A SURVEY OF THE MT. GOODENOUGH DALL'S SHEEP HERD IN 1983

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INTRODUCTION

The Mt. Goodenough (locally called Black Mountain) population of Dall's Sheep was first defined by Hoefs (1978). He identified the Rat River, Bell River, the headwaters of Cache Creek and Willow River and Mt. Goodenough, their major wintering area, as being the outer bounds of this population. The Mt. Goodenough population represents the northern limit of sheep distribution in the Mackenzie - Richardson Mountains, although latitudinally other populations in the Yukon and Alaska occur further north than the Mt. Goodenough population. A second population of Dall's Sheep in the northern Richardson Mountains, called the Mt. Millen population (Hoefs 1978) includes sheep occupying the area south of Rat River, primarily the Sheep Creek drainage.

Simmons (1973) estimated a total of 500 sheep in the northern Richardson Mountains. Hoefs (1978) concluded that there were 220-240 sheep in the area north of Rat River and 70-80 south of there. In a study considering all of the Richardson Mountains north of the Rock River as well as the Firth River area, Nolan and Kelsall (1977) estimated a population of 500 sheep. Nolan and Kelsall also stated that 150-180 Dall's Sheep use Mt. Goodenough as winter range each year. The most recent study by Males (1979) estimated 190 sheep for the area north of Rat River (Mt. Goodenough population) and the Sheep Creek drainage south of Rat River.

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This study was designed to estimate the size of the Mt. Goodenough population and the Sheep Creek portion of the Mt. Millen population. This area is essentially that considered by Males although my aim was to obtain a more thorough coverage than Males through using more flying time and a different type of survey aircraft.

MATERIALS AND METHODS

Although Dall's sheep with their white pelage would be more obvious against a snow-free background I decided to conduct this survey in April before any melt had occured. Other studies indicated that the sheep would still be concentrated around Mt. Goodenough, enabling a determination of the present day use of this winter range. Also, if flying was restricted to bright days tracks would be readily visible allowing us to delimit areas of recent use and to locate sheep through active searching of the general area where tracks were sighted. Finally, past studies suggested that bands of sheep wintering around Mt. Goodenough break-up and spread as far west as the Bell River possibly resulting in a less precise count than would be obtained from larger, more concentrated bands.

I adopted the drainage survey technique used commonly for aerial surveys in mountainous terrain and for patchily distributed species (Hoefs 1978). Each drainage in the study area was flown by following the contours around the complete rim of the drainage. The exact elevation varied according to the location of treeline, steepness of slope and ruggedness of slope. Most drainages were started at the lower end and followed around ending at the lower end once again.

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A Fairchild Porter aircraft was used and its excellent short takeoff and landing characteristics enabled a thorough search of slopes, basins and narrow valleys. A fixed wing aircraft was chosen primarily because of cost and possibly reduced stress on the sheep compared to a rotary winged aircraft.

Airspeed while surveying varied considerably depending on terrain but was usually 100-120 kph. That portion of the slope broadside to and above the aircraft was scanned by observers in the right front and rear seats. Four different observers, in addition to myself, were involved at some point during the study. All sightings of sheep were plotted on 1:250,000 scale maps. If tracks only were observed, several passes were made until either the sheep were sighed or we were satisfied that they were no longer in the area. At first I attempted to classify all sheep sighted according to rams, ewes and yearlings, however, problems to be discussed later resulted in the abandonment of this aspect of the study.

In addition to flying all drainages I gave Mt. Goodenough intensive coverage on the last day of flying in an attempt to obtain an estimate as precise as possible of sheep using this key winter habitat. All slopes, plateaus and small drainages around the mountain were inspected from low level (30-50m) at the slowest possible airspeed. The locations and numbers of sheep at each sighting were recorded in a manner similar to the preceeding portion of the study.

RESULTS

A total of 13 hours of survey time were flown in this study (Fig. 1) during 14-15 and 18 April. Clear, sunny days resulted in good observability of both sheep and tracks. In most cases sheep were observed immediately, although sometimes recent tracks indicated the presence of sheep which we subsequently located after several passes of the slope. A total of 43 sheep were seen during the

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intensive survey of Mt. Goodenough (Fig. 2) compared to 38 during our initial coverage of this area on the first day of surveying (Fig. 1). I estimate that 15 sheep were observed on Mt. Goodenough during the first survey that were not seen during the intensive survey as evidenced by group size and their locations; it is unlikely that sheep would move and regroup to any extent during the 5 days over which this survey was carried out. There were, therefore, a minimum of 58 different sheep on Mt. Goodenough during the study period. In addition, we saw 10 sheep away from Mt. Goodenough (Fig. 1), the furthest being a group of 7 along the Bell River for a total of 68 sheep seen in this study. Tracks but no sheep were observed at two locations, in the Bear Creek drainage. In some locations, especially the Fish Creek and Little Bell River drainages, heavy caribou sign ruled out the possibility of relying on tracks for locating sheep.

My initial attempts at classifying all sheep resulted in considerable uncertainty. I could differentiate only the oldest rams with any reliability. The brief opportunity for a close view and my inexperience with sheep combined to preclude any separation of ewes, young males and yearlings. Perhaps with repeated passes at individual bands of sheep I could have obtained a more precise classification but harassment of the animals would have been excessive.

Despite excellent visibility no sheep or tracks were sighted south of the Rat River, namely the Sheep Creek drainage and the two smaller drainages immediately west of it (Fig. 1).

One wolf was sighted in the area of the upper Little Bell River.

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DISCUSSION

This study suggests that the Mt. Goodenough Dall's Sheep population has declined further over the last four years. Males (1979) saw 145 sheep compared to 68 in approximately the same area in the present study. If it is assumed that observers did not see 25 per cent of the sheep, an assumption of Males also, then there are now approximately 85 present compared to 181 estimated by Males in 1979. Furthermore, the population's winter distribution appears to be further reduced from the earlier studies. Few sheep were recorded away from Mt. Goodenough whereas Males saw approximately 70. Likewise, the number of sheep wintering on and near Mt. Goodenough apparently has declined from earlier studies such as Nolan and Kelsall (1977) and Males (1979) who indicated 150-180 and 90 sheep respectively around Mt. Goodenough during their studies. In addition, Males saw 6 sheep at Sheep Creek (Mt. Millen population) whereas in this study none were seen.

Simmons (1973) and Hoefs (1978) singled out overharvest as likely the major cause of the steady decline in the Mt. Goodenough population. Even as recently as 1978 hunting pressure appeared to be high. During the last 2-3 years, however, N.W.T. Wildlife Service records suggest that the take by Aklavik hunters has declined to 7-10 per year from as many as 60 in 1972-73 (Simmons 1973). This seemingly light hunting pressure may still be excessive, since it exceeds the safe maximum harvest rate of 5 per cent suggested by Hoefs (1978). Such a small, seasonally concentrated population may not be able to withstand any hunting mortality, especially if the take includes ewes.

Other potential factors contributing to the high mortality rate of the Mt. Goodenough population are not obvious. In all of the aforementioned studies, predators have never been observed in numbers large enough to raise suspicion. Sheep inhabit climax alipine communities thus it is unlikely that changes in range quality could contribute to the decline.

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Nichols (1980) indentified severe winters, namely above-normal temperatures causing crusting combined with higher than average snowfall, as the cause of severe "crashes" in certain sheep populations in Alaska. Unfortunately there are no weather records for the Richardson Mountains over the last 20 years, and the closest station is Inuvik located at a lower elevation and 90 km away which makes examination of winter weather in the Richardson's difficult. Average monthly temperature data for Inuvik over the last 20 years (Fig. 3) (Department of Environment Climatological Records) indicate that for the months of November-April average temperatures have remained well below freezing with only a very slight warming trend over the 20 years. There does not appear to have been any change in trend between the first 10 years and the last 10 years when the decline of sheep in the northern Richardson Mountains occurred. In October, when weather is generally most variable and icing conditions are most likely to occur, the monthly average temperatures were relatively constant over the last 20 years. If we examine the number of days each October since 1963 where the temperature has risen to at least $-2^{o}C$ we find that this also has remained relatively constant. In short, nothing points to warmer winter weather during the last 10 years as a factor in the decline of Dall's sheep in the northern Richardson Mountains.

Disease has never been shown to cause declines in populations of Dall's sheep (Nichols 1980). This factor would be difficult to examine in the case of sheep in this study because of the apparent dearth of hunter killed specimens and the obvious undesireability of securing sheep specifically for necropsy purposes. One technique of possible effectiveness would be intensive ground search of the wintering area around Mt. Goodenough for late winter mortality (March-April). If disease or parasites are contributing to high mortality, then they would be expected to exert their maximum influence at times of greatest stress, namely late winter when physical condition is poorest as a result of inadequate nutrition. Effective examination of carcasses would only be possible a short time after death which may pose a

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serious obstacle condisering the size of the area, scavengers, and the manpower likely available for such a project.

Hoefs (1978) summarized the data on productivity of the Mt. Goodenough population. The lamb: ewe ratio was found to be close to 40:100 in studies done in 1972 and 1977 which approximates the results from other widely separate populations in the Yukon and Alaska. However, as Hoefs points out the very limited data on first year survival indicating 13 and 7 yearling: 100 ewes (DeBock 1971 in Hoefs (1978); Nolan and Kelsall 1972) is cause for concern. Because no data has been collected on lamb production and yearling survival of the Mt. Goodenough population since 1977 I propose that beginning in May 1984 yearly field studies be undertaken to monitor these population parameters. Other than the placement by helicopter such a study could be performed at small cost by a two person team prepared to spend a 2-3 week period, pre-and post-lambing, in the vicinity of Mt. Goodenough before the sheep disperse westward for the summer. It would be advantageous if disease investigations outlined earlier could be done in conjunction with the productivity studies but, because of the warmer weather in May and possible carcass deterioration, two separate study periods would be required.

Hunters and government must decide on the social and political importance of ensuring that this sheep population is not extirpated. Emotional and well publicized attention has already been given these sheep in southern media. Delta hunters and trappers as well as wildlife managers in the Northwest Territories must give serious consideration to what the loss of the Mt. Goodenough population will mean to their credibility as responsible and competent users and conservers of wildlife. Once this population disappears re-colonisation within reasonable time remains doubtful because of its already semi-isolated nature and its location at the very fringes of major Dall's sheep range in the Yukon and western Northwest Territories.

.../8

ACKNOWLEDGEMENTS

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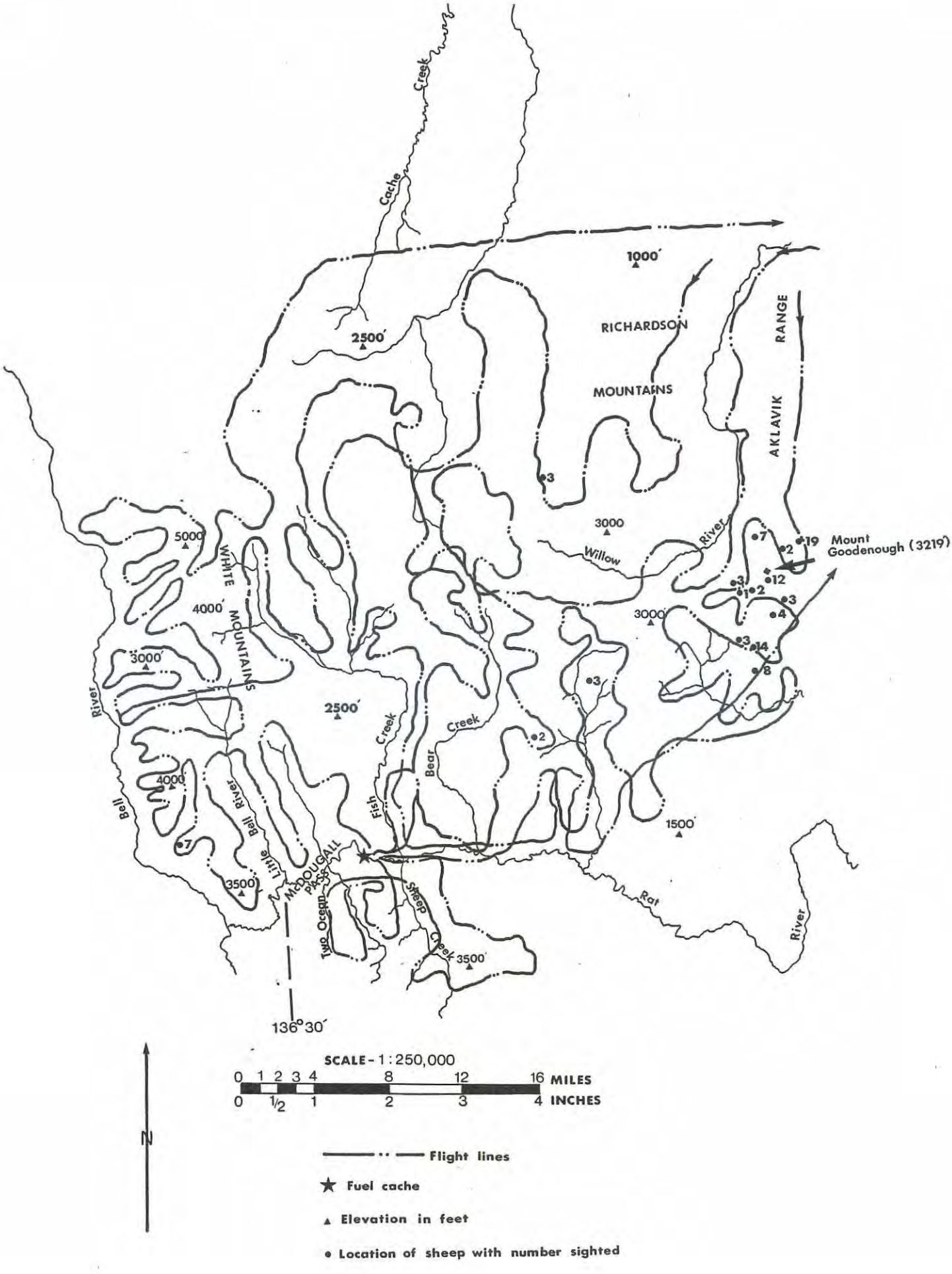
Figure 1: Area surveyed and the location and numbers of Dall's sheep sighted.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RICHARDSON
MOUNTAINS
AKLAVIK RANGE
2500'
3000
Willow River
Mount Goodenough (3219')
5000'
WHITE MOUNTAINS
4000'
3000'
River
Bell
2500'
Fish Creek
Bear Creek
4000'
Bell River
Little
McDOUGALL PASS
Two Ocean
Sheep Creek
3500'
1500'
Rat River
136°30'
SCALE - 1:250,000
0 1 2 3 4 8 12 16 MILES
0 1/2 1 2 3 4 INCHES
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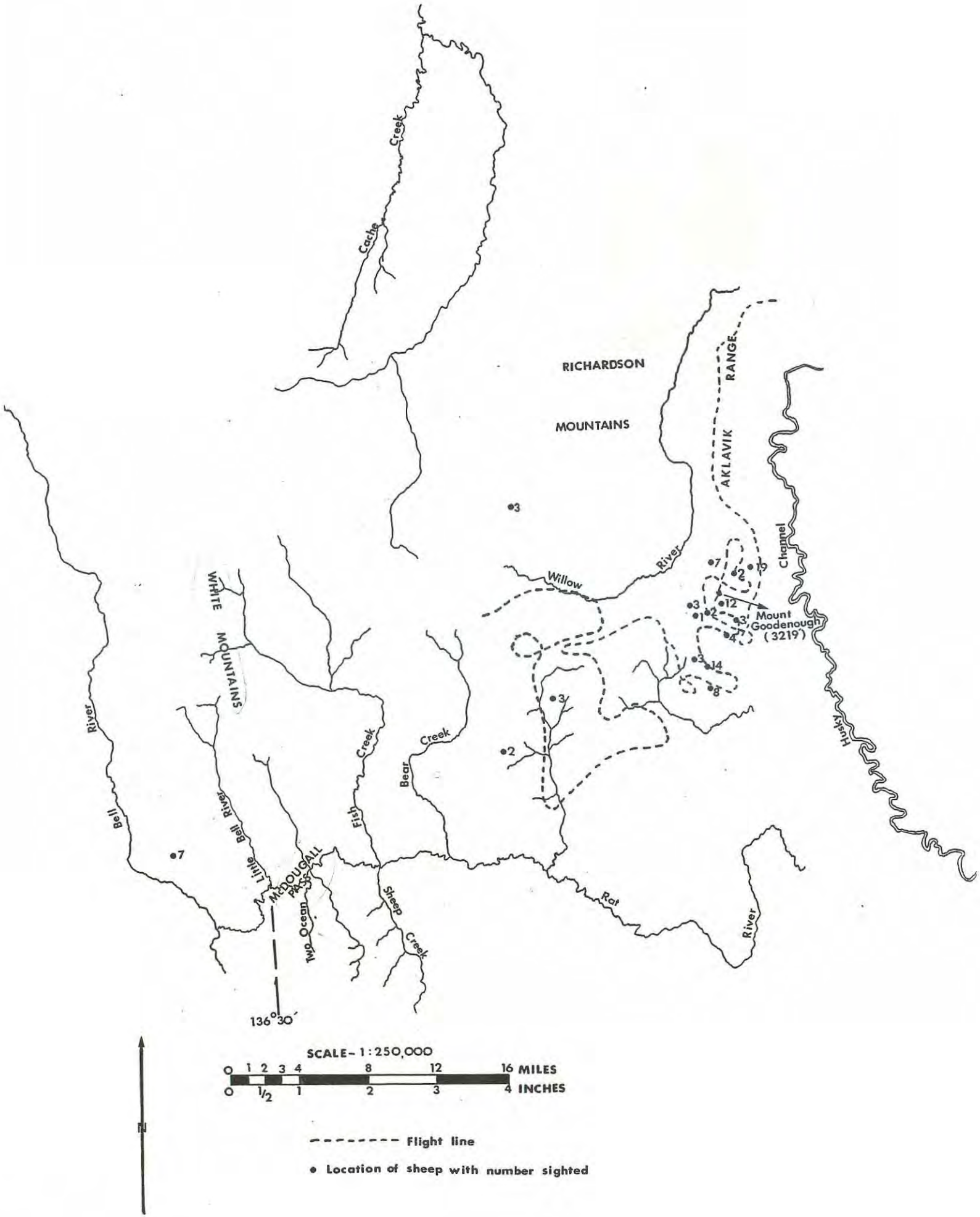
Flight lines
Fuel cache
Elevation in feet
Location of sheep with number sighted

Figure 2: Location and numbers of Dall's sheep sighted during the intensive surveying of Mt. Goodenough.


Cache Creek
RICHARDSON MOUNTAINS
AKLAVIK RANGE
Channel
Willow River
WHITE MOUNTAINS
Mount Goodenough (3219')
Bell River
Little Bell River
McDOUGALL PASS
Two Ocean
Fish Creek
Bear Creek
Sheep Creek
Rat River
Husky
136°30'
SCALE- 1:250,000
0 1 2 3 4 8 12 16 MILES
0 1/2 1 2 3 4 INCHES
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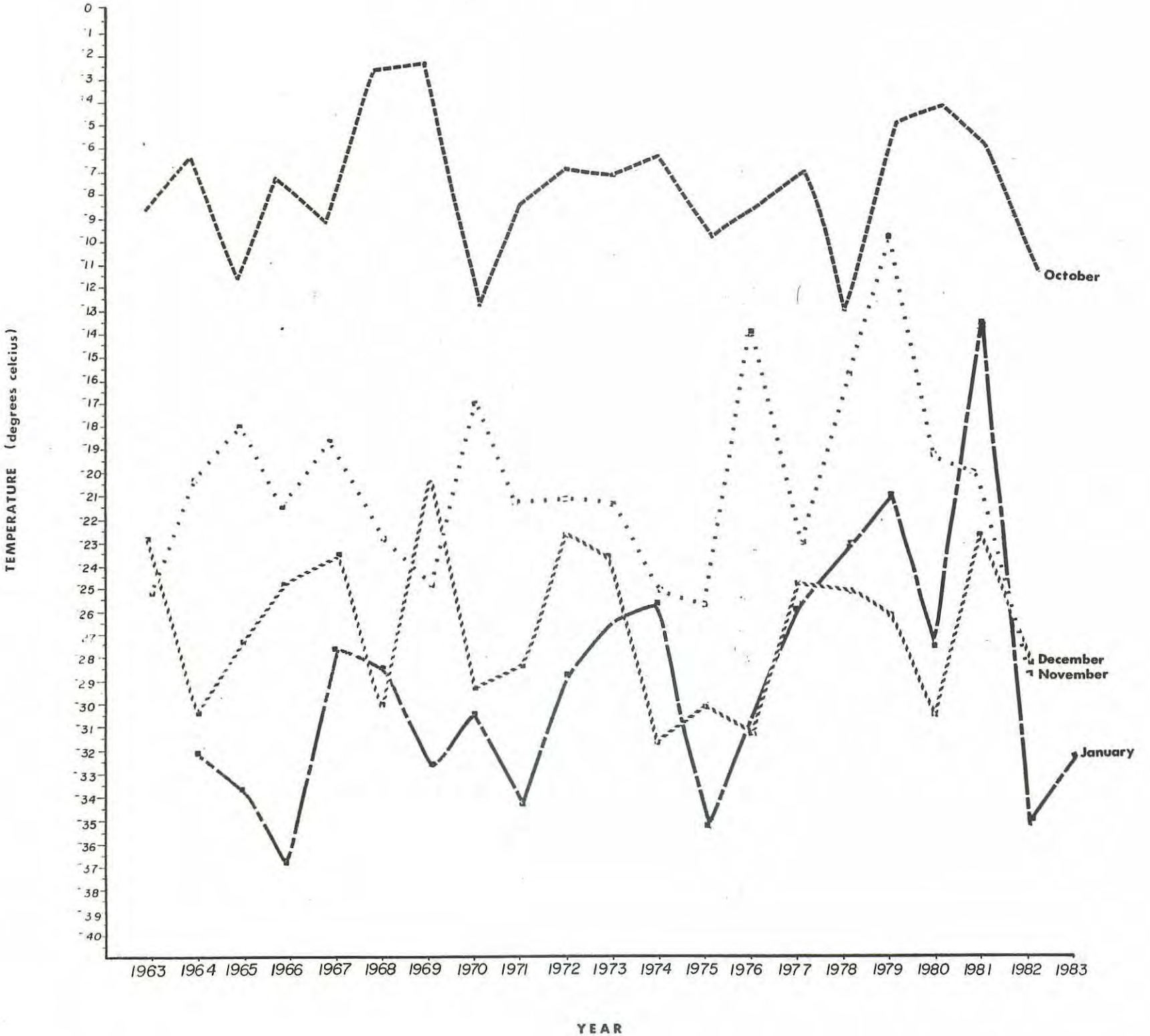
Flight line
Location of sheep with number sighted

Figure 3: Mean monthly temperatures, October-April 1963-83.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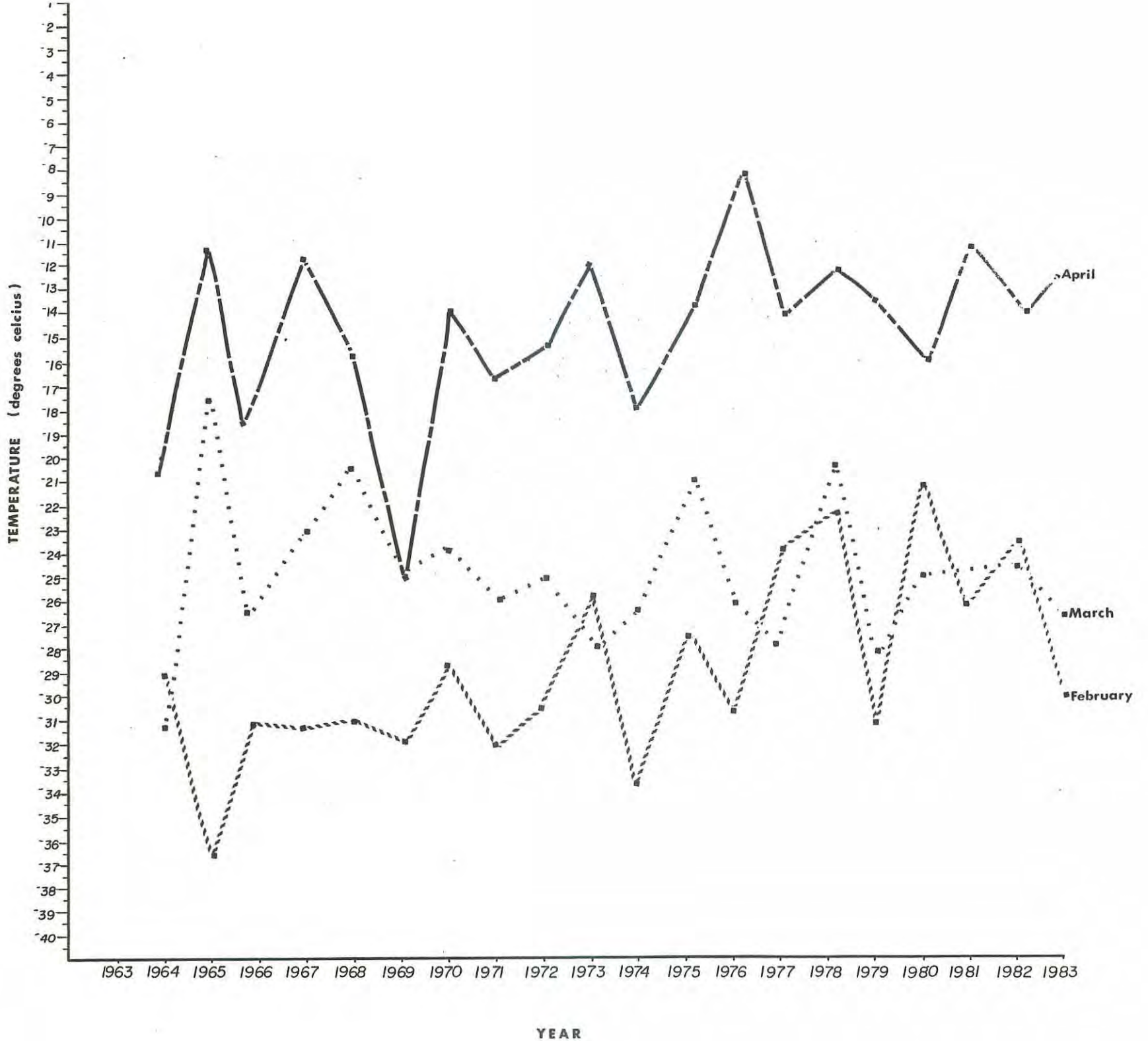
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