Appendix 6

- **Notes on Wildlife in the Vicinity of the Echo Bay Mines Ulu Project and Associated Transportation Corridor, Hubert and Associates and Canamera Geological Ltd., August 1996.**

NOTES ON WILDLIFE IN THE VICINITY OF THE ECHO BAY MINES ULU PROJECT AND ASSOCIATED TRANSPORTATION CORRIDOR

A draft report for facilities planning purposes

Prepared for: Ulu Project
Echo Bay Mines Ltd.

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Canamera Geological Ltd. of Vancouver

August, 1996

INTRODUCTION

The information reported here is the result of aerial surveys for significant site specific wildlife sign and presence around the minesite and in the area of proposed winter road routes between the Ulu gold deposit and Lupin Mine in the NWT. It is prepared in advance of the overall environmental evaluation so that site specific information can be used for planning the winter road alignment that will be described in the land use application to be submitted in the fall of 1996.

FIELD STUDIES

All observations reported here were made from helicopter. The routes followed are shown on the 1:250,000 wildlife series topographic mapsheet (76L) attached. It shows the proposed routes surveyed and the locations of carnivore dens and raptor nest sites observed.

Surveys were conducted by flying along the route and searching for dens and examining raptor nest terrain which is characterised by sharp cliff faces that may or may not have an overhang. The Kitikmeot Inuit Association had indicated to Echo Bay Mines (Rod Cooper, Ulu Project project manager, Echo Bay Mines, personal communications) that the terrain two kilometres either side of the centre line should be included in survey areas. This was exceeded for all winter road routes as well as around the Ulu mine and camp sites under construction at the time.

Locations of all site specific wildlife observations were recorded with the locations taken from the helicopter's GPS navigation system.

12 July, 1996

The initial reconnaissance of the proposed routes was made on the evening of 12 July on a survey originating at the Canamera Carat Lake camp. The survey flight followed the extensive esker system to the northwest of Carat Lake and then north northeast to the Ulu Camp 3 location. The return flight followed the easterly most route to approximately 66 28 N and then followed the middle route south to Kathawachaga Lake and back to Contwoyto Lake from which we returned to the Carat Lake camp.

July 28 and 29, 1996

A more rigorous survey was flown over the esker system northwest of the Carat Lake camp 28 and 29 July. On the 28 the outside flanks of the esker were scrutinized, while on the 29 the interior portions of the esker system were examined.

Also, on 29 July the esker system north of Kathawachaga Lake was surveyed en route to the Ulu Project Camp 3.

July 30, 1996

The terrain in the vicinity of the road, airstrip and Ulu mine site all north of the Hood River were examined. This included areas north to 67 00 N, west to 111 05 and east to 110 52.

July 31

All remaining winter road routes south of the Hood River were surveyed July 31.

WILDLIFE OBSERVATIONS

Carnivore Dens

Bears, wolves and foxes use dens for shelter during the winter months. Dens are also used for the early stages of rearing young to the stage where they can travel overland. In the case of grizzly bears, the cubs leave the den area shortly after the female emerges in the spring, usually late May. Both foxes and wolves use the den as a nursery well into the summer.

Bear dens are simple and usually shallow excavations in a sandy bank or slope (see Map 1). They are dug in the fall and used for one winter. They usually collapse in the following summer. Wolf and fox dens are more elaborate and usually consist of a series of burrows that are used in successive years. Because of such repeated use, wolf and fox dens are characterised by lush vegetation dominated by grasses responding to the added nitrogen and calcium in the soil around den sites from faeces and bones.

Canid (fox/wolf) den sites are scattered throughout the esker systems and were examined during these surveys, both northwest of the Carat camp as well as along the Kathawachaga Lake esker system. Although fresh bear tracks and/or scat were observed in both esker systems, dens were found only on the eskers northwest of the Carat camp. Their locations are shown on the map attached to these notes.

Birds of Prey

These predators of the bird world are collectively known as raptors. The area of our surveys supports several species - the golden eagle, the rough-legged hawk, the peregrine falcon and the gyrfalcon. Bald eagles were also observed during the surveys but the tundra is marginal to their breeding range and no nest was observed. As sites occupied by ravens are also used by raptors, these were also recorded.

As a group, raptors are seasonally migratory but with significant individual variation. All species set up breeding territories while the land is snowcovered and so are active on the tundra while winter roads are in operation. It is for this reason that it is important that raptor nest sites are documented and alignments adjusted accordingly where this is possible. This is important despite the tolerance that

breeding pairs of some of these species have shown for human activities at other locations in their global distribution. Significant points of the reproductive cycle of each species are discussed below.

Bald eagle (*Haliaeetus leucocephalus)*

On July 12 a single bald eagle was seen in the vicinity of 66 06 N X 111 30 W. On July 29 two bald eagles were seen in the same general area. A search for a nest was made without locating one. The tundra is marginal to the ordinary range of the bald eagle. Nests are made of sticks and twigs and are used in successive years which makes for a huge structure after repeated usage. These nests are usually built near the top of a tall tree or occasionally on a cliff (Godfrey, 1966); neither were evident in the area where these bald eagles were observed.

Golden eagle (*Aquila chrysaetos)*

The golden eagle ranges over much of the northern hemisphere including most of North America. It may use the same territory and nest site in successive years. Nests are built of sticks and usually located on a cliff ledge (Godfrey, 1966). Birds may stay on their territories most of the year in southern latitudes. In the north they arrive on the territory in April (Chris Shank, personal communications) with egg laying occurring in late May (Bromley and Shank, 1987). Incubation takes 43 days (Godfrey, 1966) with the nestling period lasting another 77 days before young birds are fledged in early September.

Single golden eagles were observed during surveys on July 29 in the vicinity of 66 04 30 N X 111 27 11 E and on 31 July at 66 44 09 N X 111 17 02 E. Searches throughout both areas failed to locate active golden eagle nest sites. The presence of non active stick nests in the area however suggests that it may be suitable for golden eagles which nest regularly near the central Arctic coast (Poole and Bromley, 1988).

Rough-legged hawk (*Buteo lagopus)*

Rough-legged hawks have a circumpolar breeding range and overwinter in the open country of north temperate latitudes (Godfrey. 1966). Rough-legged hawks prey mainly on microtine rodents (Poole and Bromley, 1988) and so their abundance and breeding success in the region may coincide with the lemming and vole population cycles there (Bromley and Shank, 1987; Poole and Boag, 1988). They build stick nests on cliffs and may maintain several nest sites within their breeding territory which can be used in successive years (Bromley and Shank, 1987). Nineteen unoccupied stick nests in 10 different locations were observed on the surveys in the region (see attached maps for locations).

These hawks arrive on their northern breeding territories in early to mid-May and initiate egg laying in early June (Poole and Bromley, 1988). The incubation period lasts about 31 days (Godfrey, 1966) and the young birds take to the wing about 41 days after hatching (Bromley and Shank, 1987).

Peregrine (*Falco peregrinus)*

The peregrine enjoys a cosmopolitan distribution. In Canada peregrine populations are separated as to sub species. The birds in the region of the Ulu Project are of the *tundrius* sub species' population. The *tundrius* peregrine is not an endangered species in Canada. Peregrines will occupy the inactive nests of other raptor species or establish a nest on a ledge or pinnacle without any construction or other visible preparation of any sort (Godfrey, 1966). The arrival of peregrines on the breeding territory is variable but the mean date in a central Arctic study was mid May and egg laying usually occurred in early June (Poole and Bromley, 1988). Incubation takes 32 to 34 days and the nestling period lasts 35 to 40 days.

Six active peregrine nests were located during the surveys. Please see the map for locations in relation to the infrastructure associated with the Ulu Project.

Gyrfalcon *(Falco rusticolis)*

The gyrfalcon is another circumpolar species, but unlike the peregrine, it is not migratory in that it spends the winter in northern latitudes (Godfrey, 1966). The nest, like the peregrine may be a stick nest built previously by other raptors or ravens, or a scrape on a ledge. Egg laying initiation is variable and may begin between late April through to the third week of May. In a study of 38 sites in the central Arctic between 1983 to 1986, the mean period for egg laying was early May. Incubation takes 34 - 35 days and the young birds fly 46 to 49 days after hatching.

One active gyrfalcon nest was observed during surveys in the area.

Raven (*Corvus corax)*

Ravens are not technically considered to be raptors but their nest habitat is similar to that of the raptors in the region so sites found to be occupied by ravens are generally considered to be part of the overall nest site inventory available to the raptor populations of a given region. Like the hawks and eagles, raven nests are stick structures and over successive years can grow to considerable size.

Ravens are not migratory and so are present in the vicinity of their breeding territory throughout the winter. Egg laying dates vary but the mean date documented by Poole and Bromley (1988) on monitoring 12 nests in the central Arctic was mid-May. Incubation lasts 20 - 21 days and the young birds are usually flying by mid July.

One active raven nest was observed during the surveys and two groups - presumable family units of recently fledged birds were observed that were not associated with any obvious nest location.

RAPTOR NEST SITES IN RELATION TO ULU PROJECT INFRASTRUCTURE

The nest site data presented consist of the data collected during the surveys described above plus selected sites located in the Lytton Minerals Jericho Project study area.

Terrain hosting raptor nests is characterised by inaccessible ledges on cliff faces, often with the added protection of an overhang. In any given year suitable sites may be occupied by any of the northern birds of prey plus ravens. It is for this reason that all sites in a given area are documented. An area may often have more than one nest site and so may host multiple active and overlapping territories of different species in close proximity. Also, a vacant nest does not mean a vacant territory.

The attached maps show the nest sites and bear dens located during the surveys in July, 1996. They are shown in relation to the proposed transportation infrastructure planned for the Ulu Project. The southern half of the road network is still under review. Fortunately the western route does not pass near any nest locations. It does however pass near an esker system that hosts bear denning habitat. Further surveys will be done in this area to examine this esker system at the time of bear denning activity to further assess this issue.

The eastern route of the southern portion of the road passes near a nest site that was occupied by ravens in July 1996.

Site specific details

Site specific notes on all nest sites will be enumerated in two sets: those that are located north of Contwoyto Lake, and those that are located in the area of the Lytton Minerals Jericho Project. The locations shown on each map are discussed below in a south to north sequence.

U1. 66 28 28 N X 110 40 36 - near eastern option of Lupin / Ulu winter road
- occupied by ravens in 1996; three young visible on July 29
- a ledge with a strong overhang and a northern exposure facing the esker in a small gorge over the rapids
- the river flows along the flank of an esker that may be used for granular materials
- the nest site may be within 2 km of the road alignment between lakes along this esker
- topographic features are such that a minimum distance of the nest site might be achieved and so mitigate potential impacts of disturbance.

U2. 66 31 06 N X 111 22 16 W - near the 1996/97 construction supply road where it turns north
- occupied by peregrines in 1996; one fully feathered chick visible on July 31
- a south facing site with a strong overhang
- routing the supply road on the south side of the watercourse to avoid rapids and spring overflow may reduce disturbance at this site.

U3. 66 33 24 N X 110 50 02 W - near main haul road
- occupied by peregrines in 1996; 4 chicks in white down visible on July 31
- ledge with SE exposure in a short ravine running to the SW
- two vacant stick nests nearby
- a family of ravens at ravine mouth.

U4. 66 35 06 N X 111 20 48 W - near 1996/97 winter supply route
- occupied by peregrines in 1996; 2 chicks visible on July 31
- ledge with a SE exposure
- distance from the nest site might be achieved by taking route as far west as topography and practicality will permit.

U5. 66 37 28 N X 111 22 50 W - near 1996/97 winter supply route
- occupied by peregrines in 1996; 4 chicks in down visible on July 31
- ledge over small lake with a NE exposure
- following a route south of water course will achieve greatest distance from nest site.

U6. 66 40 09 N X 11 27 25 W - approximately 2 km from 1996/97 winter supply route on Hood River
- unoccupied stick nest in 1996; a single rough-legged hawk observed in vicinity on July 31
- a SE exposure
- a distance of 2 km can be achieved if route follows SE bank of Hood River.

U7a. 66 42 13 N X 110 51 49 W - near 1995/56 winter supply route
- occupied by gyrfalcon in 1996; one adult and one fully feathered young observed at nest July 31
- ledge with strong overhang and SW exposure
- does not seem to be within critical distance of present alignment of project haul road.

b. 66 42 14 N X 110 51 56 W - near 1995/56 winter supply route
- unoccupied stick nest with a SW exposure
- does not seem to be within critical distance of present alignment of project haul road.

c. 66 42 16 N X 110 52 17 W - near 1995/96 winter supply route
- unoccupied by peregrines in 1996; 4 chicks in down observed July 31
- exposed pinnacle overlooking ravine
- does not seem to be within critical distance of present alignment of project haul road.

U8. 66 47 42 N X 110 59 35 W - near project haul road at Hood River crossing
- occupied by peregrines in 1996; birds active in area but young appear to have fledged by 30 July, very prominent whitewash on cliff below nest
- ledge with some sticks above rapids on Hood River with strong overhang
- northerly exposure with intervening high ground between nest and proposed haul road route

- two stick nests in immediate vicinity, one upstream and one downstream.

U9. 66 48 48 N X 111 14 20 W - 2+ km west of 1996/97 winter supply route
- unoccupied stick nest on ledge with a northerly exposure.

U10. 66 52 10 N X 111 04 32 W - 2+km west of airstrip
- occupied by rough-legged hawks in 1996; 3 chicks observed July 30
- ledge with a NE exposure

U11. 66 52 33 N X 110 59 02 W - in gorge SE of old BHP camp
- two unoccupied stick nests
- SE exposure in gorges SE of old BHP camp
- not within critical distance of Ulu Project infrastructure.

U12. 66 55 07 N X 110 59 41 W - west of inflow to East Lake
- unoccupied stick nest in 1996
- single peregrine in immediate vicinity of nest on 30 July
- on ledge with northerly exposure
- seems to be within 2 km of Ulu Project camp facilities.

U13. 66 57 00 N X 110 50 02 W - 2+km north of mine and camp sites
- unoccupied stick nest
- single peregrine in immediate vicinity of nest on 30 July
- on ledge with NE exposure
- not within the critical distance of Ulu Project infrastructure.

The road proposed for the 1996/97 and perhaps 1997/98 winter construction periods passes near four peregrine nests that were active in July 1996. All four nest sites appear to be within 2 km of the proposed winter construction supply route that will be used by slow moving track and large low pressure tire vehicles. Since this route will be used only for two seasons, at the most, the impact if any, of late season winter road use on the peregrine population should not be significant. Nevertheless, the risk of impact should be kept to a minimum. Mitigation measures include reducing the number of traffic passes. This might be accomplished by concentrating all traffic in convoy and so reduce the number of potentially disruptive incidents. Also, if breeding pairs are active in these territories, their response to the traffic should be monitored; this is especially relevant in the case of the nest site on the Hood River (U8) directly south of the current Ulu camp (Camp 3) as this site is situated near the haul road proposed for the operational period of the Ulu Project.

It is noteworthy that two nests at U7 were occupied in 1996. This is significant in that this site seems to be within 1 km of the route used as a winter supply route to set up Camp 3 and bring in heavy equipment and materials for construction at the minesite. The last load by Delta Commander (large low pressure tires) over this route was hauled in on April 20. The gyrfalcon at U7 was most certainly on the breeding territory on that date as it is believed that gyrfalcons are in their territories most of the winter; also late April falls within the range of dates for egg laying initiation reported by Poole and

Bromley (1988) for the central Arctic. Assuming that the fully feathered young bird observed in the nest was within a week of fledging, counting backwards from an assumed fledging date of August 6, puts its egg laying date at (nestling period is 45 - 50 days [Poole, 1989] plus 29 days for incubation) around May 20.

Two sites are located within 2 km of the project haul road. One site (U8 - discussed above) has high ground between it and the project haul road alignment and risk of impact is low. The other site- U3 - is in a ravine that may shield it from most of the disturbance. It also may be possible to move the alignment to the east to gain greater separation from this site.

Only one nest site - U1 - is located within the critical distance of the southern portion of the winter road system whose final alignment remains under review. This site was occupied by ravens in 1996. It faces north and an large rock outcrop lies between the nest site and the terrain suitable for a road route to the south which probably reduces the risk of impact from winter road traffic.

Map 2 shows the approximate route location under consideration through the Lytton Minerals Jericho Project area and down onto Contwoyto Lake. Of the many raptor nest sites in the Jericho wildlife study area, only those within 2 km of the route are shown. This route was used as a winter road by the Jericho Project in 1996. The last load to pass over this route was in late May. Site specific details of each of the 6 sites within 2 km of the route follow in a south to north sequence.

J10. 65 59 30 N X 111 28 28 W - approximately 2.5 km from Jericho portal and within 2 km of winter road route
- unoccupied in July 1996
- 3 stick nests on ledges with NW exposure.

J 7. 65 59 46 N X 111 24 26 - overlooking the approach from Contwoyto Lake
- unoccupied in July 1996
- 5 stick nests in two clusters of two and three nests each; three sites on cliff above the shore and two on the next terrace inland.

J8. 65 59 48 N X 111 25 37 W - within 1 km of route through gorge down to Contwoyto Lake
- unoccupied in July 1996
- stick nest with northerly exposure on cliff ledge above route.

J9. 69 59 54 N X 111 26 45 W - within 1 km of route through gorge down to Contwoyto Lake
- occupied by rough-legged hawks in 1996; 3 chicks in grey down observed July 27
- southerly exposure with slight overhang
- two other unoccupied stick nests on cliff west of active nest.

J19. 66 02 00 N x 111 30 26 E - approximately 2 km west of route north of Jericho airstrip
- occupied by rough-legged hawks in 1996; 3 chicks in grey down observed on ledge below nest.

MITIGATING IMPACT ON RAPTORS DURING COURTING, BREEDING AND NESTING

There are no specific regulations in the NWT regarding human activities in the vicinity of raptor nest sites. This was discussed with officials in GNWT Department of Renewable Resources (the agency with statutory responsibility for birds of prey in the NWT) who indicated that the 2 km distance is a good rule of thumb to assess which sites are at risk. Within that distance however are site specific and bird specific variations that affect individual birds' responses to disturbance. A cliff exposure facing away from the direction of the sources of disturbance reduces the risk as does an intervening height of land. There is however significant variability in the tolerance thresholds between birds of the same species. A copy of "Guidelines for mitigating harassment of nesting raptors" prepared by Chris Shank, a raptor specialist with GNWT Renewable Resources appears in Appendix I.

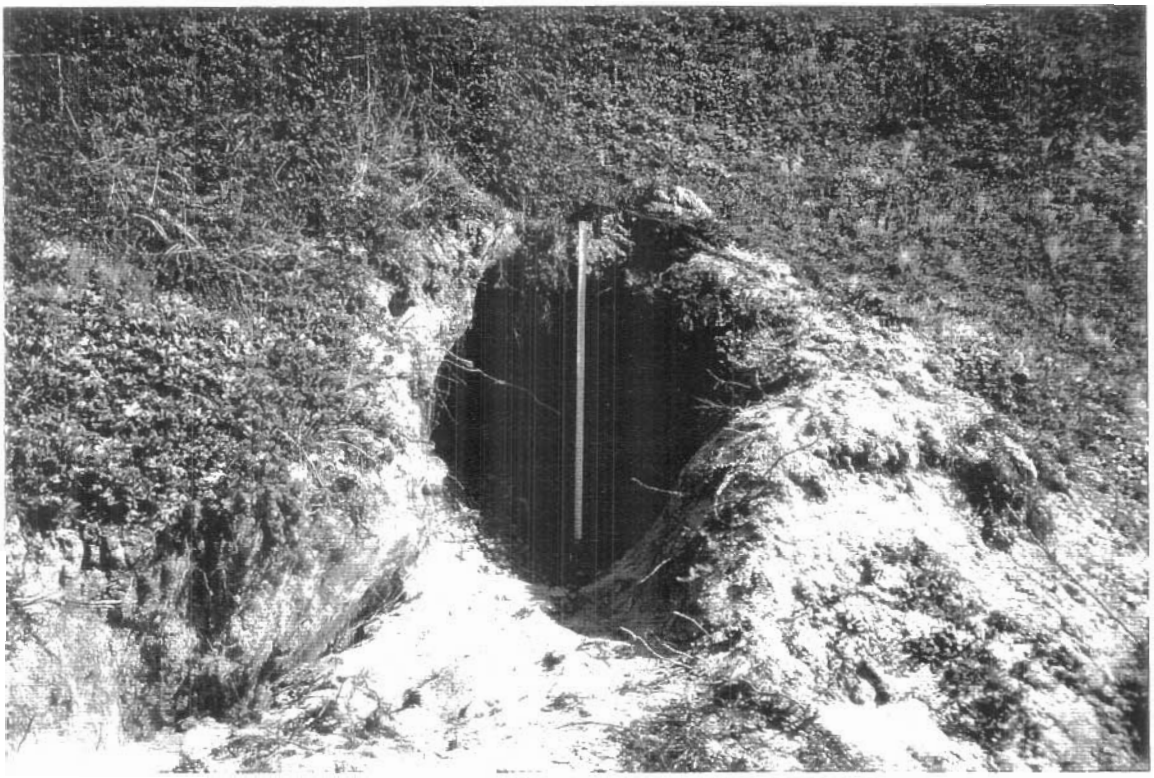


Figure 1. Bear den in esker NW of Jericho Lake.

1:250,000

CANADA

45′ 30′ 15′ 111°00′ 45′ 30′ 15

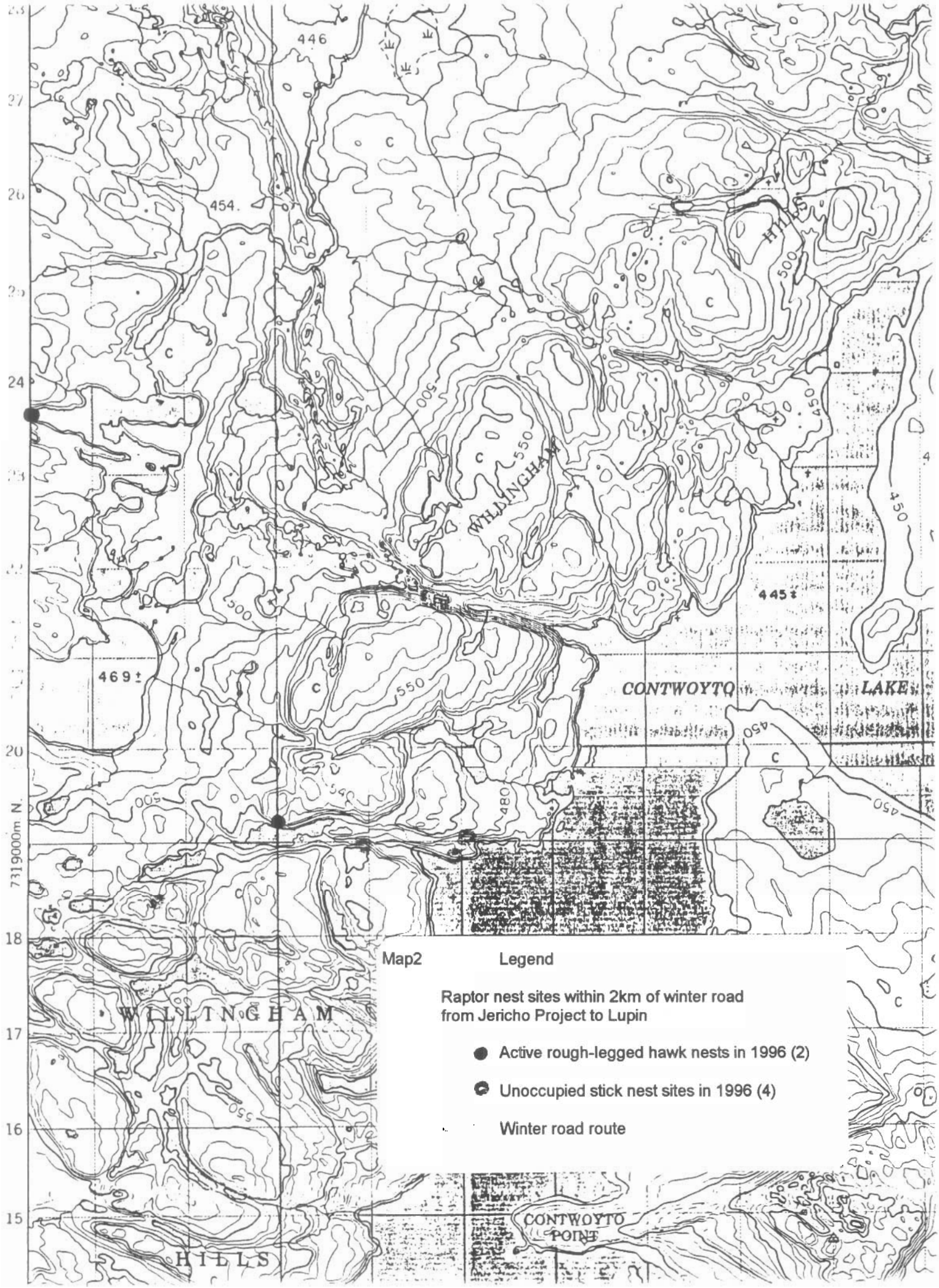
Map 1 Legend

Transportation

- routes under consideration
- construction haul road for 1996
- resupply and ore haulage route during Ulu operations

Wildlife observations

- Peregrine nests (6)
- gyr nest (1)
- raven nest (1)
- rough-legged hawk nest (1)
- vacant stick nest (7)
- bear dens (4)
- P single peregrine observed (2)
- R raven family observed (2)
- B bald eagle observed (1)
- G golden eagle observed (2)
- H rough-legged hawk observed (1)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Map2
Legend
Raptor nest sites within 2km of winter road from Jericho Project to Lupin
Active rough-legged hawk nests in 1996 (2)
Unoccupied stick nest sites in 1996 (4)
Winter road route

Appendix I

Guidelines for Mitigating Harassment of Nesting Raptors

GUIDELINES FOR MITIGATING HARASSMENT OF NESTING RAPTORS

PRINCIPLE #1-- Disturbance is most harmful early in the nesting period.

Commentary

Raptors act to maximize their chances of raising the greatest number of young possible. If they "decide" early in the breeding period that their nest is insecure, they might abandon it. Sometimes they will re-nest at another site but such "re-nests" usually fledge fewer young than first nests. If nests are disturbed late in nesting, insufficient time remains for a re-nesting attempt and the parents accordingly have little to lose by sticking to their original nest site. Risk of nest abandonment therefore declines through the nesting period.

Management Implications

When there is pressure to have restricted access for as short a time period as possible, restrictions should cover the courtship and incubation periods. Tourist viewing and photography of nests should be restricted to the mid- and late-nestling periods.

PRINCIPLE #2--Individuals show variability in their response to disturbance.

Commentary

A predominant finding of most harassment studies is that there is considerable variability in the response to disturbance between individuals and areas. These differences apparently result from differing genetic propensities of individuals, unique life experiences, and specific conditions such as vulnerability, body condition and so on.

Management Implications

To protect individuals and populations at the sensitive end of the disturbance spectrum, management practices must err on the conservative side. It therefore follows that most raptors should be over-protected. This must be accepted and justified to the public. Managers and

biologists should not be embarrassed by those instances of raptors nesting happily on bombing ranges. At the more discrete level, tourist operations should avoid particularly sensitive pairs and steer tourists toward pairs that are robust to disturbance.

PRINCIPLE #3-- Nest failures in several subsequent years can lead to territory abandonment.

Commentary

Experience shows that failure of a nest or breeding territory in several consecutive years often leads to abandonment of the breeding territory and loss of the breeding pair to the population. This is particularly evident at marginal nest sites; ones providing minimal protection. Nest failure and loss of an single year's breeding effort is regrettable but rarely of major significance to long-term population trend. However, loss of breeding pairs in low-density species like raptors can quickly lead to population decline.

Management Implications

Much stricter controls must be placed on persistent, resident disturbances than on those occurring during a single season. Tourist operations should not exist at a nest site in years immediately subsequent to a nest failure.

PRINCIPLE #4-- Approach by animals, including humans, are among the most severe disturbances to nesting raptors.

Commentary

Raptors generally nest in cliffs or tree-tops as a means of providing their young protection from ground predators. This strategy is effective but costly with nest site availability acting to limit populations in many areas. Predation has exercised strong selective pressure on the reproductive strategy of raptors. This would appear to explain why raptors react so severely to approach from the ground by free-moving animals.

Management Implications

Protective measures should emphasize mitigating the proximity of free-moving

people and perhaps place less emphasis on other disturbance sources such as vehicles and noises. Campsites should not be near nests whereas roads could be. Raptors must be provided protection from tourists and photographers as a matter of priority.

PRINCIPLE #4-- Startling nesting raptors leads to worse consequences than a deliberate, gradual disturbance.

Commentary

When startled, an incubating raptor leaps instantly from the nest. The sharp talons can puncture the eggs or slash the young. A gradually intensifying disturbance alerts the incubating bird gradually allowing a gentler and safer exit from the nest.

Management Implications

Tourists and photographers should be educated not to attempt to sneak up on raptor nests. Use of blinds or hides in close proximity to nests should be discouraged. Low level flights by supersonic aircraft can be expected to have far greater impacts on nesting raptors than have been documented in studies of disturbance by propeller and rotor-winged aircraft.

PRINCIPLE #5-- Entering the nest near the time of fledging often leads to premature nest departure.

Commentary

During the last week or so as nestlings, severe disturbance at the nest often causes young raptors to jump out of the nest. This can cause death from the from exposure, predation, starvation or from the fall itself.

Management Implications

Any activity entailing entry or close approach to the nest should be avoided late in the nestling stage. The most serious infringement of this principle is by bird-banders.

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88.11.07.

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