2.0 WILDLIFE

2.1 Caribou

2.1.1 Background

The Qamanirjuaq caribou herd passes through the region of the SRI study area during their annual migration from their winter range below the treeline in northern Manitoba to their calving grounds located south of Baker Lake (Figure 2). The last survey of the herd, conducted in 1994, estimated the herd size to be around 496,000 animals (Beverly and Qamanirjuaq Caribou Management Board 2002). However, the size of the herd has varied over the years. During the 1940's and 50's, herd size was estimated to be greater than 100,000 animals. In 1985 the herd size was greater than 200,000, and by 1994 it approached almost 500,000 animals (Wakelyn 1999).

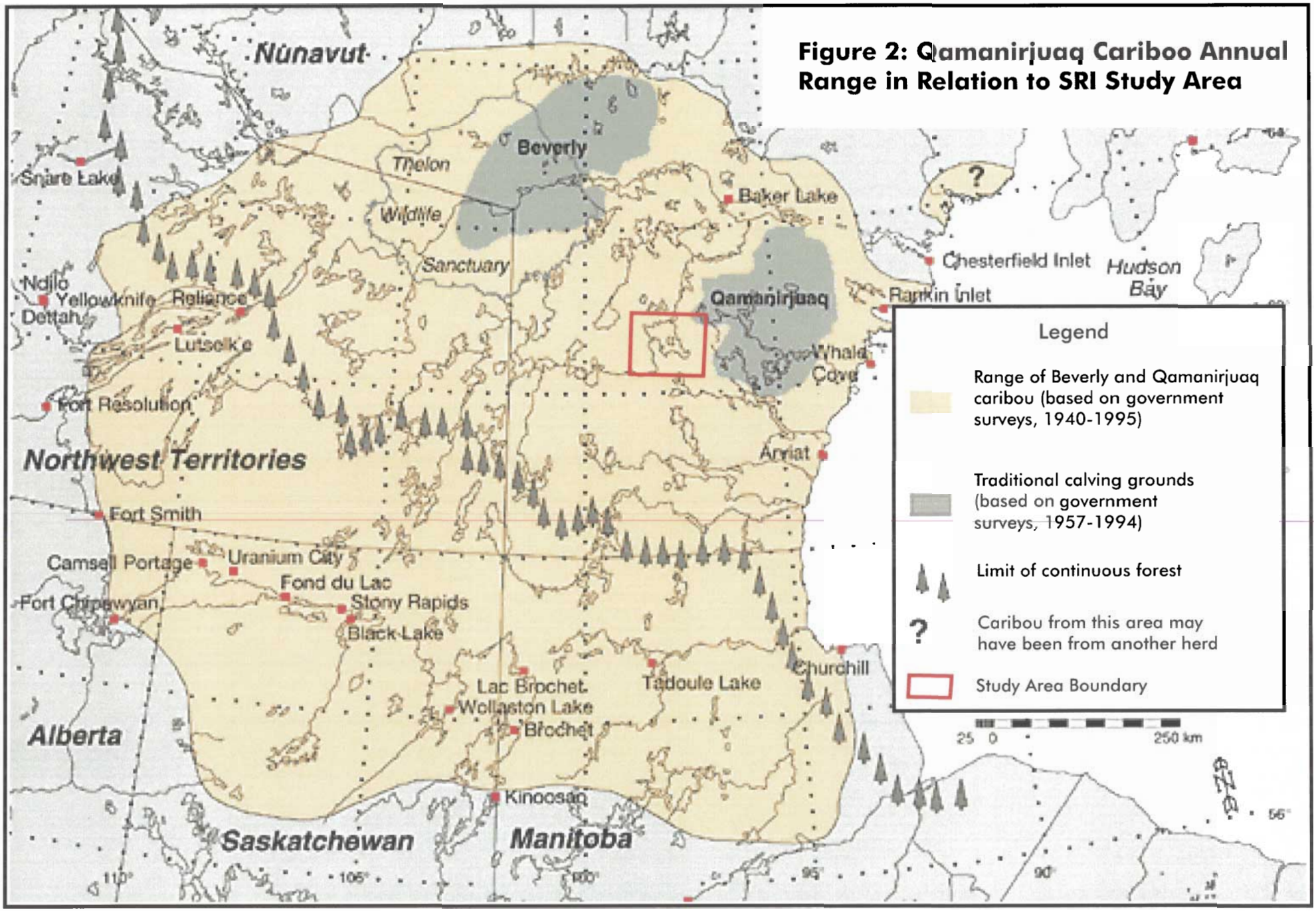
The size of the herd's range is not known with certainty as it overlaps with that of the Beverly herd and differentiation of individuals between the two herds is problematic. However, its boundaries can be approximated as being the western shoreline of Hudson Bay, northward to Wager Bay, southward to Brochet, Manitoba (northern Manitoba) and approximately 350 km inland. The calving grounds are located south of Baker Lake and the wintering range typically extends to below the treeline in northern Manitoba. Caribou distribution and density in the SRI study area varies from year to year.

In general, spring migration northward begins in late March and continues throughout May. However, for the adult bulls, spring migration typically occurs about one month after other caribou in the herd have begun to migrate. Fall migration southward typically occurs between late September through to the end of October.

Calving typically occurs between late May and late June, and the specific timing is influenced by the condition of the cows. Most calves are born between 5 and 15 of June. During post-calving (late June throughout July) the caribou gather in large groups to reduce harassment by mosquitoes (Plate 2).

Once the incidence of insect harassment diminishes in late summer (early August) caribou groups begin to break up. At this time, their movement patterns are not well known. Fall migration is influenced by the weather but typically occurs between mid-September to mid-October. The rut occurs in late October (Beverly and Qamanirjuaq Caribou Management Board 1999).

Figure 2: Qamanirjuaq Caribou Annual Range in Relation to SRI Study Area



Source: Base map from Beverly and Qamanirjuaq Caribou Management Board, 1999.

Plate 2 Early July, Post Calving Period, Caribou are Still in Large Groups

During normal years, caribou typically appear in the SRI study area in low numbers during the annual spring migration (mid-March to late May) and during post-calving (late June and July). The known calving grounds occupy an area between Quartzite Lake, Qamanirjuaq Lake, Ferguson River and Banks Lake, an area to the northeast of the SRI exploration site.

Following post-calving, the herd disperses across the summer rangelands, and spends time grazing in favourable habitat on graminoids and willows (Plate 3). By October the herd begins to migrate southward towards the wintering grounds, eventually working its way south of the treeline. Although most of the herd spends the winter in the boreal forest, some animals remain on the tundra just above the treeline (Beverly and Qamanirjuaq Caribou Management Board 1999).

Plate 3 Small Group of Caribou Moving Through a Riparian Zone (SR)

2.1.2 Studies Completed in 2001

Caribou baseline studies carried out during 2001 included two aerial surveys. These surveys were designed to determine the abundance, density and distribution of caribou across the SRI study area in relation to the location of current exploration activities at Ferguson Lake.

2.1.3 Methods

Nine systematic transects were flown twice during the summer, on 01 July and 17 August, respectively. The distance between each transect was 5 km (Figure 3); thus, the effective survey width for each transect was 1 km, comprising 500 m on each side of the helicopter. This study design provided 23% coverage of the study area.

An A-Star helicopter was used for both surveys. Three personnel flew on each survey: a pilot on the right, a navigator/observer on the left and one additional observer in the rear right seat. The pilot concentrated on maintaining altitude, ground speed and adherence to flight lines and, in addition, helped to spot animals. The navigator/observer monitored the flight path, collected waypoints for each observation, pointed out animals,

and counted those animals on the left side and beneath the helicopter, out of sight of the observer in the rear seat. The right-rear observer recorded all observations on datasheets and counted individual animals on the right side of the aircraft.

Prior to each survey, weather conditions were documented and the helicopter windows were calibrated to the proper transect strip width. Flight altitude and ground speed averaged 90 m (agl) and 150 kph, respectively.

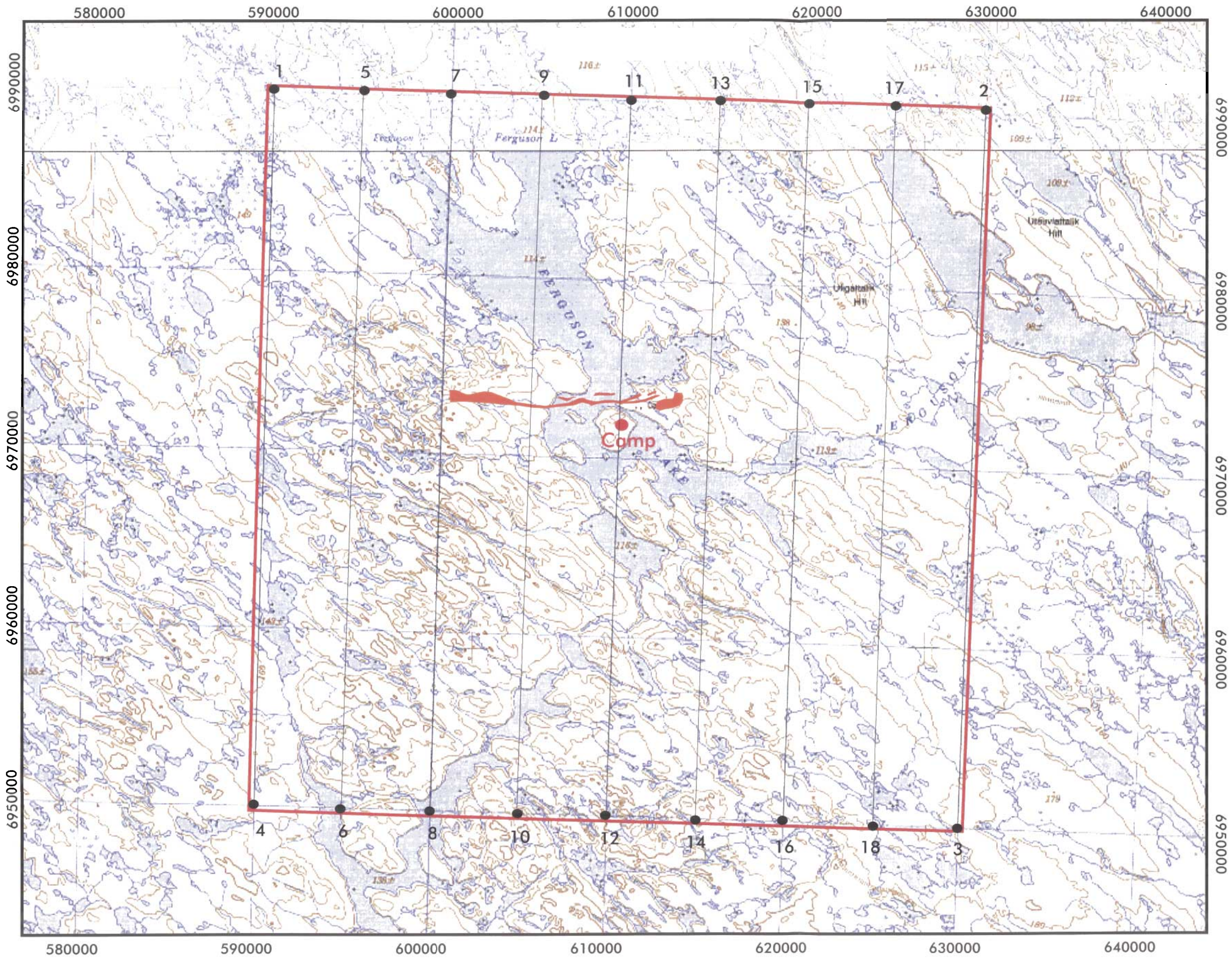
All observations of wildlife were recorded. For caribou, all individuals seen within the effective survey strip were recorded as "In" while those beyond the transect boundary were recorded as "Out." Density estimates were calculated using Jolly's Method 2 (Jolly 1969).

Observations included an estimate of herd size, direction of movement (one of eight cardinal directions), activity; and when possible habitat type, habitat modifier, and group composition.

The following information was recorded for each observation:

- transect number
- GPS waypoint, using a hand held Magellan 12XL Global Position System (GPS), with a remote antenna for increased accuracy
- species
- number of caribou "in" and "out"
- dominant composition of caribou group
- dominant activity
- overall directional movement of caribou, if moving
- habitat type
- habitat modifier
- additional observations of any wildlife and den locations.

Figure 3: Aerial Survey Flight Paths



0 km 10 km

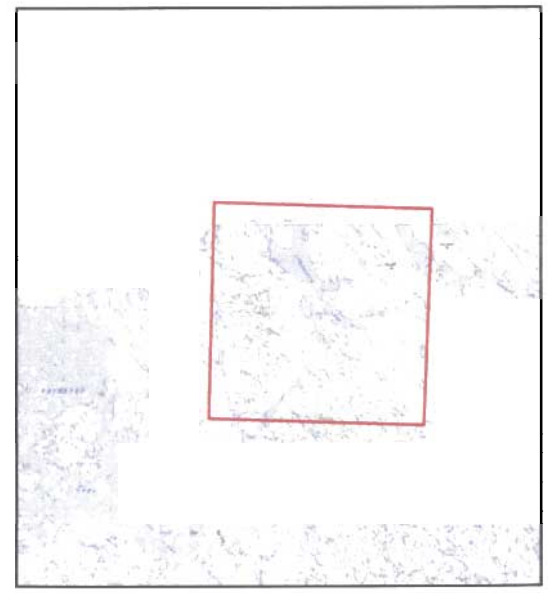
Scale - 1 : 227,500

Date: April, 2002
Projection: UTM, Zone 14
Company: EBA Engineering Consultants Ltd.
Project #: 01-14863

Legend

- Interpreted UTEM Conductors (Project Exploration Area)
- Caribou Transects
- Camp Location
- Study Area Boundary

Inset Map



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Incidental observations of carnivores (bears, wolves and wolverines) muskoxen, raptors, Sandhill cranes, and other noteworthy observations were documented such as nesting and denning sites. Incidental observations collected during aerial caribou surveys are listed in Appendix A. All terrestrial species documented during the 2001 field program are list in Appendix B.

2.1.4 Results

Aerial Surveys

A total of 6.5 hours were flown on two systematic surveys across the study area on 01 July and 17 August. A total of 8,536 and 24 caribou were counted on transect during the July and August aerial surveys, respectively.

The estimated abundance of caribou within the study area for each survey date was 37,950 (± 21,600) on 01 July and 107 (± 18) on 17 August. The July estimate of 37,950 individuals contains a large standard error of 21,600. This is attributed to counting one particularly large aggregation of 9,800 caribou. This one group of caribou was counted from aerial photographs taken during the survey. Most observations consisted of small groups that were widely dispersed across the study area. The caribou documented across the study area during the July survey represent the post-calving period; while the few caribou documented during the August survey represent the late summer period when caribou groups disperse following the insect harassment season.

Other wildlife observations documented during aerial surveys, in order of dominance, included 329 Canada Geese, 167 Greater White-Fronted Geese, 84 muskoxen, 48 Sandhill Cranes, 29 Herring Gulls, 11 Tundra Swans, 5 wolves, 1 Long-tailed Jaeger, 1 Rough-legged Hawk, 1 Golden Eagle, and 1 Willow Ptarmigan (Appendix A).

2.2. Muskoxen

2.2.1 Background

Muskoxen are commonly seen throughout the region of the study area. The majority of the muskoxen in the world are found in Nunavut and the Northwest Territories (Graves and Hall 1988). These animals occur on most arctic islands, along the coast and in some areas as far south as the treeline. Historic numbers and distribution were greatly reduced across the barrenlands during the last century through a probable combination of over-hunting and unfavourable weather conditions (Graf 1989). Over the last few

decades the population in the central mainland of Nunavut and the Northwest Territories has been steadily growing (Graves and Hall 1988), and more recently, muskoxen have been expanding their distribution further south.

2.2.2 Studies Completed in 2001

Muskoxen were surveyed concurrently with the aerial caribou surveys and, consequently, the same survey methodology was employed (See Section 2.1.3).

2.2.3 Results

A total of 6.5 hours were flown on systematic surveys across the SRI study area on 01 July and 17 August. Thirty-nine (39) and 5 muskoxen were counted on transect during the July and August aerial surveys, respectively. The estimated abundance of muskoxen within the study area for each survey date was 173 (± 65) on 01 July and 22 (± 6) on 17 August (Plate 4).

Plate 4 Small Group of Muskoxen Feeding in a Sedge Meadow (CE)

2.3 Carnivores

2.3.1 Background

The primary carnivore species that frequent the SRI study area include grizzly bear (*Ursus arctos*), wolf (*Canis lupus*), and wolverine (*Gulo gulo*). Although there are differences in their biology and population resilience levels, grizzly bear, wolf, and wolverine have some common characteristics that make them vulnerable to human-associated disturbance.

Grizzly bears and wolverines are typically wilderness species, with low population density and low fecundity, resulting in poor ability to respond to negative population pressures (Weaver *et al.* 1996). Even more resilient species such as wolves can suffer population reductions in the face of extensive habitat loss and alienation. Large carnivores are the first to disappear with fragmentation and loss of habitats due to settlement and industrial activity (Weaver *et al.* 1996).

However, despite these recognized sensitivities to development, no specific field studies were conducted on carnivores during 2001. The reasons for this were two-fold. First, carnivores in the SRI study area occur at lower densities than in many other areas above the treeline in Nunavut and the Northwest Territories, making it difficult to acquire enough data for meaningful analysis. Second, carnivore studies are very costly, considering the limited amount of data a researcher can reasonably expect to obtain over such a short field program. Consequently, information on carnivores was obtained primarily on an opportunistic basis, *i.e.* through the recording of incidental observations. No carnivore-specific surveys were flown. However, some eskers were flown in search of dens when opportunities arose, such as when flying back to camp following the completion of each of the two aerial caribou surveys.

Arctic fox (*Alopex lagopus*) and red fox (*Vulpes vulpes*) were not identified as VECs but their presence was recorded. Foxes are plastic in their behaviour and are very tolerant of human disturbance, as evident from the active dens commonly established adjacent to other northern exploration and/or sites.

2.3.2 Results

Very few observations of carnivores and carnivore sign were observed during the 2001 field program. No grizzly bear sightings were recorded. However, grizzly bear sign was observed in a few areas of the SRI study area, and one set out side the study area. (Figure 4).

The first observation (waypoint 99) consisted of an attempted bear den in the northeastern portion of the study area (Plate 5). Three other sets of observations were recorded around Ferguson Lake that consisted of relatively fresh bear diggings. These excavations are a result of grizzly bears digging for arctic ground squirrels (Plate 6).

Plate 5 Freshly Dug Grizzly Bear Den Located 15 km East of Ferguson Lake

Plate 6 Grizzly Bear Sign, Digging for Arctic Ground Squirrels

Wolves were only observed on two occasions during the field program, once during the aerial caribou survey in July and once during the habitat work. During the July caribou survey, five (5) wolves were seen along the western edge of the SRI study area (Figure 4). However, once the caribou passed through the study area, the wolves also appeared to leave the area. Another wolf was documented leaving what appeared to be an active den site (Plate 7) (Figure 4).

Although no wolf pups were documented at this location it is suspected to be an active den based on the number of entrance holes, fresh tracks, observation on one adult leaving the site, fresh bone fragments and scat.

No wolverines or wolverine sign were observed during the 2001 field program, but are expected to occur in the area in low densities. One family of foxes was spotted by a drill rig crew and was reported to the wildlife crew.

Plate 7 Wolf Den 28 km South of Ferguson Lake

2.4 Birds

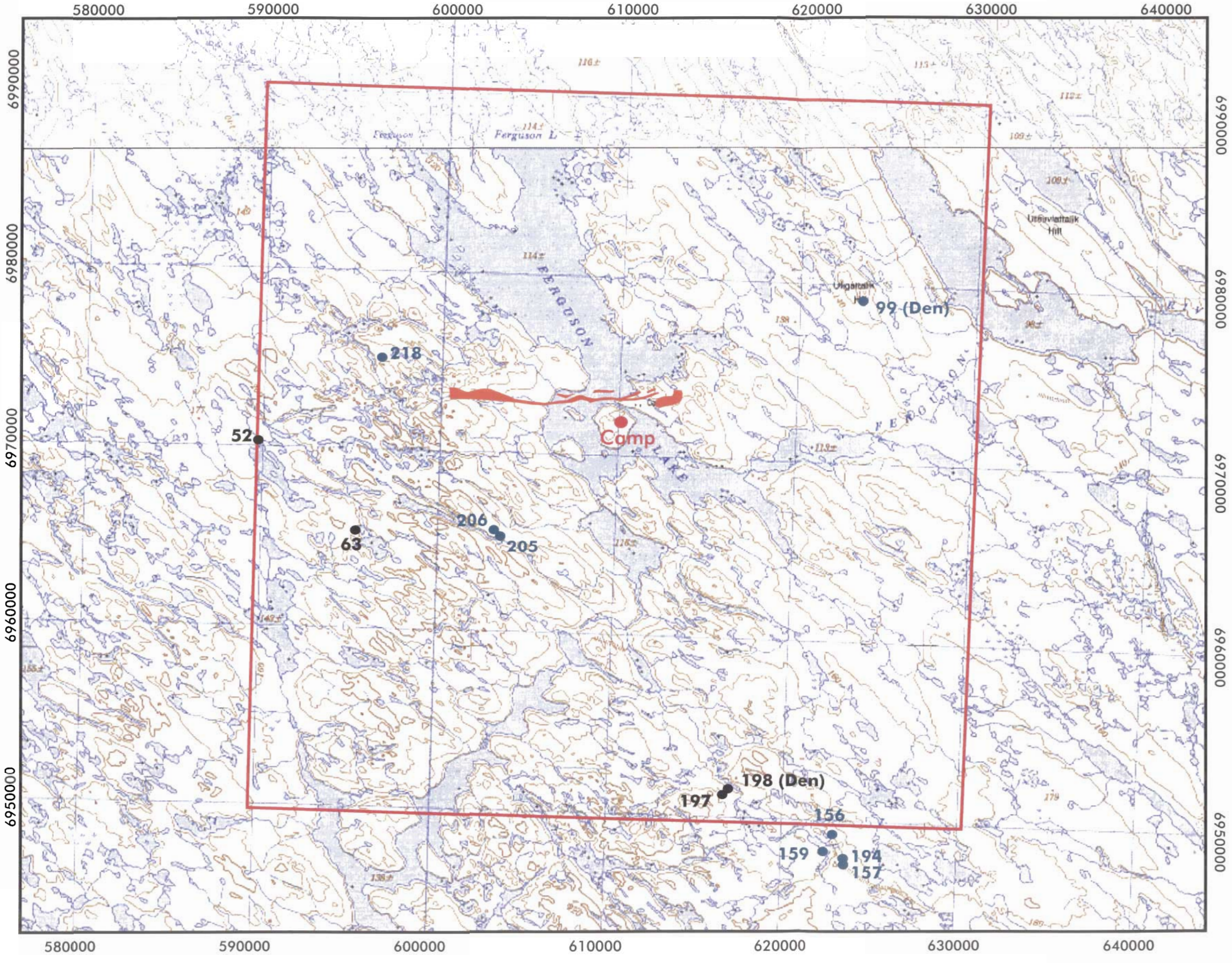
2.4.1 Background

Nunavut and the Northwest Territories are home to few year-round resident birds but host immense numbers of migratory species during the brief snow-free period. The importance of the arctic regions for nesting and brood-rearing is evident in the 16 migratory bird sanctuaries that have been established across Nunavut and the Northwest Territories, covering 11 million hectares of arctic coastal habitat (Graves and Hall 1988).

Most of these sanctuaries are for the protection of waterfowl. One-fifth of the North American population of all ducks, geese and swans nest in the Northwest Territories and Nunavut (Graves and Hall 1988).

Although many migratory species use arctic habitats for only a few months of the year, these areas are important because birds depend on them for breeding and nesting. SRI's project area is small compared to the length and breadth of the bird migratory pathways. Birds in the SRI study area and the region are considered to be VECs because of their relatively high species diversity in each habitat type and their general sensitivity to development.

Figure 4: Carnivore Observations Documented During 2001



0 km 10 km

Scale - 1 : 227,500

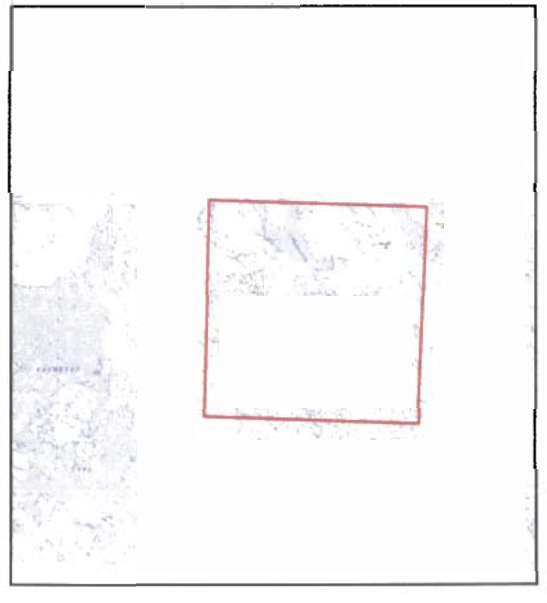
Date: April, 2002
Projection: UTM, Zone 14
Company: EBA Engineering Consultants Ltd.
Project #: 01-14863

Legend

- Grizzly Bear Observation
- Wolf Observation
- Interpreted UTEM Conductors (Project Exploration Area)
- Camp Location
- Study Area Boundary

Note: Observation label denotes waypoint number.

Inset Map



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Some species, in particular waterfowl and ptarmigan, are also very important to the Aboriginal and other residents of the surrounding region for food. The presence of bird species has been used as an ecological indicator to monitor environmental health.

The rationale for most monitoring activities is a recognition of the potential for change. The contribution of monitoring programs is to provide confirmation of their value in the form of early warning signals from the effects of human impacts. Monitoring of birds can be a valuable tool for determining the state of the environment, or changes in the environment (Baillie 1991). Birds are often used in monitoring programs since they are usually high in the food chain and, consequently, are particularly susceptible to environmental changes. Species feeding on fish, such as loons and colonial waterbirds, and birds of prey are at the top of their food chains. A shift in prey abundance as a result of human -caused disturbance can affect bird populations at the local level.

Breeding bird surveys were originally planned for early June but because the permitting process had not been completed in time, these surveys could not be conducted. However, in lieu of these breeding bird surveys, birds present in the area were documented during the vegetation/habitat assessment component of the program. A total of 32 different species of birds were documented as occurring in the wildlife study area during the 2001 field program (Appendix B).

A raptor survey was conducted in July. Raptors and Sandhill Cranes were also documented during the caribou surveys, conducted in July and August. Waterfowl were documented on an opportunistic basis.

2.4.2 Raptors

2.4.2.1 Background

Raptors are commonly used as indicators of environmental quality. Occupying a top trophic level, they are indicative of general ecological integrity; impacts on raptor populations can be reflected throughout the ecosystem (Kennedy 1980). They are also known to be sensitive to disturbance, particularly during breeding. Declines in raptor populations have been attributed to human activities and developments (*e.g.*, Craighead and Mindell 1981).

The *tundrius* subspecies of the peregrine falcon (the subspecies occurring in the Ferguson Lake area) is listed as "species of special concern" by the

Committee on the Status of Endangered Wildlife in Canada (COSEWIC 2000). Peregrine populations in the Canadian arctic (*tundrius* subspecies) have increased in recent years in response to the decline in the use of organochlorine pesticides in their wintering areas (Shank *et al.* 1993).

The gyrfalcon is a high-profile species and the official bird of the Northwest Territories. The gyrfalcon is also of interest as one of the few possible year-round resident bird species in the study area (Platt 1976; Kuyt 1980; Poole and Bromley 1988*a*). Both peregrines and gyrfalcons are listed by CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) under Appendix I, indicating that globally they are threatened with extinction that may be influenced by trade.

Raptors in Nunavut/Northwest Territories have been the subject of monitoring programs conducted by the GNWT and others (Shank and Poole 1994; Shank, 1997) over several decades, and the perpetuation of monitoring contributes to the value of such long-term studies. Because raptors tend to exhibit fidelity to nesting sites (Newton 1979), they lend themselves to monitoring. Long-term monitoring can be used to observe and measure the effects of changes to the landscape as a result of human induced or natural causes.

Ravens are passerines, but have been called "functional raptors" (Poole and Bromley 1988*b*) and are included in this section. Ravens commonly nest on cliffs, which may preclude falcons from using those sites. Conversely, raven stick nests may be used by gyrfalcons (Poole and Bromley 1988*a*). One raptor survey was conducted across the SRI study area during 2001. The specific objectives of the survey were to locate and assess the status of raptor territories and nesting sites within the SRI study area.

2.4.2.2 Methods

The raptor survey route used for the SRI program focused on areas with potentially favourable nesting sites, as noted during systematic aerial caribou surveys, and known locations of previously occupied territories, as reported by the SRI field crew.

The survey was conducted from an A-Star helicopter and involved a slow fly-by of known, suspected, or potential nest sites. The survey crew consisted of a pilot, a front-seat navigator/observer, and a rear-seat observer/recorder. The helicopter flew past potential sites at a distance of 25 m, and a prominent cliff face was inspected for active nests. In most cases, this permitted a thorough evaluation of the site with a single pass, and the helicopter was able to depart the scene in under a minute. Site locations were marked on 1:50,000 topographic maps and GPS coordinates were recorded.

The status of raptor territories was determined according to the following criteria:

- NS Nest not seen; no birds seen
- OT Occupied territory but no nest seen. One or more adults present
- UU Unoccupied and unproductive. Nest seen but was not productive. No adults present
- OU Occupied nest but known to be unproductive
- OP Occupied nest; productivity likely but uncertain
- OC Occupied nest during courtship with no eggs yet
- OE Occupied with eggs
- OY Occupied with young.

Nest productivity was evaluated on the basis of a single site visit. As a result, reported productivity may not reflect the final status of each site. In some cases, nests that appeared non-productive may have produced young later (although this is unlikely given the late date of the survey), and more likely, some nests, which appeared productive, may have sustained mortality that was undetected.

2.4.2.3 Results

Twenty-six sites were located and investigated in the study area. Eight raptor territories were established and at least seven of these involved occupied nests.

Peregrine Falcons occupied five territories in the study area and one just outside the study area boundaries (Figure 5). Two of the six sites were confirmed as occupied with eggs (OE); while the remaining four sites were occupied nests with reproduction likely (OP). Confirmation of successful fledging requires multiple visits and ground searching. To minimize stress to birds, ground searches were avoided. The results suggest that at least six pairs of Peregrine Falcons were successful in reproducing eggs and/or offspring during 2001, based on the observed presence of eggs and territorial behaviour (Plate 8).

Plate 8 This Peregrine Falcon Scrape (Nest) was Believed to Have Been Used During the Previous Year

Rough-legged Hawk territories were observed at two sites. One of these included a nest with two young that appeared close to fledging (Figure 5). The second site contained a pair exhibiting territorial behaviour, but no nest was found.

Habitat Use

Consistent with most studies of habitat use by raptors, cliffs are the main feature of raptor habitat in the SRI study area (Plate 9). Peregrines and Rough-legged Hawks hunt in a variety of habitat types according to those frequented by their prey, but they have stringent requirements for nesting sites. Typically, nesting sites are established in the most rugged terrain available in the area. All active raptor nest sites documented in the study area were located on cliffs. Often, lakes are associated with the base of the cliffs. Most sites are well protected against access by humans or wildlife predators.

Plate 9 Much of the Quality Raptor Habitat is Located in the Southwest Corner of the Wildlife Study Area

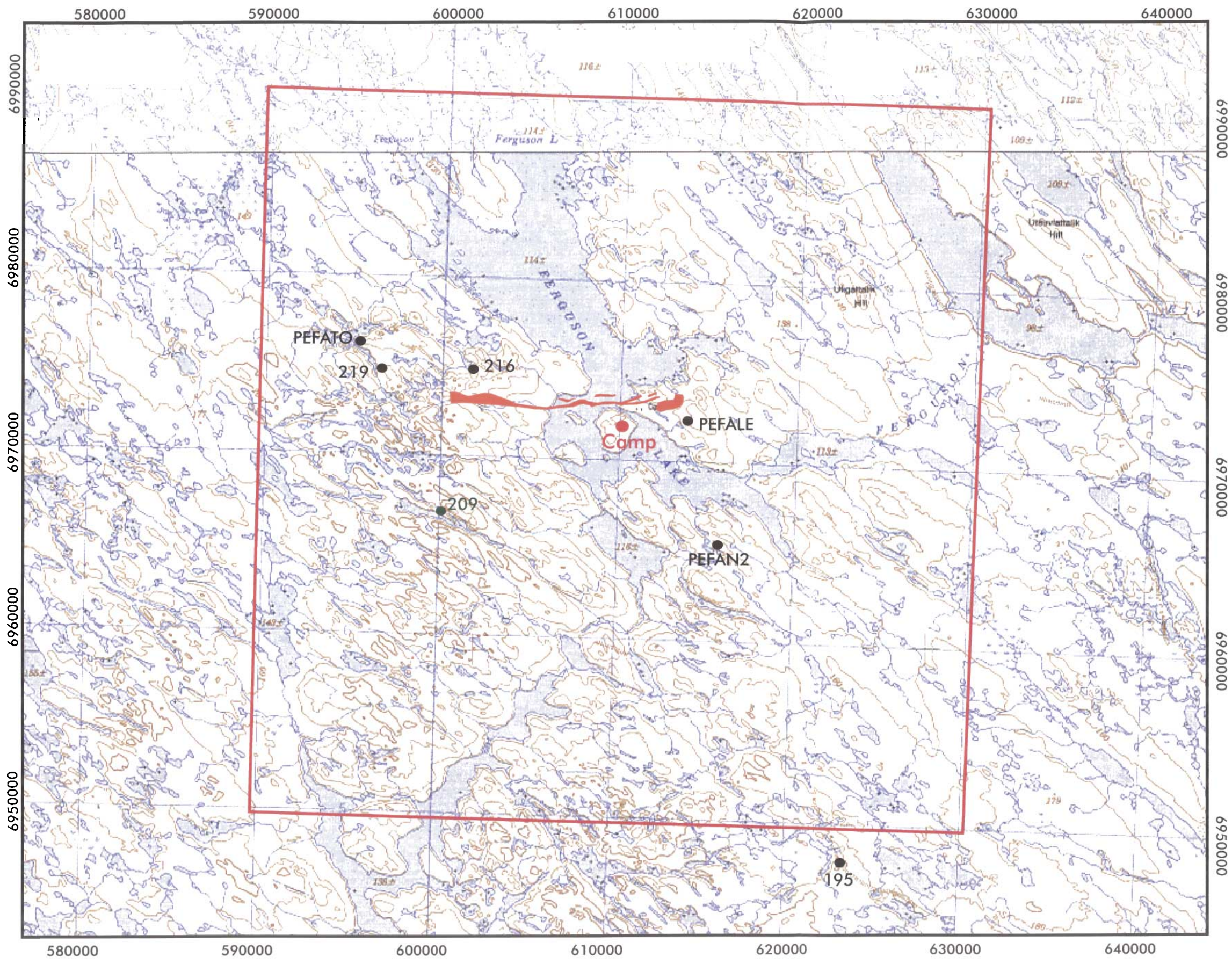
2.4.3 Sandhill Cranes

2.4.3.1 Background

Sandhill Cranes were not a selected VEC for this project. However, they are commonly distributed throughout the wildlife study area, and were highly visible during aerial caribou surveys. Consequently, they were included in the 2001 wildlife study program.

Sandhill Cranes are large birds and are highly conspicuous when standing on the low-open tundra. They nest on higher ground adjacent to wetland communities.

Figure 5: Raptor Nests Surveyed, 2001



0 km 10 km

Scale - 1 : 227,500

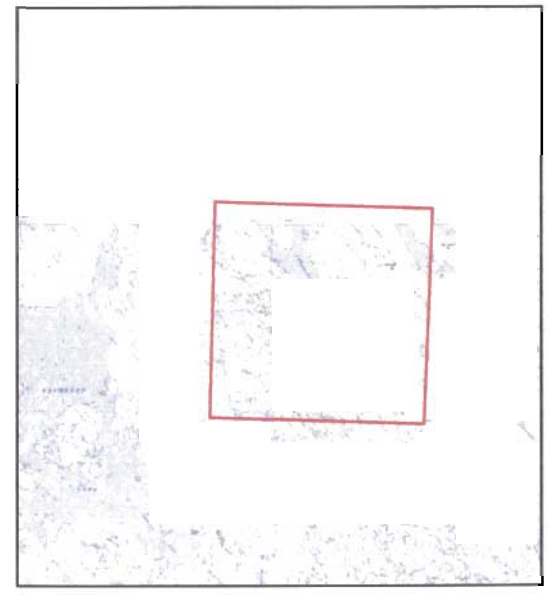
Date: April, 2002
Projection: UTM, Zone 14
Company: EBA Engineering Consultants Ltd.
Project #: 01-14863

Legend

- Peregrine Falcon
- Rough-legged hawk
- Interpreted UTEM Conductors (Project Exploration Area)
- Camp Location
- Study Area Boundary

Note: Observation label denotes waypoint ID

Inset Map



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2.4.3.2 Methods

Sandhill Cranes were documented during aerial caribou surveys. The methodology used for these surveys is discussed in Section 2.1.3. This technique is suitable for large crane-like birds nesting on open tundra.

2.4.3.3. Results

Sandhill Crane territories were documented during the two caribou surveys completed on 01 July and 17 August. A total of 58 cranes were recorded, consisting of single and paired observations. Paired observations were interpreted as being a territorial pair and, hence, a suspected breeding pair. Paired birds were much more visible during August than in July. During the August survey, 18 of 20 observations consisted of pairs, while in early July only 6 of 16 observations consisted of pairs (Plate 10).

Plate 10 This Pair of Sandhill Cranes (Center) Fledged One Young on the Same Island Where the SRI Camp is Situated

Presumably the lower pair counts in early July were a result of one of the parents in a given pair being more difficult to detect because of sitting and incubating activities. In contrast, during August, the young birds would have fledged, resulting in both parents standing and being more visible. The data obtained support this statement, as there was almost exactly twice the number of individuals counted in August compared to early July during the incubation period.

The results documented in August are presumed to be more reflective of the true number of territories than those recorded in July and, consequently, are the data set used to estimate the number of territories in the SRI study area. Consequently, there were 18 pairs (territories) of Sandhill Cranes documented across the study area during 2001.