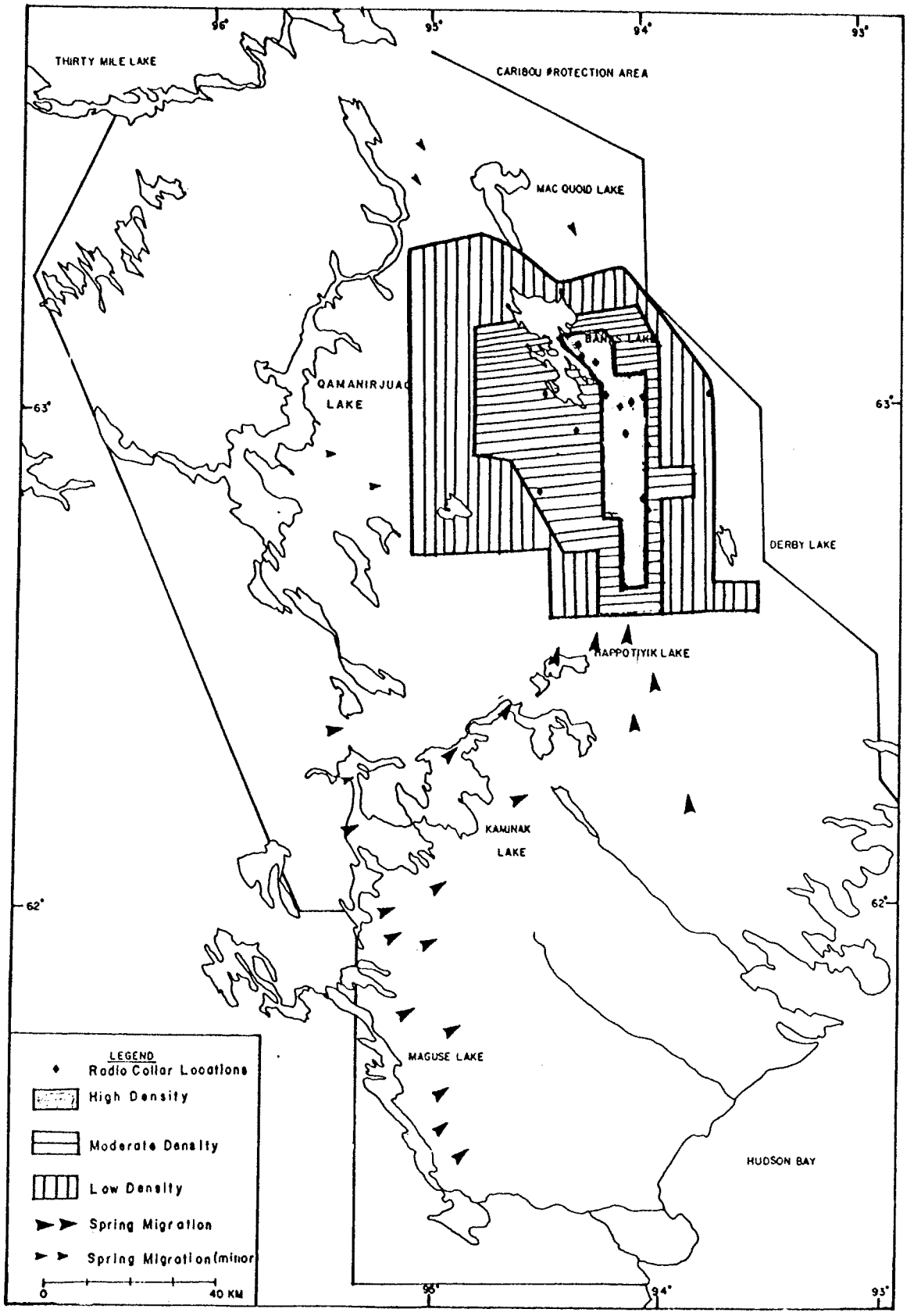

Figure 6. Kaminuriak Herd Spring Migration Route and Calving Ground, Keewatin Region, 1989.

(formerly Kaminuriak Lake). Small numbers of caribou entered the calving ground from the north, travelling between MacQuoid Lake and the northern end of Qaminurjuaq Lake (Figure 6). Low numbers were reported migrating in from the north in 1986 (Liepins 1986) and more major concentrations of caribou entered the calving area from the north in 1981 and 1982 as a result of their wintering north of Chesterfield Inlet in those years (Clement 1982, 1983) .

In summary, there were two major spring migration routes in 1989. Caribou either migrated northward through the Maguse Lake area and continued past the Happotiyik Lake area, or entered the Protection Area from the southwest, migrating through the Kaminak Lake area.

Calving Grounds

On 22 May fewer caribou were seen in the area just to the north of Derby Lake than around Happotiyik and Kaminak lakes, whereas by 31 May, over twice as many caribou were sighted in the Derby Lake area than around the more southerly lakes. By 5 June, almost no caribou where observed around Kaminak and Happotiyik lakes.

On 10 June, the initial flight over the Kaminuriak herd, 14 radio collared animals were located between the Protection Area boundary in the east and Banks Lake in the west (Figure 6). Radio telemetry data and visual observation of caribou indicated that the Kaminuriak calving ground extended from Mandreville Lake in the west to MacQuoid Lake in the northeast and Derby Lake in

the southeast (Figure 6).

Based on a visual strip census, the calving ground was stratified into high, medium and low density areas of 525 km^2, 1400 km^2 and 2460 km^2, respectively (Figure 6). The high density area was east of Banks Lake and extended as far south as $65^{o}30'N$ (Figure 6). In 1979 (Darby 1980), 1984 (Bradley 1985) and 1988 (Ogilvie 1989), the western limit of the calving ground extended as far as the west shore of Banks Lake. Part of the calving ground also touched Banks Lake in 1987 (Ogilvie 1987).

During the 10 June flight it was estimated that 30 - 50% of the cows had calved. On 8 July, assessment of three separate cow/calf groups indicated that 75-85% of the cows were with calves.

Post-Calving Movements

On 18 June, approximately 6000 cows, in three groups, had congregated around the Banks Lake area. A second, larger concentration of caribou (an estimated 65000 cows), was observed between Derby Lake and the large unnamed lake complex 30 km to the north ($63^{o}00'N$, $93^{o}40'W$). These animals, comprising seven large groups, each consisting of thousands of caribou, were in the area that had been the southeast portion of the calving ground (Figure 7). Smaller satellite groups, with hundreds of caribou per group, were frequently observed to be travelling at a fast pace toward the larger groups. The large concentrations of

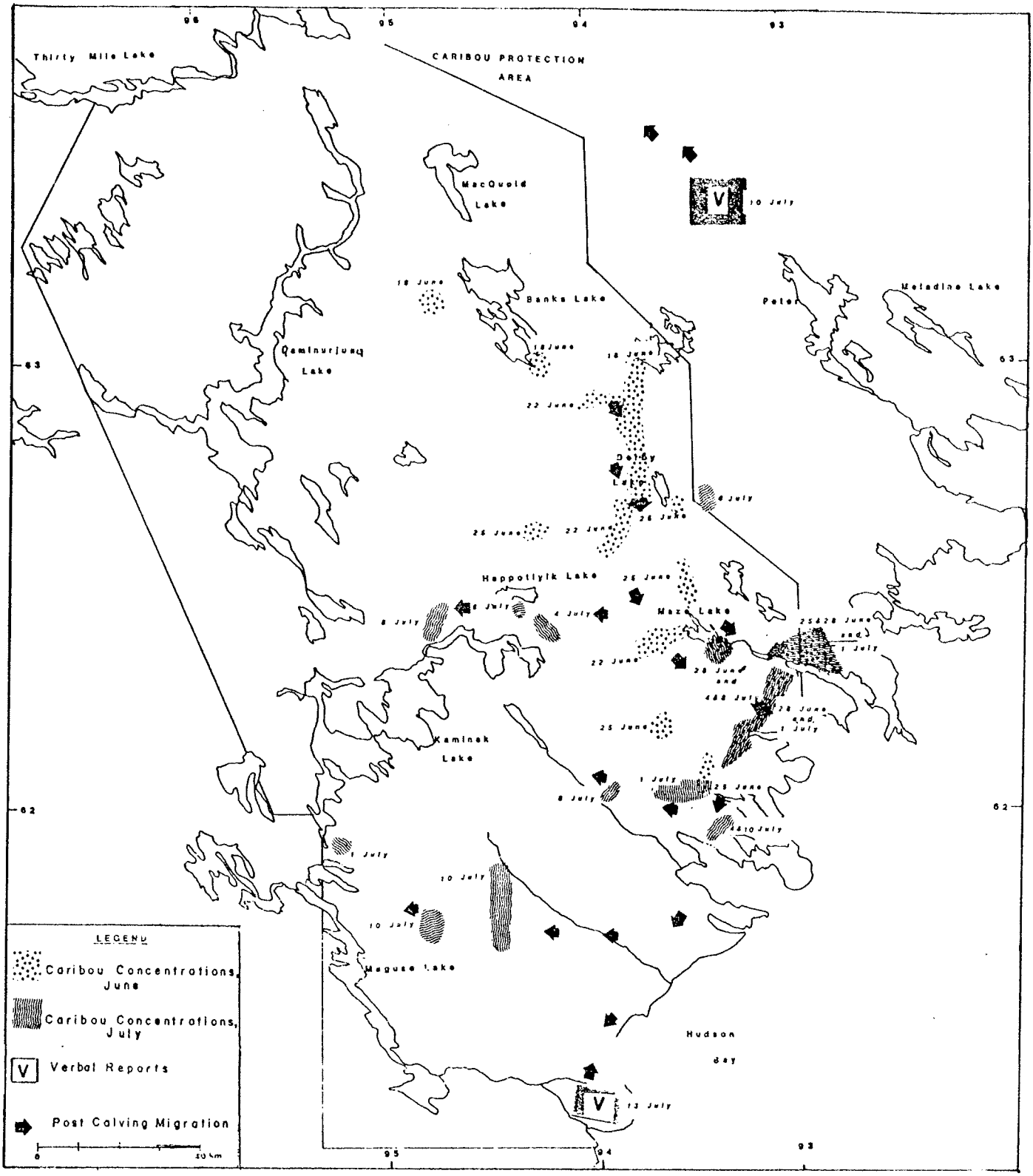

Figure 7. Major Post-Calving Migration Movements and Concentrations of Caribou, Keewatin Region, 1989

caribou were either milling about, or slowly moving in a southerly direction.

By 22 June, 17000 caribou were still in the area surrounding Derby Lake and the lake 30 km to the north, and large numbers of caribou (an estimated 28000) were as far south as Maze Lake. No significant numbers of caribou were seen in the area immediately south of Banks Lake. On 25 July large numbers of caribou remained in the Maze Lake area, as well as further south and east of the lake.

A short flight over the Wilson Bay area on 28 June revealed that more caribou had moved into the coastal area, with an estimated 25000 caribou being between Maze Lake and Mistake Bay (Figure 7). Despite an inability to observe the Wilson Bay coastline on 1 July, due to fog, significant numbers of caribou are believed to have remained in the area through to that date. All five radio signals identified during that date's flight were located in that area. During the same flight, improved visibility in the Mistake Bay area allowed visual observation to be made of an estimated 9500 caribou.

Also on 1 July, 1000 adult caribou were located near the western border of the Protection Area. In addition, a number of groups, consisting of hundreds of individuals each, were seen north of Maguse Lake, travelling in a northeasterly direction. Of those in the Maguse Lake area, one group of 700 caribou appeared to be composed wholly of bulls. Relatively small groups of caribou were also seen between Maguse and Kaminak lakes.

The northern portion of the Kaminuriak Protection Area was surveyed on 1 July, with radio tracking equipment in operation, to locate additional concentrations of migrating cows. A high level flight over Duffy Lake, north to MacQuoid Lake, east to Chesterfield Inlet and south across Madeline Lake to Rankin Inlet did not intersect any radio collar signals.

By 4 July there were no caribou in the Wilson Bay area. Further south, around Dawson Inlet, there were an estimated 3500 cows (Figure 7). An estimated 9000 caribou were sighted in the Happotiyik and Maze lakes areas.

During a helicopter survey flight on 8 July, 2500 caribou, 10% of which were bulls, were observed at the Borealis site, Fat Lake, heading towards the west. Approximately 75% of the cows were with calves. An additional two groups, each comprising approximately 1500 cows, were seen in the Happotiyik Lake area. Between 75 and 85% of the cows had calves and there were no bulls associated with either group. Utah Mines reported that 1000 caribou had passed their site on 6 July, heading in a easterly direction, and that bulls were the major constituent of the group.

The 10 July flight covered the coast line from Rankin Inlet to Austin Island and few caribou were seen, although approximately 15500 caribou were observed inland, between Maguse Lake and Wallace River. On two occasions it was confirmed that calves were present in the group. It is not known whether or not bulls accompanied the groups. No caribou were seen in the areas

around Duffy and Derby lakes. Several thousand caribou were in the vicinity of Austin Island on 13 July (M. Bradley pers. comm).

On 10 July, a major portion of the Kaminuriak herd was reported northwest of Peter Lake (H. Kablalik pers. comm.). An estimated 70000 caribou were reported to be at the Kazan River, just west of Martell Lake, on about 20 July, by Renewable Resource Officer J. Niego.

In mid-July thousands of caribou, of mixed sex and age classes, were in the Ferguson Lake vicinity (S. Mitchell pers. comm., D. Oolooyuk pers. comm.)

The large migration to the coast, followed by splitting of the herd into two major groups, one of which continued to the south and then inland, and another which swung to the north, is similar to that which occurred in 1988 (Ogilvie 1989). As in 1988, the northern portion of the herd collected outside the Protection Area and then crossed the Kazan River.

Large numbers of caribou were outside the Protection Area boundary, in the Wilson Bay area of the Hudson Bay coast, for at least 10 days. Caribou seemed to have moved out of that area by 4 July with thousands of cows subsequently seen to the south. On 10 July large concentrations, an estimated 15500 caribou in total, were seen inland, north of Maguse Lake.

LAND USE ACTIVITY

During the 15 May to 15 June 1989 protection period there were 21 active land use permits authorizing companies to conduct operations in areas which could potentially be used by the Kaminuriak or Beverly caribou herds. Eight permits were for sites within the Kaminuriak Protection Area; twelve permits pertained to sites located outside the Kaminuriak and Beverly protection areas, and one permit was for a company based in Arviat which conducted work throughout the Keewatin Region (Table 1).

Beverly Caribou Protection Area

There were no land use permits in effect for the Beverly Protection Area during the 1989 protection period. There was one permit issued to Urangesellschaft, which operated south of the Protection Area (Figure 8). The operation at this site was survey oriented and came into effect as of July, 1989.

Small groups of caribou frequently winter in the area around Schultz and Aberdeen lakes, and could still be near any of the eight land use sites in that area at the beginning of the protection period, prior to the onset of spring migration. It is likely that land use activity occurred at each site (S. Mitchell pers. comm.), but potential for conflict situations was not determined since monitoring flights were not conducted there. With the exception of Geological Survey Canada, drilling was a

Table 1. Active Land Use Sites within or near the Caribou Protection Area, 1989

PERMIT# exp. date	COMPANY	LOCATION	LAND USE ACTIVITY
KAMINURIAK HERD VICINITY			
*N87C666 05/89	Noble Peak Resources(NPR)	62°33'/94°32'	cleanup of site
N87D797 09/89	Borealis	62°08'/93°50'	mining
*N88C023 02/90	Sikaman Gold Resources	62°15'/95°10'	exploratory drilling
N88F034 12/90	Eskimo Point Lumber	Eskimo Point	Drive to mining sites to provide "clean-up" and delivery service
*N88C908 04/90	Utah Mines Ltd.	61°54'/95°28'	mineral exploration; geological mapping; prospecting; sampling
*N88J916 06/90	Geological Survey (GSC)	62°17'/93°22'	bedrock mapping
N88C926 09/89	Inco Gold	62°27'/93°00'	diamond drilling; geological/geophysical surveys; prospecting
N88N935 09/89	Placer Dome Inc	61°58'/94°24'	diamond drilling; geological mapping; geochemical sampling;
N88J944 05/90	Comaplex Minerals	63°39'/94°32'	geological mapping; geochemical sampling; geophysical surveys; prospecting
*N89C097 03/91	Noble Peak Resources (NPR)	62°32'/94°36'	diamond drilling; mapping; geochemical sampling; prospecting
N89H087 09/89	BPH, Utah Mines (primarily fuel cache site)	61°39'/94°46'	airborne geophysical survey which was likely completed prior to 15 May.
*N89C142 06/90	Sikaman Gold Resources	62°22'/93°30'	mapping; surveys; possibly diamond drilling; occasional helicopter support

PERMIT# exp. date	COMPANY	LOCATION	LAND USE ACTIVITY
BEVERLY HERD VICINITY			
N89J109 07/90	Urangesellschaft (UG)	65°17'/98°30'	geological, geochemical and geophysical surveys
BETWEEN PROTECTION AREA (SCHULTZ LAKE AREA)			
N87C744 05/90	UG (Pointer Lk)	64°28'/97°36'	exploration drilling
N88J916 06/90	Geo Survey Cda (EMR)	64°10'/96°43'	bedrock mapping
N88C925 04/90	Pamorex Minerals	64°17'/97°28'	diamond drilling
N88N930 06/90	Geo Survey Cda	64°09'/96°42'	bedrock mapping
N88C933 05/90	Urangesellschaft Kiggavik project	64°28'/97°38'	exploration drilling
N89C143 06/90	Noranda	61°00'/98°00'	geological surveys; prospecting; diamond drilling; possible use of helicopter (for transportation)
89J133 05/91	Wollex	65°13'/96°15'	diamond drilling
N89J137 09/89	PNC Exploration	64°37'/97°20'	drilling operation and field work

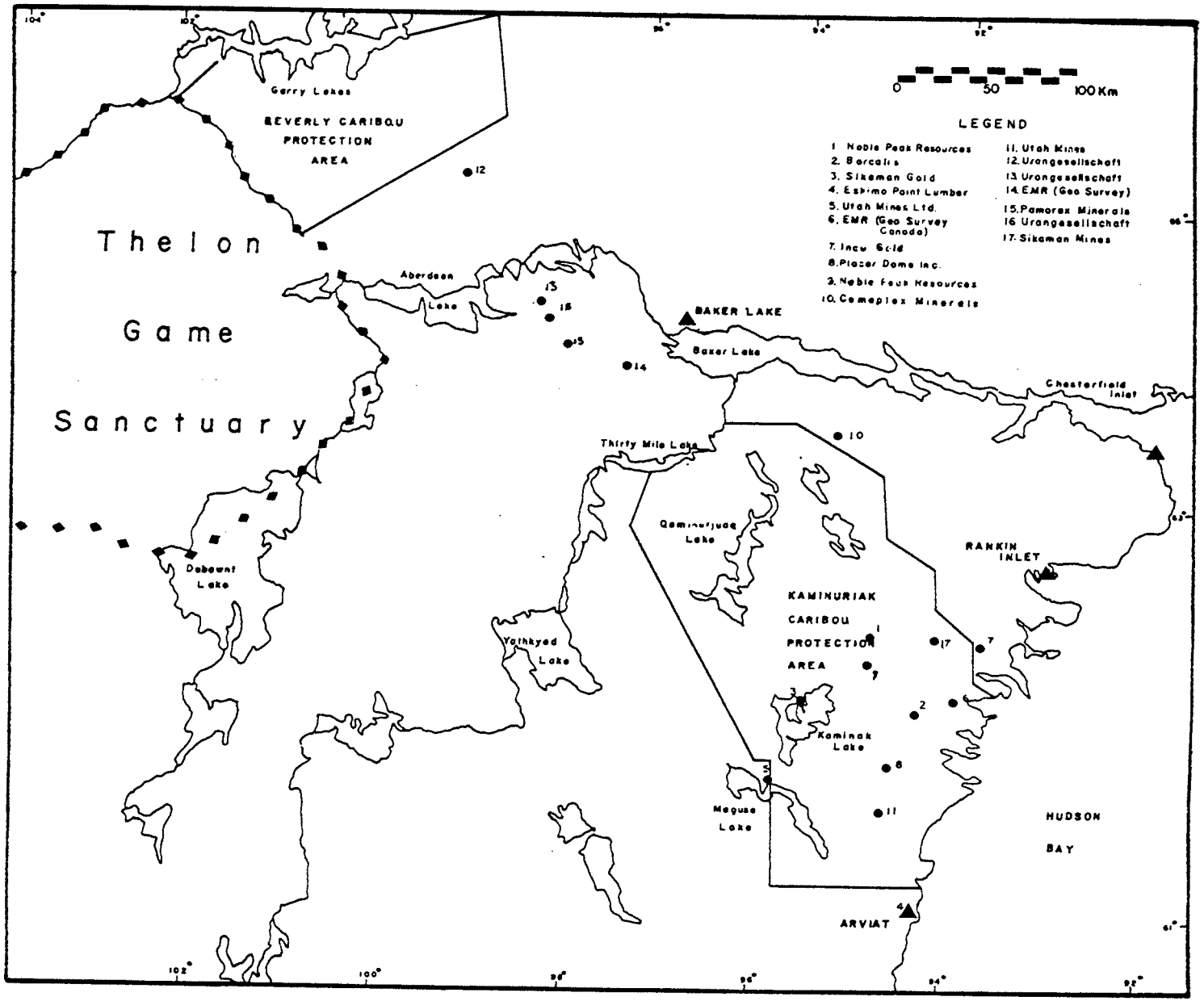

Figure 8. Active Land Use Sites in or near the Caribou Protection Areas, Keewatin Region, 1989.

primary activity at all sites (Table 1).

Kaminuriak Protection Area

Six requests for release from the Caribou Protection Measures were received by INAC from four companies: Noble Peak Resources (NPR), Sikaman Gold Resources, Geological Survey Canada (GSC),and Utah Mines. Operations of Utah Mines and Inco, located outside the Kaminuriak Boundary, were also influenced by the caribou migration.

NPR requested releases for the Quartzite Lake (Permit N89C097) and Happy Lake (Permit N87C666) land use permits on 14 June, both of which were granted. The Happy Lake release was sought in order to allow a cleanup crew short term access to the site. When NPR made new arrangements on 27 June for another cleanup crew to go to the site, they again obtained a release from INAC. Personnel at the NPR Quartzite Lake site vacated the area in early July.

A release request received from Sikaman Gold Resources (Kaminak Lake) on 11 May was granted for 15 May, and remained in place throughout the protection period. Sikaman retained only a few personnel at the camp until July to provide maintenance services and conduct geological survey work. In mid-July Sikaman brought in a full complement of staff to the Kaminak Lake site and requested a release for the Maze Lake site. The request for release was denied because of significant numbers of caribou in the area.

Inco (N88C926), though outside the Protection Area, contacted INAC 25 June to enquire whether or not it would be feasible to enter their camp. Due to the large concentration of caribou in the area, the Caribou Monitor recommended that Inco personnel not be allowed access to the area. Personnel did not enter the work area until the Caribou Monitor recommended, on 4 July, that it would be acceptable.

During a visit to the Utah camp (N88C908) on 8 July, the Caribou Monitor was advised that two days previously, an estimated 1000 caribou had passed by the camp and that the camp manager had confined all personnel to the camp for one day to ensure that no conflict occurred. Utah Mines requested permission to do work which required use of a helicopter, in the Protection Area, north of Maguse Lake. A release was granted on 10 July.

Geological Survey Canada (GSC) was granted a release from the Protection Measures on 14 June for permit N88J916. On 22 June significant numbers of caribou were in the vicinity of the GSC site, but the release was continued since GSC advised INAC that there would only be six crew members conducting work on foot. They also advised that the helicopter had left the area and would not return until 2 July. Because significant numbers of caribou remained in the area on 1 July, INAC attempted to contact GSC to advise that the helicopter should not return until the caribou had left the area. GSC was finally contacted on 4 July, at which time the helicopter pilot informed INAC that he had in fact been working in the area since 30 June. The pilot stated

that he had been assured by the GSC camp manager that helicopter activity had been authorized. The helicopter left the GSC site on 4 July since it was no longer needed at that time, but did return to the area on 10 July to undertake further work, after receiving permission from INAC to do so.

Although there was no official request for a release from Borealis (N87D797), one was provided by INAC, on 28 June, with the understanding that it would remain in effect regardless of caribou activity in the area. This decision reflected the high priority INAC attributed to the clean-up of fuel spills which could ultimately cause more damage to the wildlife and environment. Thousands of caribou were at the Borealis site on the 1 and 8 July. No use was made of the release.

WATER CROSSINGS

Except for the report received from J. Niego, Renewable Resource Officer, regarding a large concentration of caribou crossing the Kazan River in late July, no information regarding crossings was made available to the Caribou Monitor.

RECOMMENDATIONS

Protection Area Boundaries

Although caribou cows are protected regardless of where they travel in the Keewatin Region, the Protection Area boundary should reflect as accurately as possible those area which have been used extensively by cows in recent years, during the protection period. This ensures that organizations intending to work in the Keewatin are aware of likely areas for potential conflict, and affords them the information required to alter projects or consider contingency plans. Companies wishing to work within the Protection Area are, therefore, accepting a greater risk of having their operations curtailed, should a conflict arise. Secondly, unlike those sites outside the Protection Area, companies wishing to work in the Protection Area must first receive permission from INAC. As with any monitoring activity, there must be a defined area which can be dealt with effectively given time and budget constraints.

As such, it is recommended that the boundary be altered to reflect the areas used by caribou cows between 15 May and 15 July, during the past five years. An addition to the eastern border of the Kaminuriak Protection Area, specifically a 500 km^2 area along the Hudson Bay coast, between Pistol Bay and Mistake Bay should be incorporated (Figure 9). An area of similar size can be deleted from the northwest corner of the Protection area (Figure 9).

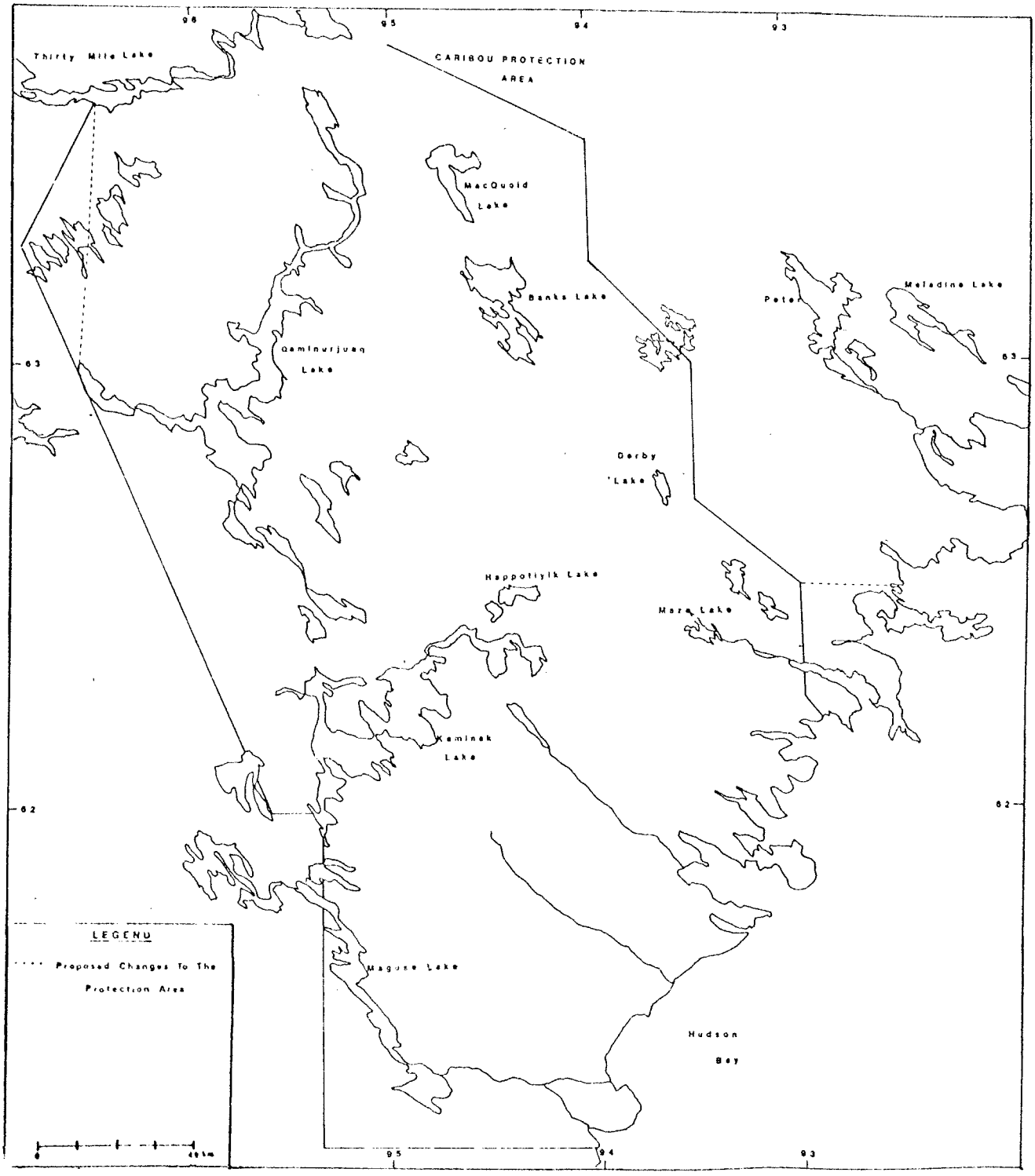

Figure 9. Recommended Changes to the Kaminuriak Herd Caribou Protection Area, NWT

Air Charter Contract

Based on availability of aircraft and the conditions under which the monitoring must be accomplished, the use of a twin engine aircraft equipped with the Omega navigational system was the most appropriate choice in 1989. However, aircraft availability does continually change and it is, therefore, recommended that the Regional Biologist, Keewatin Region, consider alternatives prior to the 1990 season.

It is also recommended that the service contract stipulate that the aircraft be available between 14 May and 15 July. The additional day will enable the monitor to make a reconnaissance flight prior to 15 May should any company request a release to be effective the first day of the Protection Period. The 24 hour lead time would allow the company to be given some indication as to whether there is a likelihood of their having to vacate the site or not.

Communication with Land Use Site Permit Holders

Based on conversations among the Caribou Monitor, land use site personnel, and some pilots, it is apparent that many people are unclear about the regulations regarding land use activity and conflict with caribou (e.g., what is considered a significant number of caribou, restrictions on aircraft use, reporting obligations, and the obligation to vacate the site under conflict conditions). Most organizations receive a copy of

the Caribou Protection Measures, from INAC, at the same time that they receive their Land Use Permit. A letter reminding companies of the Protection Measures and requesting their assistance in reporting all sightings of caribou, would serve to generate better awareness of the Measures. It is recommended that in future, the Caribou Monitor prepare a form letter, to be reviewed by the INAC District Manager, which would then be sent to Land Use Permit holders in May of each year.

A second concern regarding communication is the need for direct access to land use site personnel. Because a land use release is in effect only as long as a non-conflict situation with caribou is maintained, companies must be able to be contacted and made aware of changes to the status of their release as a result of caribou movement, as determined through caribou monitor flights. In 1989 one situation arose where inability to contact personnel at a land use site resulted in unacceptable land use activity taking place. In addition, land use activity is frequently carried out in areas far removed from the immediate vicinity for which the Land Use Permit was issued. Regular contact with personnel at land use sites is required in order to accurately determine where land use activity is taking place so that INAC, and the Caribou Monitor, will know where to direct monitoring efforts.

For the above mentioned reasons, it is recommended that INAC maintain a radio for the purpose of contacting land use sites, and that no release be issued to sites which could not be contacted through this means.

Financing of the Project

Increasing costs, especially those relating to flight time, have resulted in a drastic reduction in the number of available hours of flying time over the past years. In 1989, the Caribou Monitor felt that had additional demands been placed on the project, either by land use site activities in the Beverly caribou herd Protection Area, or by increased land use activity in the Kaminuriak caribou herd Protection Area, it is likely that there could have been less than adequate coverage of the caribou movement during the Protection Period. It is, therefore, recommended that additional funds be made available for the Caribou Monitoring Study in 1990.

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Caribou sightings contributed by Keewatin Air pilots increased significantly the data base with which the Caribou Monitor worked. This, and the pleasant attitude of all staff, was appreciated.

Adult Education, Rankin Inlet, provided the Monitor with computer facilities.

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Appendix A 1989 Caribou Protection Measures

1. Caribou Protection Areas

(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 Permitte 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 activites 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. Caribou Protection General

(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 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 any latitude or less than 300 metres above the ground level, and

(iii) the use of snowmobiles and ATV's (all-terrain vehicles) outside the immediate vicinity of the camp.

3. Caribou Protection Migration

   (a) During migration of Caribou, the Permittee shall not locate any operation 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. Caribou Crossing

   (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 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 Caribou Monitor Flight Report, 1989

Date:
Flight Number:
Aircraft:
Observers:
Pilots:

Cloud Cover:
Visibility:
Temperature:
Wind:
Snow Cover:
Ice Conditions:

Flight Time:

Land Use Rationale:

Observations:

Land Use Activity:

Other Human Activity:

Water Crossings:

Summary:

Appendix C Flight Schedule and Objectives for Caribou Monitoring, Kaminuriak Herd, 1989

DATE	HOURS	OBJECTIVES
14 May	2.2	1) Check the Sikaman Mine site area to determine whether or not a 15 May release is viable 2) Check the area around the Noble Peak Resources (NPR) and Borealis sites for caribou activity 3) Attempt to determine the general route of migrating caribou
22 May	1.6	1) Check for caribou in the Sikaman Mine site area 2) Fly near the NPR site area to gather general information on caribou movement and land use activity 3) Check the Mandreville and Banks lakes areas to determine if caribou are in those areas
30 May	2.1	1) Determine caribou activity around Sikaman Mine, under release 2) Determine if there are still caribou migrating in from the south, and/or whether or not the majority of the herd has passed, and unlikely to affect, Sikaman, NPR, or Borealis land use sites until post-calving
05 June	1.6	1) Check Happotiyik Lake area to determine likelihood of it being within the caribou calving ground, to provide information for Sikaman and NPR sites 2) Check the Banks Lake area to ascertain if caribou are still in that area and to see whether or not calving has begun.
10 June	6.7	1) Determine location and range of the Beverly and Kaminuriak calving grounds 2) Track radio collared caribou to verify observations of location of caribou
14 June	1.8	1) Determine feasibility of granting releases to Geological Survey Canada (GSC) and NPR land use sites, and of continuation of the Sikaman site release 2) Assess the movements of caribou in the southern portion of the calving ground and potential for conflict with land use sites
18 June	2.2	1) Determine whether or not a significant number of caribou have moved into the area around the NPR land use site 2) Observe general distribution and movement of the cows in order to provide feedback to companies and to ascertain area used by the caribou during post-calving

22 June	2.3	1) Check status of caribou around GSC, NPR and the Sikaman land use sites to determine whether releases should be continued or withdrawn 2) Determine feasibility of a release for the Inco land use site 3) Determine location of major concentrations of caribou
25 June	2.1	1) Check for the presence of caribou in the vicinity of Sikaman, NPR, Inco, and GSC land use sites, and the Maze Lake area, in order to make recommendations regarding releases 2) Observe the area north of the land use sites to determine movement and distribution of caribou
28 June	.9	1) Check for presence of caribou in the area around the Inco site to determine whether or not a release can be recommended.
1 July	2.3	1) Check for presence of caribou around the Inco, GSC, Borealis, Sikaman, and NPR land use sites 2) Locate major concentrations of caribou within or near the protection area, using radio tracking equipment to facilitate the search
4 July	1.6	1) Determine whether or not caribou are still in the area around the Inco land use site 2) Try and determine whether or not GSC has a helicopter in the area 3) Fly over the Sikaman and NPR sites to determine presence of caribou, in particular of bulls which may have travelled north
*8 July	N/A	1) Make opportunistic observation of caribou activity 2) Speak with personnel at land use sites 3) Get a better estimate of proportion of cows with calves
10 July of	3.0	1) Determine whether or not significant numbers caribou are around any of the land use sites 2) Check for caribou in the area north of Maguse Lake, where Utah Mines has advised they intend to work
13 July	2.8	1) Determine whether or not caribou are in the vicinity of Inco, GSC, or Borealis in order to provide recommendations regarding continuation of releases 2) Check the vicinity around NPR land use sites in case NPR requests a release to re-enter the area 3) Check the Peter Lake area to locate caribou reported by H. Kablalik (INAC) [1]

[1] INAC allowed the Caribou Monitor to accompany personnel during a helicopter survey of land use sites.