WOLF MANAGEMENT ANNUAL REPORT - 1987

Wolf Population Research and Management Studies in the Yukon Territory
Population Inventories - 1985-87

Part 1. Wolf Inventory, Wolf Lake Area, February - March 1985
Part 2. Wolf Inventory, Nisling River Area, March 1986
Part 3. Wolf Inventory, Nisutlin River Area, February 1987

Approved: _____
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D. Denison of Coyote Air Service, Teslin, flew safely and efficiently on all inventory flights making numerous wildlife observations. R. Farnell, D. Larsen, and D.H. Mossop edited earlier drafts of this report. Thom Rogers designed and drafted the figures and drew the cover illustration.

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INTRODUCTION

The Wolf Lake area in the south-central Yukon was the subject of few wildlife studies prior to 1985. Geist et al (1974) assessed the area as a potential ecological reserve, but made no systematic wildlife surveys in the area. They suggested that a woodland caribou (Rangifer tarandus caribou) herd of an estimated 500 animals occupied winter range near Wolf Lake, and speculated that the general area was important for moose (Alces alces), a small population of Fannin sheep (Ovis dalli), and a wolf (Canis lupus) population of unknown size.

The deductive study design of the Finlayson caribou-wolf population management program (Farnell and McDonald 1986, 1987) tests the hypothesis that wolf predation, in combination with excessive hunter harvest, was limiting population growth of the Finlayson caribou herd. Initially, the study design was temporal; comparing wolf and caribou population trends before, during and following a 5 year, >80% wolf reduction.

Hayes and Farnell (1986) proposed a spatial comparison using a similar wolf-caribou system that would act as an experimental control to the Finlayson Caribou Management Area (FCMA). The Wolf Lake Study Area (WLSA) (Figure 1) was considered a suitable area for investigation as a 'control' study for the following reasons:

1. Both study areas are in the same region of the Yukon Territory.
2. Physiography and climate are similar in both areas (see Oswald and Senyk 1977).
3. Moose and woodland caribou are the most important ungulate species in both areas.
4. Based on the low trapper and hunter harvest of wolves in recent years, the wolf population in the Wolf Lake area is naturally-regulated, similar to the condition of the Finlayson population prior to the initiation of the reduction program in 1983.

Prior to this report, wolf data in the area were sketchy. Geist et al (1974) thought two packs, totalling 25 wolves, ranged in the Wolf Lake - Northern Cassiar Mountains. They speculated that wolves were largely dependent on caribou. In 1976, Hoefs (unpubl. data) observed packs of 17 and 7 wolves on or near Wolf Lake, among wintering caribou.

PART 1.

WOLF INVENTORY, WOLF LAKE AREA

FEBRUARY-MARCH 1985

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December 1987

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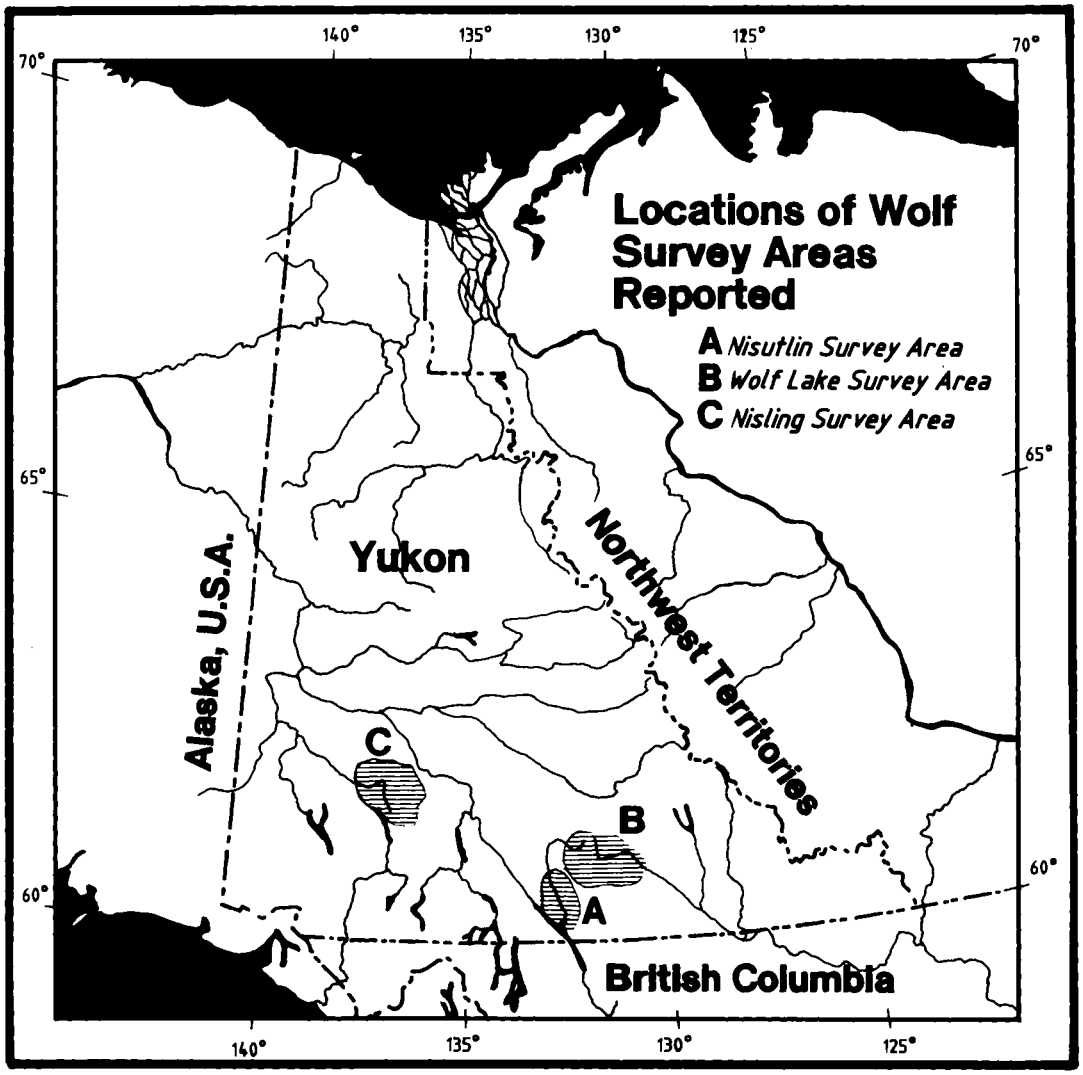
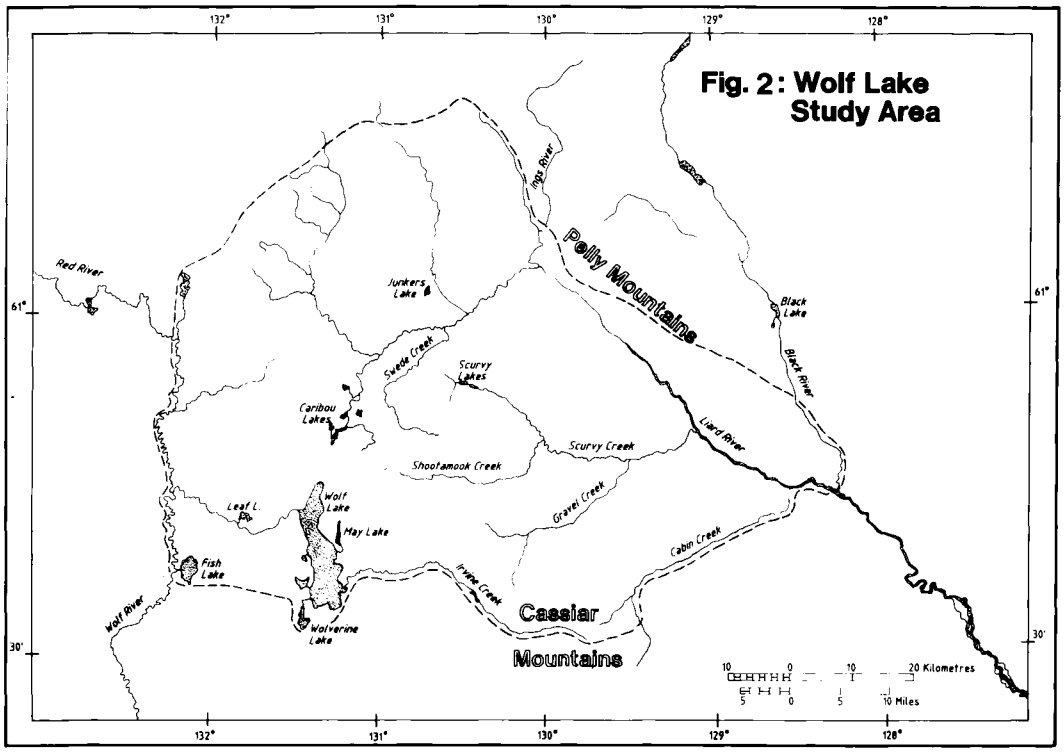

140°
135°
130°
125°
70°
65°
60°
Locations of Wolf Survey Areas Reported
A Nisutlin Survey Area
B Wolf Lake Survey Area
C Nisling Survey Area
Yukon
Alaska, U.S.A.
Northwest Territories
British Columbia
A
B
C



in the Pelly Mountains were the northern border; the lower Black River was the eastern boundary; and the Red River the western border. Most of the western portion of the study area was within the Nisutlin plateau; a broad, rolling terrain characterized by light spruce (Picea sp.) forest interspersed with extensive subalpine meadows. To the east and north, elevations increase above 1500 m a.s.l. with the highest peaks in the Pelly Mountains (Oswald and Senyk 1977). Precipitation is lowest in the southern portion of the study area (375-500 mm), increasing to 625 mm or more at higher elevations to the north and south (Oswald and Senyk 1977).

UNGULATE POPULATIONS AND DISTRIBUTION

Historical information from late 1800's (McDonald and Farnell 1984) suggested a substantial herd of woodland caribou annually wintered in the Wolf and Caribou Lakes area on the Nisutlin Plateau. More recently, Klassen (unpubl. data), Geist et al (1974), and Hoefs (unpubl. data) observed winter caribou distributions near Wolf Lake during the 1970's. Geist et al (1974) subjectively estimated the Wolf Lake herd at less than 500 caribou. A comprehensive herd distribution and demography study was initiated in the fall of 1984 (McDonald and Farnell 1984). In March 1987, Farnell and McDonald (in prep.) censused the Wolf Lake herd, using a

ratio estimator technique (Gasaway et al 1981), modified for woodland caribou. Herd size was 664 (20% variance at 90% C.I.) animals. Calves comprised 9% of the herd in the fall of 1985 and 12.4% in 1986 (Farnell and McDonald, in prep.). From a sample of radio-instrumented caribou, an annual adult mortality rate of 9.4% was calculated (Farnell and McDonald in prep.). From these data, Farnell and McDonald (in prep.) predicted the herd was at a stable, low density.

Little was known of the population status and seasonal distribution of moose in the area. Geist et al (1974) observed moose mainly in subalpine zones in early winter. In March 1976, Hoefs (unpubl. data) observed moose concentrating in the sheltered riparian habitat along major valley floors.

Only scattered bands of Fannin sheep were documented in the northern Cassiar Mountains and southern ranges of the Pelly Mountains (Lortie et al. 1978).

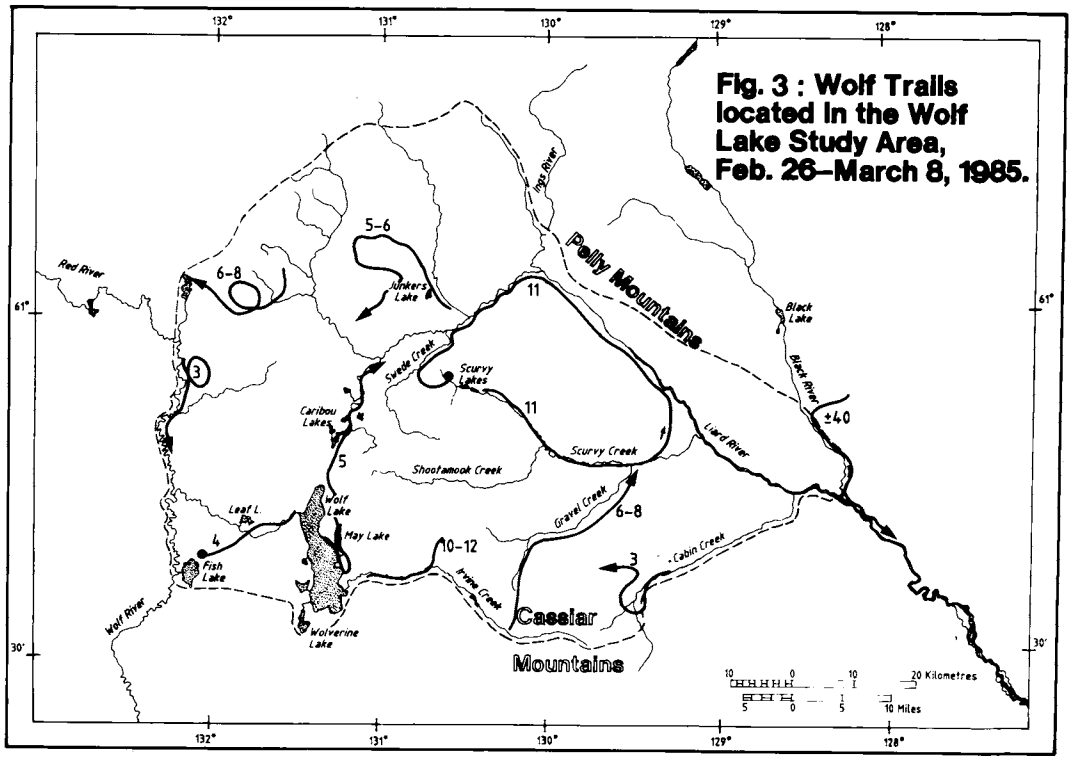
METHODS

Aerial surveys were conducted from a Maule LR 7 fixed wing aircraft during 25-28 February and 4-8 March. Excluding ferry time, 24 hours were flown. Survey coverage rate was about 250 sq km/hour. Two observers were present during all flights. Wolf trails were followed until wolves were encountered or the trails were obscured by ungulate tracks or forest cover. No significant snowfall occured during the survey periods, making it difficult to determine the age of tracks.

During the first few survey flights, high elevation areas were completely searched. Wolf sign, however, was absent at higher elevations, presumably due to the deep snow and absence of ungulates there. Alpine areas were flown over on many occassions and we are confident that these areas did not support wolves. If trails were followed and wolves not subsequently located, the minimum pack size was determined by the number of separate trails that were distinguishable. This was especially successful on river and creek ice where pack members tended to spread out.

Wolf population size is presented as a range, based on minimum and maximum numbers of wolves determined in each pack and adding 10% (Stephenson 1978) to the pack totals, to account for lone wolves in the area.

Whenever moose were located during surveys, calves and adults were classified by their differential body sizes. Caribou distribution was based on tracking sign observed.



RESULTS AND DISCUSSION

WOLF POPULATION STATUS

A minimum of 9 wolf packs were tracked in the study area (Table 1, Figure 3), representing a total population of between 57-64 wolves. In addition to the packs located in the study area, an exceptionally large (30-40 member) pack was tracked along the Black River, at the eastern study area boundary (Figure 3). This pack ranged in the Liard Basin to the east of the study area, where three separate observations were made of a similar large pack (39 wolves) nearby in the Hasselberg and Simpson Lakes area during March 1985 (Farnell, pers. comm.). This pack was not included in our population census of the study area. Based on maximum and minimum counts, mean pack size ranged from 5.8 wolves (SD=2.8) to 6.7 wolves (SD=3.3) per pack. Average pack size for unexploited or lightly harvested wolf populations in the Yukon, including Finlayson (Hayes and Farnell 1985), the Coastal Mountains (Hayes et al. 1985), the Teslin Burn (Hayes and Baer 1986), and the Nisutlin River area (Part 2, this report) averaged 7.7 wolves/pack (range=5.3 to 9.3

Table 1. Wolf packs located in the Wolf Lake study area.

Pack	No. Wolves		Source*
	min	max	
Caribou Lakes	5	5	Vs/Tr
Wolf Lake	4	4	Tr
Irvine Creek	10	12	Tr
Gravel Creek	6	8	Tr
Cabin Creek	3	3	Tr
Scurvy/Liard	11	11	Vs/Tr
Junkers Lake	5	6	Tr
Red River	3	3	Tr
Nisutlin Lake	6	8	Tr
Pack total	52	58	

* Vs denotes pack was seen during survey, Tr indicates pack was enumerated from trails.

wolves). Mech (1970) reviewed wolf pack records from various studies and determined most packs had 7 members or less. Minimum pack density in WLSA was 1.5 packs/1000 sq km.

Wolf sign was well distributed throughout the study area, mainly associated with riparian river and creek habitat, which was also used by wintering moose (see moose observations). We did not observe any concentration of wolves near Wolf Lake caribou herd winter range. However, from our survey experiences in Finlayson caribou winter range, it is extremely difficult to assess wolf activities without ground study, due to the heavy caribou trails obscuring wolf sign. Nevertheless, it was our impression that moose were an important prey species of study area wolves. We based this assumption on moose and wolf distribution (Figures 3 and 4). Certain packs that have access to wintering caribou may be hunting caribou, similar to the pattern of wolf predation in the FCMA (Hayes and Farnell 1986).

Only two ungulate mortality sites were recorded; both were moose (Figure 4).

Due to the closeness of the Finlayson and Wolf Lake study areas (Figure 1) we predicted that wolf reduction in the Finlayson area would have a negative effect on wolf distribution and density in the Wolf Lake area. Specifically, it is

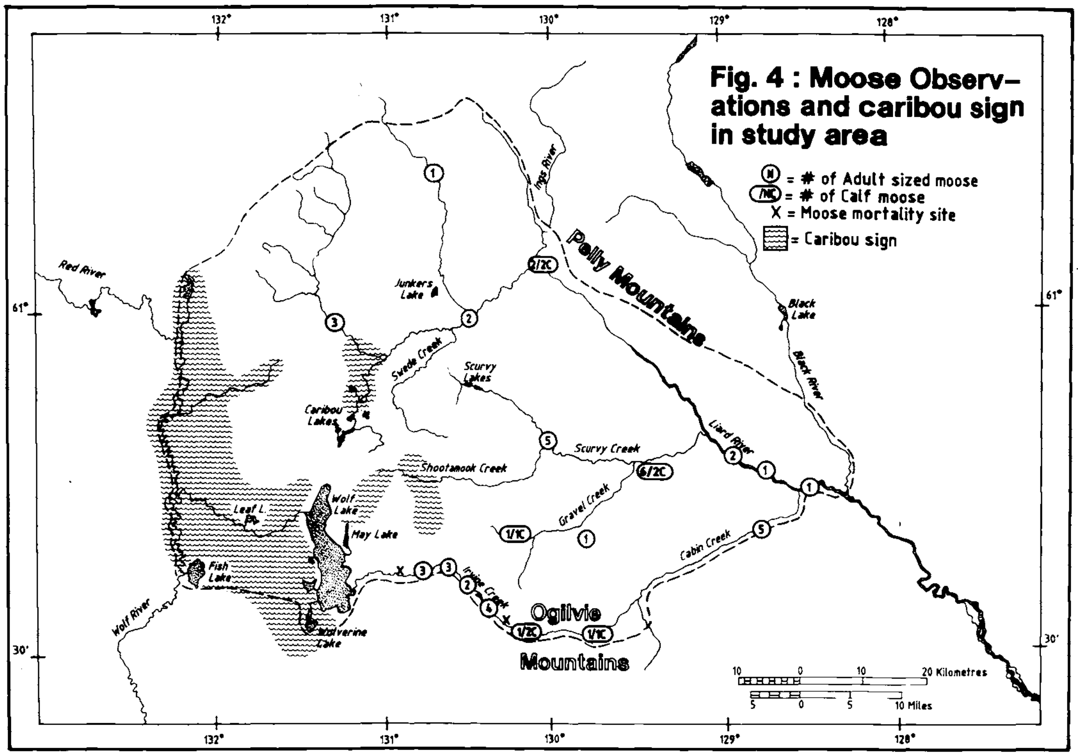


Fig. 4 : Moose Observations and caribou sign in study area

likely that, over the years, packs shot in the southern FCMA removal area also travelled in the northern portions of the WLSA. However, by comparing wolf densities between areas it appears reduction has had little measurable effect on reducing the WLSA population. In WLSA, wolf density was on the order of 9-11 wolves/1000 sq km, approaching the FCMA 1983 pre-reduction density of 12 wolves/1000 sq km (Hayes and Farnell 1985). In 1985, at the same time as this survey, the FCMA density was 4.6 wolves/1000 sq km (Hayes and Farnell 1986).

UNGULATE OBSERVATIONS

Nearly all moose sightings were made in riparian areas near major drainages (Figure 4). Because moose observations were incidental to wolf tracking, it can be argued that general moose distribution was not completely documented. However, survey flights crossed nearly all regions of the study area, and few moose or their sign were seen in subalpine areas. In the Cassiar and St. Cyr Mountain Ranges, moose were rare or absent. A total of 53 moose were classified into adult or calf age classes, including 45 adults and 8 calves. We consider this sample to be too small to make any assessment of population condition.

Caribou sign was restricted to the eastern portion of the study area (Figure 4). Continuous caribou sign was recorded along the Red and Wolf Rivers, terminating at Fish Lake. Light caribou sign was found on the upper drainage of Shootamook Ck. and in the Caribou Lakes area (Figure 4).

CONCLUSIONS

From this initial assessment of wolf density and distribution, a number of tentative conclusions may be drawn. First, based on average pack size and density, which fall within the range found for unexploited or lightly harvested populations in other Yukon areas, it appears that the Finlayson wolf reduction experiment has caused no corresponding decline in WLSA wolf density. From this, we conclude that the WLSA wolf population represents a suitable control population for the Finlayson wolf reduction experiment.

Second, wolf distribution results suggest that wolves were not apparently concentrating in caribou winter range, but traveled throughout the study area, mainly associated with river and creek riparian areas where moose were present. Due to tracking difficulties in caribou wintering areas, we could not completely determine wolf use in these areas. This is a shortcoming of the aerial census technique, and the only reasonable solution is to include ground studies in caribou wintering areas.

RECOMMENDATIONS

A wolf population inventory should be conducted in the Wolf Lake area immediately following the final year (1987) of the Finlayson wolf reduction to: a) measure the effects of five years of wolf reduction on a non-target wolf population bordering the removal area, and b) reassess the status of the Wolf Lake wolf population as a control to the Finlayson reduction.

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Part 2.

WOLF INVENTORY, NISUTLIN RIVER AREA

JANUARY 1987

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December 1987

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INTRODUCTION

In November, 1986, the first systematic moose (Alces alces) census was conducted along the Nisutlin River drainage of Game Management Zone 10 (Jingfors and Markel, 1987). In an attempt to gain a better understanding of the factors affecting moose demography in the area, a concurrent wolf (Canis lupus) population survey was proposed for the same area. From these data, a moose/wolf ratio could be calculated and the potential effects of wolf predation on Nisutlin area moose could be assessed.

In relation to wolf management objectives, a wolf census in the Nisutlin area represented the seventh inventory study area in the southern Yukon. It also completed a continuous arc of wolf inventory areas spanning the southern Yukon from east to west. Objectives of our studies were to:

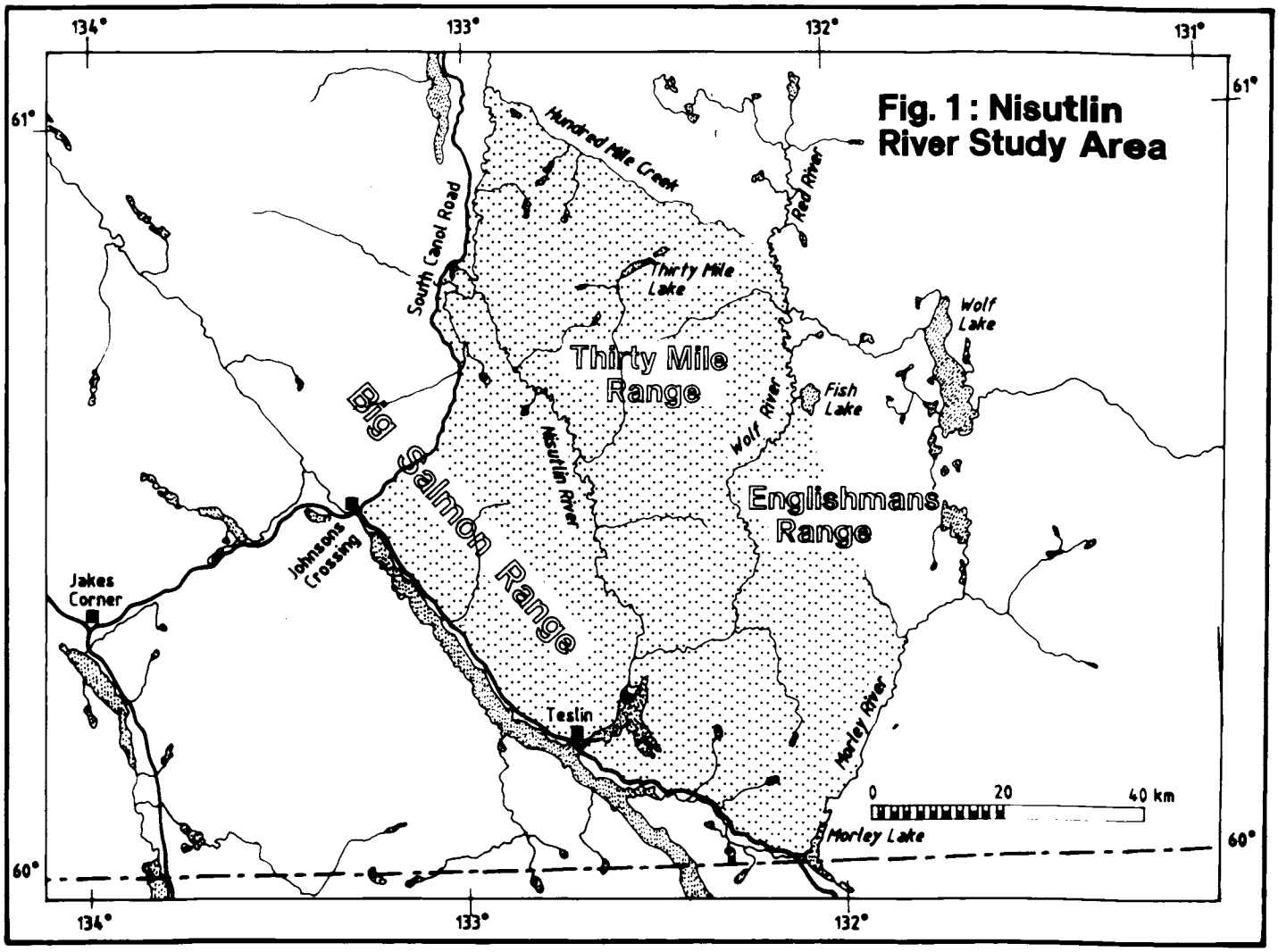
1. To census the resident wolf population, determine distribution, and calculate wolf density in the lower Nisutlin and Wolf River drainages.

2. To document general distribution of moose and caribou and record ungulate mortality sites, relative to wolf distribution.

STUDY AREA

The 4970 sq km Nisutlin River Wolf Study Area (Figure 1) was the same area surveyed for moose (Jingfors and Markel 1987) in November 1986. The areas is located predominantly within the Lake Laberge ecoregion described by Oswald and Senyk (1977); some of the eastern portion lies within the Pelly Mountains ecoregion. Most of the area is below timberline, with extensive tracts of mature timber in major valley bottoms.

The study area was bounded on the west by the South Canol Road, from Johnson's Crossing to kilometer 67, then up the Nisutlin River 15 km to the confluence of Hundred Mile Creek. The northern boundary was the demarcation between Game Management Subzones 10-10 and 10-21. The southern boundary was the Alaska Highway from Johnson's Crossing to the Morley River bridge. The eastern boundary followed Morley Lake, extending up Morley River about 15 km, then along the western slope of the Englishman's Range to Fish Lake, continuing up the Wolf River to its confluence with the Red River.



The Thirty Mile Range and the southern peaks of the Big Salmon Range are located in the study area (Figure 1). Several peaks within the area rise over 2000 m a.s.l.; most of the area lies between 600 and 1800 m.

Climate within the study area is relatively mild, with Teslin (elevation 688 m a.s.l) having a mean annual temperature of -1°C, and an average winter (November-March) temperature of -14°C. The annual mean precipitation at Teslin is 32.7 cm; snowfall averages 162 cm. The only other meteorological station within the study area is at Meadow Creek, 20 km north of Johnson's Crossing. This station, at 1200 m a.s.l. has an average March 1 snowfall of 93 cm.

Study area vegetation is typified by white spruce (Picea glauca) forests of varied density over most of the area. Black spruce (Picea mariana), either alone or in association with white spruce, is generally found on the wetter sites. Aspen (Populus tremuloides) occurs on warmer aspects, or in mixed stands with white spruce. Balsam poplar (Populus balsamifera) occurs locally on river flood plains or other

recent alluvial areas. Willow (Salix spp) is found on wet sites in lower elevation areas, or more typically, in subalpine areas. Alpine fir (Abies lasiocarpa) is also found in subalpine areas up to about 1300 m a.s.l. (Oswald and Senyk 1977). Stands of lodgepole pine (Pinus contorta) are scattered throughout the area, following an extensive fire history.

UNGULATE POPULATIONS AND DISTRIBUTION

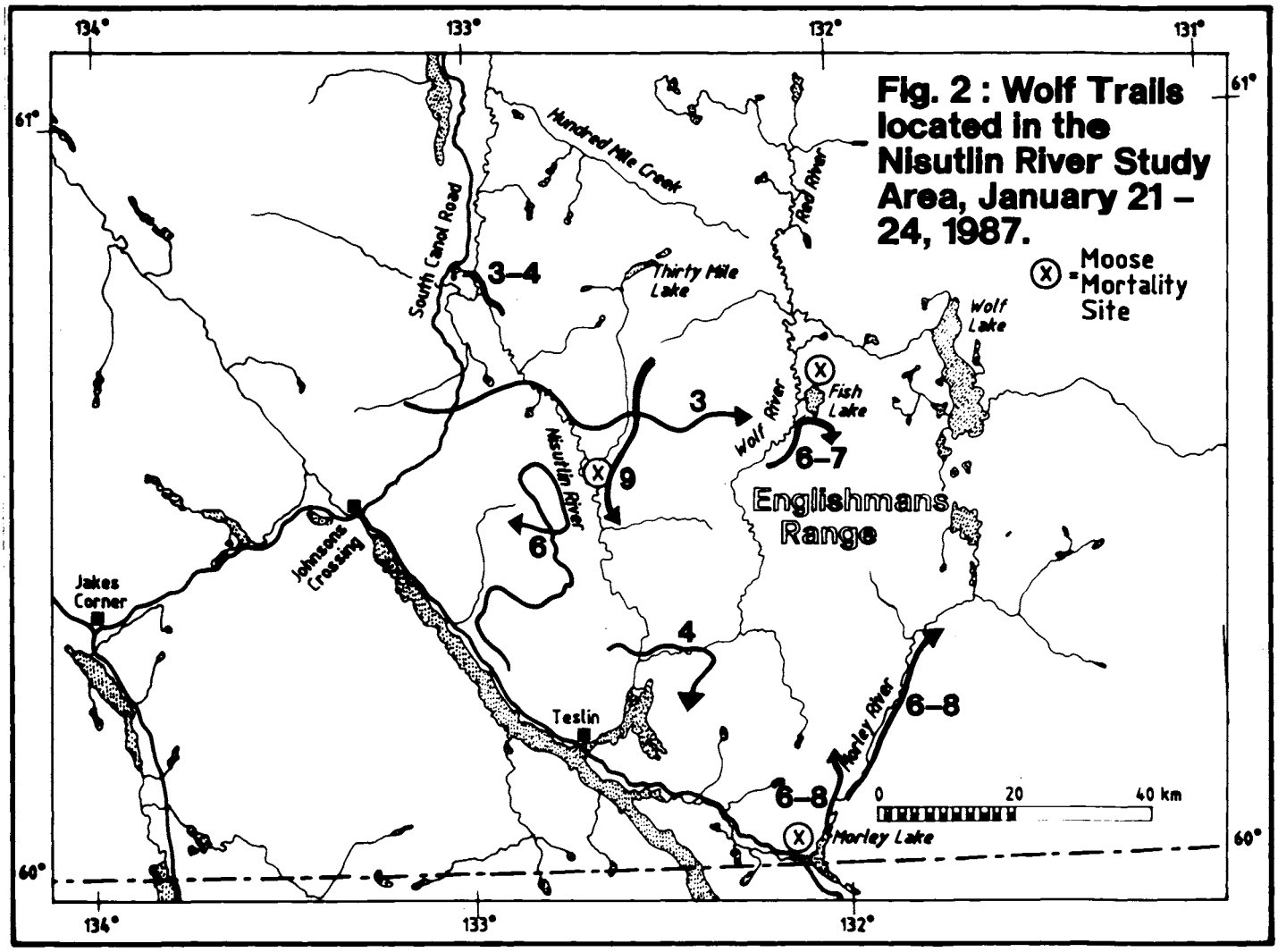
Moose

Using Gasaway's (1981) ratio estimator technique, Jingfors and Markel (1987) estimated 560 (19% variance at 90% C.I) moose ranged in the Nisutlin and Wolf River drainages in late fall, 1986. Calves represented 18% and yearlings were 13%, suggesting that productivity and juvenile survivorship was good in 1985 and 1986. However, overall moose density was low at 130 moose/1000 sq km; about one half the density (250 moose/1000 sq km) found in the the Coastal Mountains area near Whitehorse (Jingfors and Markel 1987).

During late fall, Jingfors and Markel (1987) located most moose in the subalpine ecotone in the study area. Apparently, by late winter, moose tend to move to lower elevations. Hoefs (1974 and 1976, cited in Jingfors and Markel 1987) recorded a density of 1.4 moose/sq km along the lower Nisutlin River in late February 1974, and 2.8 moose/sq km on the Nisutlin River delta in late February 1976. The delta is one of the most important known moose winter ranges in the southern Yukon.

Caribou

In March 1987, Farnell and McDonald (in prep.) censused the Wolf Lake woodland caribou (Rangifer tarandus caribou) herd. The majority of the herd was located north-east of our study area. Herd size was 666 (20% variance at 90% C.I.). Ninety one caribou were counted in the Hundred Mile Creek area, at the northern boundary of our study area (McDonald pers. comm.). During our survey, heavy caribou trails were present in this area.



METHODS

Wolf surveys were conducted from a Maule LR 7 and a PA 18 Supercub, between January 21-24, 1987, following previously described techniques (Part 1, this report). Snow conditions were ideal for tracking. Approximately 25 cm of fresh snow fell on 17-18 January. Weather during our survey period was usually clear skies or high scattered clouds, providing good trail definition.

While snow and weather conditions were considered ideal for tracking, the heavy timber in most of the study area required considerable tracking time for visual locations of packs. In total, 37 hours of flight time were spent. Survey coverages was about 140 sq km/hr.

RESULTS AND DISCUSSION

WOLF POPULATION STATUS

A minimum of 8 wolf packs were located in the study area (Table 1, Figure 2). Based on minimum and maximum pack sizes, and an adjustment of 10% for lone wolves (Stephenson 1978), we calculated a wolf population of between 47-52 wolves. Five of eight packs were seen by observers, one was estimated by tracks and verified by the public, one was observed by the public, and another was estimated from tracks only (Table 1).

Nisutlin wolf density was 9-11 wolves/1000 sq km; the same as the Wolf Lake study area (Part 1, this report), but only half the wolf density observed in the Teslin Burn (18 wolves/1000 sq km, Hayes and Baer 1986), located across Teslin Lake. This large difference in wolf density is correlated with moose density. In the Teslin Burn, Markel and Larsen (1985) observed 420 moose/1000 sq km; four times greater than the density recorded in the Nisutlin study area (Jingfors and Markel 1987).

Average minimum pack size in Nisutlin was 5.3 (SD=1.9) wolves/pack; nearly identical to 1985 average pack size (5.8) in the adjacent Wolf Lake area (Part 1, this report). Pack size was not significantly different ($P>0.05$) from the pack average of 7 wolves (SD=2.7) in the Teslin Burn in 1984 (Hayes and Baer 1986), despite the large difference in moose density between areas.

Pack density was 1.6 packs/1000 sq km, compared to 1.5 packs/1000 sq km in the Wolf Lake study area (Part 1, this report), and 2.3 packs/1000 sq km in the Teslin Burn (Hayes and Baer 1986).

MOOSE OBSERVATIONS

Moose were found at most elevations from treeline to valley floors. Unlike Hoefs (1974 and 1976, cited in Jingfors and Markel 1987), we did not observe concentrations along major drainages, but observed many moose in the forested mountain slopes, and a significant number of moose were seen in subalpine areas, at or near treeline. The exceptionally high concentrations of moose on the Nisutlin delta in February reported by Hoefs (1976) and also observed in 1985 (Yukon Fish and Wildl. Br. files), were not present during

Table 1. Wolf packs located in the Nisutlin study area, 1987.

Pack	No. Wolves		*Source
	min	max	
Wolf River	4	4	Vs
Morley Lake	6	8	Vs* Tr Pu
Sawtooth	6	6	Tr Pu
Thirtymile Ck	3	3	Vs**
Nisutlin	9	9	Vs*** Tr
Fish Lake	6	7	Vs**** Tr
Upper Thirtymile	6	6	Pu
Sidney Ck	3	4	Tr
Pack total	43	47	

* Vs denotes pack was seen, Tr indicates pack was enumerated from trails, Pu indicates public information.
* only one pack member seen.
** pack was seen on three occasions.
*** pack was seen by moose survey crew in November 1986, and caribou survey team in March 1987.
**** two pack members seen.

our survey. Our observations were a month earlier than previous reports, and it seems likely that moose had not reached late winter riparian areas.

MOOSE/WOLF RELATIONSHIPS

Using a minimum population of 47 wolves and Jingfors and Markel's (1987) moose population estimate (456-669), we calculate a ratio range of 10-14 moose/wolf, assuming wolf numbers did not change significantly between November and January.

Gasaway et al (1983) suggested that, in a simple wolf-moose system, a ratio of less than 20 moose/wolf indicated wolf predation was likely causing moose numbers to decline. In our study area, it appears moose are the primary prey of wolves. Woodland caribou were restricted to the northern edge of the study area. The 3 mortality sites recorded (Figure 2) were all moose.

The present moose/wolf ratio could indicate that wolves are presently regulating the moose population, and, in combination with human harvest, may explain the low moose density. Traditionally, the Nisutlin River has been an important moose hunting area for resident and Indian hunters. Between 1979-86 an average of 21 moose (SD=2.5) (Markel pers. comm.) were annually shot by non-Indian resident hunters. Indian harvest has been unknown, but a questionnaire was recently circulated to Indians in the Teslin area.

While data is insufficient to determine population trends of moose, the relatively high yearling (13%) and calf proportions (18%) in 1986 (Jingfors and Markel 1987) suggests that recent cohorts are surviving well, despite the low moose/wolf ratio.

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PART 3.

WOLF INVENTORY, NISLING RIVER AREA

MARCH 1986

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October 1987

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INTRODUCTION

The upper Nisling River area in the south-central Yukon is the focus of a co-operative Wood Bison (Bison bison athabaska) re-introduction program involving the Canadian Wildlife Service and the Yukon Department of Renewable Resources. A small herd of 34 animals were transported from Elk Island National Park, Alberta, in the spring of 1985, and released within a large holding compound on the upper Nisling River (Figure 1). Yearlings produced by this captive herd will eventually be released outside the compound, to begin establishment of a wild herd.

A wolf (Canis lupus) population survey of the upper Nisling River watershed was designed to provide wolf distribution and density information that can be used to guage the potential effect of wolf predation on this herd. Wolf population data from this area would also contribute to an ongoing, Yukon-wide inventory.

OBJECTIVES

The objectives of 1986 Nisling River wolf studies were:

1. to census the wolf population, document distribution, and evaluate wolf density in the study area.

2. to document the general distribution of moose and caribou.

STUDY AREA

The 4045 sq km Nisling River Study Area (Figure 1) included the upper reaches of the Klaza River, the southern flank of Rowlinson Creek, and all of the Nisling River drainage upstream of Schist Creek. The study area was bounded by Aishihik Lake on the south and by Rowlinson Creek and Klaza Mountain to the north. The eastern boundary was the height of land which delineates the Nisling River watershed between Decourcy Lake on the south and Rowlinson Creek on the north. The western boundary extended down Magpie Creek, across its confluence with Klaza River and then along the divide between the Klaza and Nisling watersheds, to the high ground of the Nisling range west of Stevens Creek.

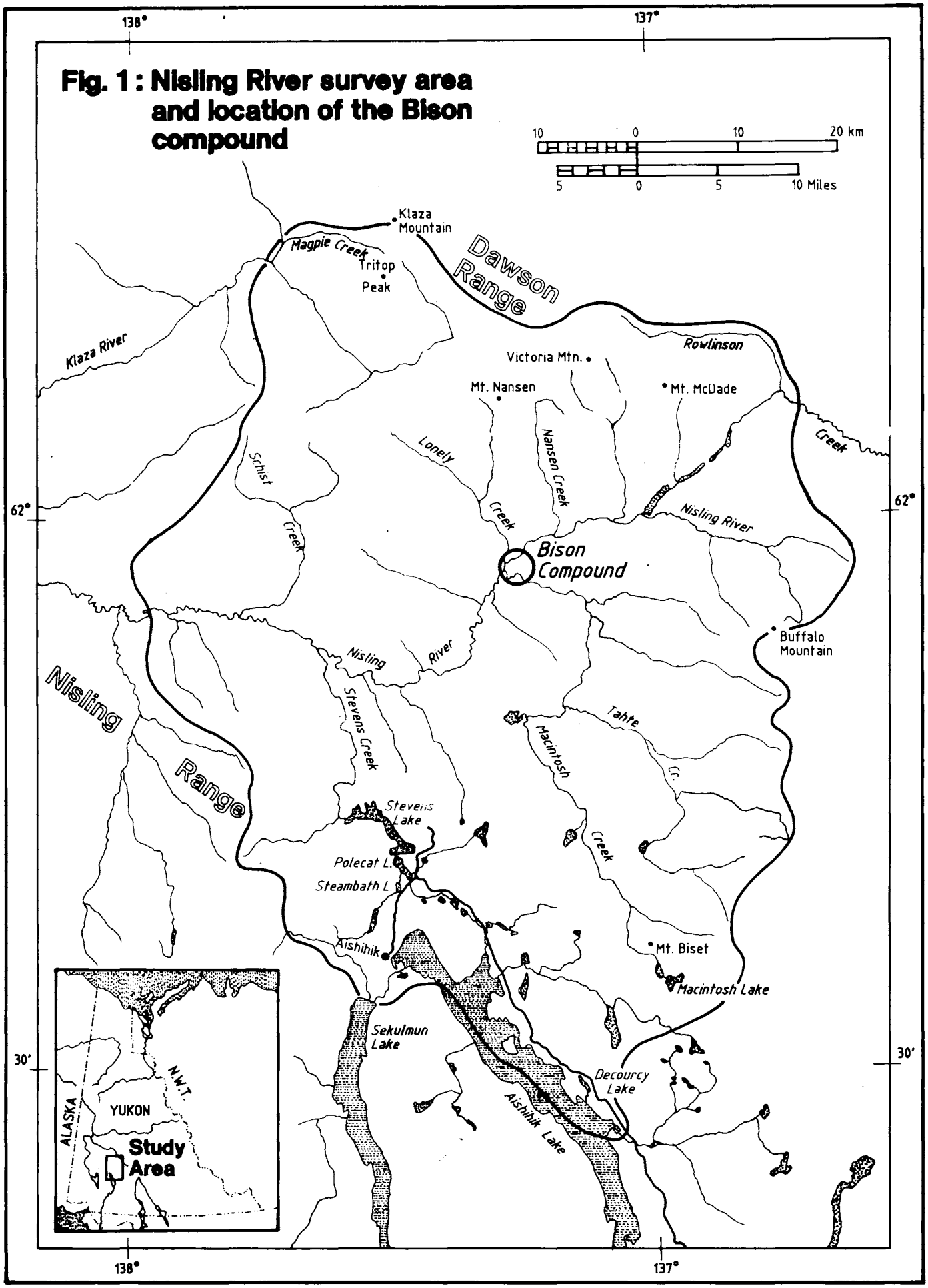

Fig. 1 : Nisling River survey area and location of the Bison compound

The study area was generally within the Dawson Range ecoregion described by Oswald and Senyk (1977). Characterized by smooth rolling terrain with moderate to deeply incised valleys, the area lies between 1000-1500 m above sea level; although some elevations exceed 1500 m.

The climate of the area is described as continental and cold, with a mean annual temperature of -7 C and annual precipitation of about 33 cm (Oswald and Senyk 1977). The 10 year average (1 March) snowdepth at Victoria Creek,in the northern half of the study area, is 37 cm (Peterson 1985) with a 30 year average annual snowfall, recorded at Aishihik Lake, of 89 cm (Environment Canada 1973). Vegetation within the study area is characterized by open black spruce (Picea mariana) forest on north and east facing slopes. South facing slopes are mainly spruce forest of varied density, interspersed with stands of aspen (Populus tremuloides), willow (Salix spp.), and birch (Betula spp.). Shrub birch and willow form extensive stands over much of the area, from valley bottom to well above timberline. Much of the valley bottom drainage is impeded, giving rise to extensive areas of sedge tussocks which support willow and various ericaceous (Arctostaphylos spp., Ledum spp., Vaccinium spp.,) shrubs (Oswald and Senyk 1977).

UNGULATE POPULATIONS AND DISTRIBUTION

There were some wildlife surveys in the area prior to this wolf population survey. Dall Sheep (Ovis dalli) populations in the area were first surveyed by the Yukon Game Branch in 1974. Sheep numbers were very low, as most of the survey area offers no escape terrain and limited winter range (Hoefs 1975).

Information on woodland caribou (Rangifer tarandus caribou) was sketchy, although it was known that caribou were present in portions of the study area during winter (Hoefs 1975, Larsen 1981). Recent Yukon Fish and Wildlife Branch surveys, completed in early winter 1987, identified a herd of about 400 animals in the Dawson Range; their range extended south into the study area (Farnell and Lortie, 1987). These animals are presently under study to determine whether they are a discrete herd (Klotassin herd), distinct from the Ruby Range herd to the west (Larsen 1981).

Moose (Alces alces) population information in the survey area was limited. The southern portion of the survey area, east of Macintosh Creek and south of the Nisling River, was included in moose population surveys conducted by the Yukon Wildlife Branch in late fall 1981 (Larsen 1982). Results from Larsen's 1981 survey indicated moose were at low density in the Nisling River wolf survey area (Larsen 1982). Lortie (pers. comm.) indicated moose were plentiful in this

area during the early-mid seventies; although these observations would refer to late fall and early winter distributions only.

METHODS

Aerial surveys were conducted from a P-18 supercub fixed wing aircraft in the period 13-15 March 1986 following previously described techniques (Part 1 this report). Sixteen hours were flown. Survey coverage was at a rate of 220 sq km/hr.

Whenever moose were located during surveys, calves and adults were classified by their differential body sizes. The locations and number of caribou were also recorded.

RESULTS AND DISCUSSION

WOLF POPULATION STATUS

Wolf sign was very infrequent throughout the study area (Figure 2), and mainly associated with riparian river and creek habitat. Because much of the survey area was open black spruce forest, open sedge meadow, or subalpine willow flats, coverage was considered efficient and effective. Weather conditions were good for surveying; sunny skies prevailed, with little wind to disturb wolf trails at lower elevations.

A minimum of 4 wolf packs were tracked in the study area (Table 1), representing a total wolf population estimate of between 13-14 wolves (see methods, Part 1 this report).

The minimum wolf density estimate for the area was 3.2 wolves/1000 sq km; extremely low compared to other studied populations in the southern Yukon. Other populations, thought to be naturally regulated, showed much higher densities. In the Finlayson Lake area, the minimum wolf density before removals was 11.9 wolves/1000 sq km (Hayes and Farnell 1985), Wolf Lake was 9.3 wolves/1000 sq km (Part 1 this report) and the Nisutlin area supported 9.5 wolves/1000 sq km (Part 2 this report).

Wolf density was more comparable to the Finlayson Lake reduction area after 3 years of removals, where densities in March 1986 were 4.6 wolves/1000 sq km (Hayes and Farnell 1987).

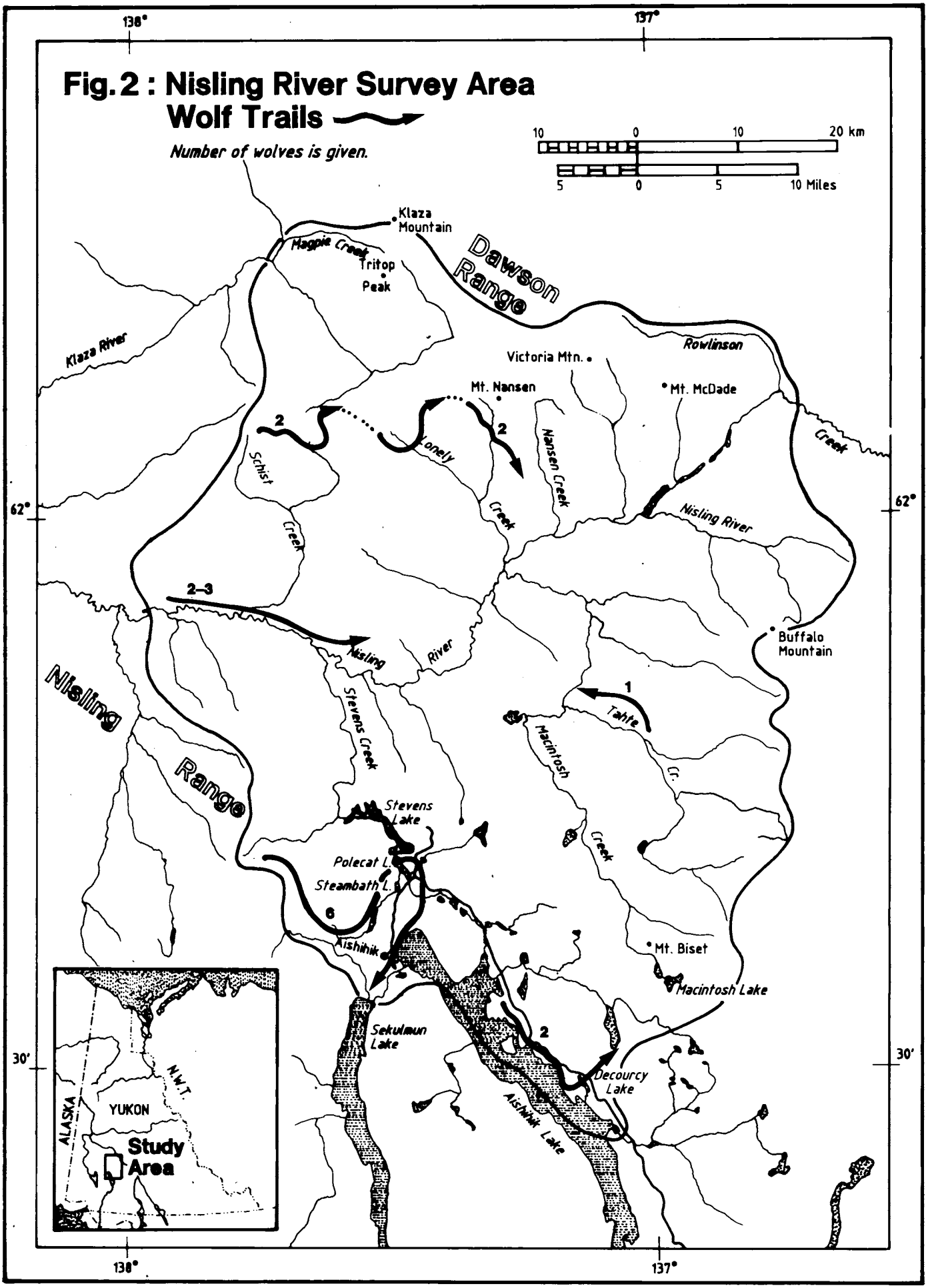
138°
137°
Fig. 2 : Nisling River Survey Area
Wolf Trails
Number of wolves is given.
10 0 10 20 km
5 0 5 10 Miles
Klaza Mountain
Magpie Creek
Tritop Peak
Dawson Range
Klaza River
Rowlinson
Victoria Mtn.
Mt. Nansen
Mt. McDade
Lonely
Schist Creek
Nansen Creek
Creek
Nisling River
62°
2
2
2–3
Nisling River
Buffalo Mountain
Nisling Range
Stevens Creek
1
Tahtè
Macintosh Cr.
Stevens Lake
Polecat L.
Steambath L.
6
Creek
Aishihik
Mt. Biset
Macintosh Lake
Sekulmun Lake
2
Decourcy Lake
Aishihik Lake
30'
N.W.T.
YUKON
ALASKA
Study Area

Table 1. Wolf packs located in the Nisling River study area.

Pack	No. Wolves		Source
	min	max	
Lonely Creek	2	2	Tr
Decoursey Lake	2	2	Tr
Stevens lake	6	6	Tr
Nisling River	2	3	Tr
Total	12	13	

* Tr indicates pack was enumerated from trails.

Based on minimum and maximum estimations, average pack size ranged from 3 (SD=2.0) to 3.25 wolves (SD=1.9) per pack. Average pack size may be an important indices of wolf population trends in the Nisling River study area. The average minimum pack size of 3.0 wolves/pack was much lower than the average pack size for 5 naturally regulated wolf populations surveyed in the Yukon, which ranged between 5.3 and 9.3 wolves/pack, and averaged 7.7 wolves (Part 1 this report).

Average pack size in the Nisling River area is comparable with moderately to severely exploited populations in other areas. The average, late winter pack size of the Finlayson Lake wolf population after 5 years of severe (>70%) wolf reduction was 4.0 wolves/pack (Hayes and Farnell in prep). In the Coast Mountain study area of southwest Yukon, Hayes and Baer (in prep.) reported an average pack size of 3.6 wolves/pack following 3 years of >44% reduction.

It seems significant that a single pack (Stevens Lake) constituted 50% of the entire study area population (Table 1). Farnell and Lortie (1987) observed a pack of 9 wolves at the head of the Selwyn River, 40 km north of our survey area, in caribou winter range. The observation of at least two packs in the region with normal pack sizes may indicate that the small average pack size, and the subsequent low wolf density of the study area, reflects local, Nisling River drainages, and not broad regional conditions.

Based on past hunter and trapper harvest returns, the Nisling River area wolf population was thought to be naturally regulated. The apparent low density ungulate populations (see ungulate sections) observed during this survey

support the assumption that low wolf densities are a product of low ungulate densities. However, it is also possible, in view of the incidental nature of our assessment of ungulate distribution, that the low wolf densities are a result of unreported wolf harvest. The lack of comprehensive ungulate population data for the study area and the difficulty in determining levels of unreported harvest limits our ability to make a conclusive statement on regulating factors.

CARIBOU OBSERVATIONS

At the turn of the century the Nisling River area, along with much of the Dawson Range Mountains to the north, was occupied by the Fortymile caribou herd (R.Farnell pers. comm.). The Fortymile herd is thought to have disappeared from this area by the late 1940's. Today, there are scattered groups of caribou in the area; although their origin is unknown.

During the wolf survey period, 29 caribou were counted, the majority being seen on upper Macintosh Creek. A group of 6 caribou were seen within 2 km of the Bison compound. Caribou sign was also recorded along most of Macintosh Creek, the lower reaches of Tahte Creek, Tritop Mountain and a 20 km section of the Nisling River downriver from the Bison Compound (Figure 3). An accurate count was not possible given the nature of our survey techniques; but we estimate less than 100 animals ranged in our study area.

MOOSE OBSERVATIONS

Nearly all of the 14 moose observations were recorded in riparian areas in the lower elevation drainages. These were classified into adult or calf age classes, including 13 adults and 1 calf (Figure 3).

The moose density estimate in the 1981 survey, which included a portion of the wolf study area, was 104 moose/1000 sq km, with a calf cow ratio of 23 calves/100 cows (Larsen 1982).

Larsen's (1982) moose survey revealed that moose densities within the Nisling River wolf study area were very low compared to the rest of the suvey area. Our incidental observations suggest numbers have remained low, and this may explain the low wolf numbers there.

In addition to caribou and moose, 8 feral horses were recorded A herd of unknown size established here prior to the 1950's.

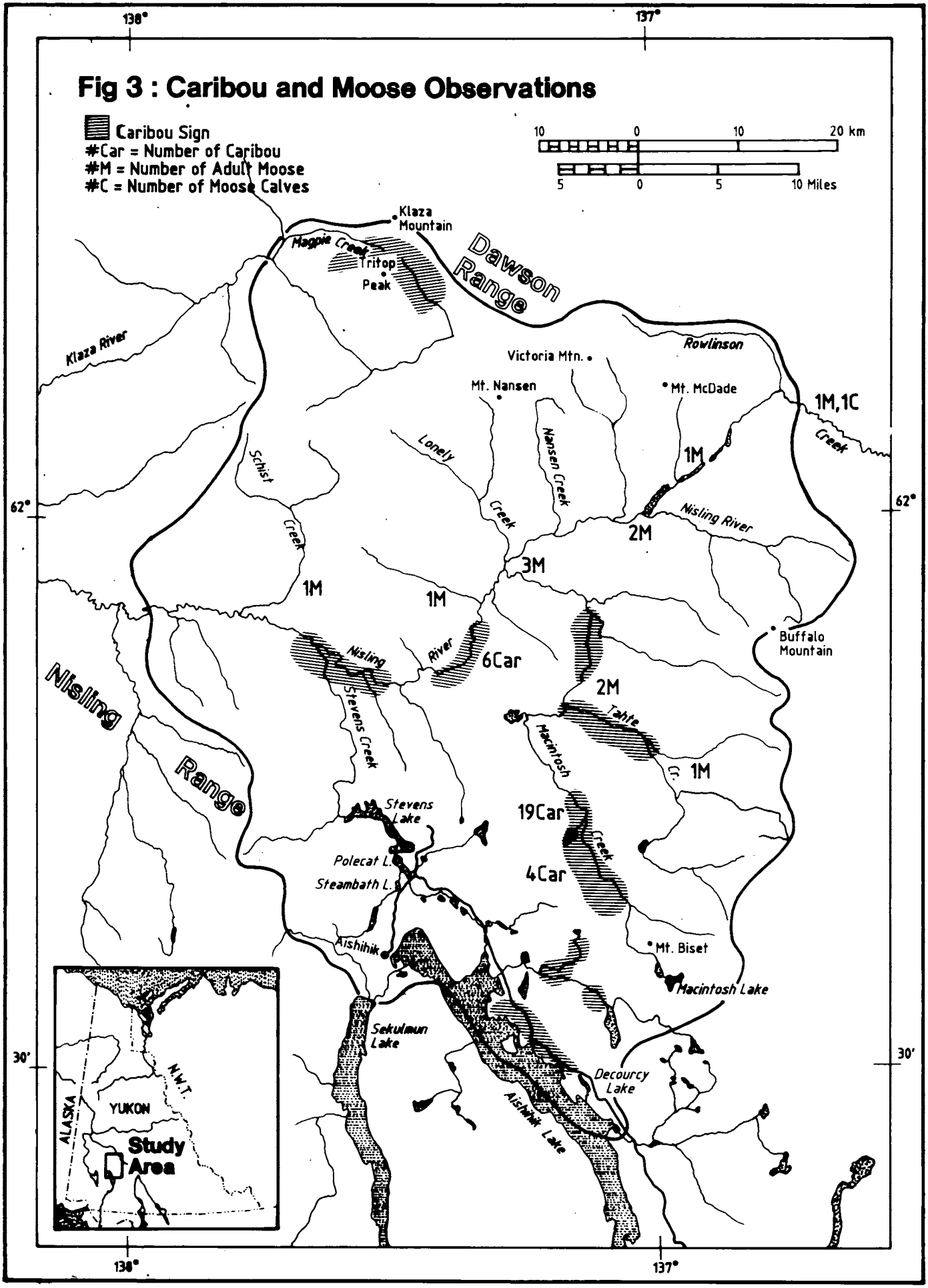
Fig 3 : Caribou and Moose Observations
Caribou Sign
#Car = Number of Caribou
#M = Number of Adult Moose
#C = Number of Moose Calves
10 0 10 20 km
5 0 5 10 Miles
138°
137°
62°
30'
Klaza Mountain
Maggie Creek
Tritop Peak
Dawson Range
Klaza River
Victoria Mtn.
Rowlinson
Mt. Nansen
Mt. McDade
1M,1C
Creek
Schist
Creek
Lonely
Creek
Nansen Creek
1M
Nisling River
2M
3M
1M
1M
Nisling
River
6Car
Buffalo Mountain
Nisling
Range
Stevens Creek
2M
Tahtè
Cr.
1M
Macintosh
Creek
Stevens Lake
19Car
Polecat L.
Steambath L.
4Car
Aishihik
Mt. Biset
Macintosh Lake
Sekulmun Lake
Decourcy Lake
Aishihik Lake
ALASKA
YUKON
N.W.T.
Study Area

CONCLUSIONS

We interpret that the small pack sizes and low density in the survey area are not likely a result of human exploitation, but are probably a response to a low density prey population, although this is inconclusive. We acknowledge that the small study area size does restrict conclusive evidence as to wolf population size and predator prey relationships within the broader region. We do believe from our findings that winter prey populations appear to be at low density in the study area and likely influence wolf activity and abundance in the area. Moose numbers seem especially low within the area, with individuals sparsely distributed. Caribou, although present within the area, are in small groups and represent only a marginal prey base.

RECOMMENDATIONS FOR FURTHER STUDIES

It is recommended that the Nisling River study area be re-surveyed during an early winter period (November-December) to provide a larger data base on wolf population demography. Wolf density and distribution should be examined in relation to the Klotassin herd winter range, with a northern extension of the wolf survey boundary. For an accurate picture of the regional wolf population status the study area should probably be greater than 5000 sq km.

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