WINTER BISON MOVEMENTS IN THE MACKENZIE BISON SANCTUARY, 1981

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ABSTRACT

From five surveys of bison (Bison bison athabascae), an apparent movement of over 200 animals from Falaise Lake to Dieppe Lake within a two week span in February 1981 was detected. This may have been caused by severe weather conditions, rather than by human disturbance.

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INTRODUCTION

During January, February and March of 1981, ground and aerial bison surveys were conducted in the Mackenzie Bison Sanctuary by the Northwest Territories Wildlife Service (Fig. 1). They were designed primarily to collect information on productivity, sex and age composition, behavioural responses, and distribution. To be managed most effectively, changes in distribution of these bison must also be understood. Expansion into new range has not been properly documented.

On the 27 February survey of the entire known bison range, Dieppe and Falaise lake basins were shown to contain over 87% of the bison counted. Accordingly, these two lakes were examined for specific movements and possible causes.

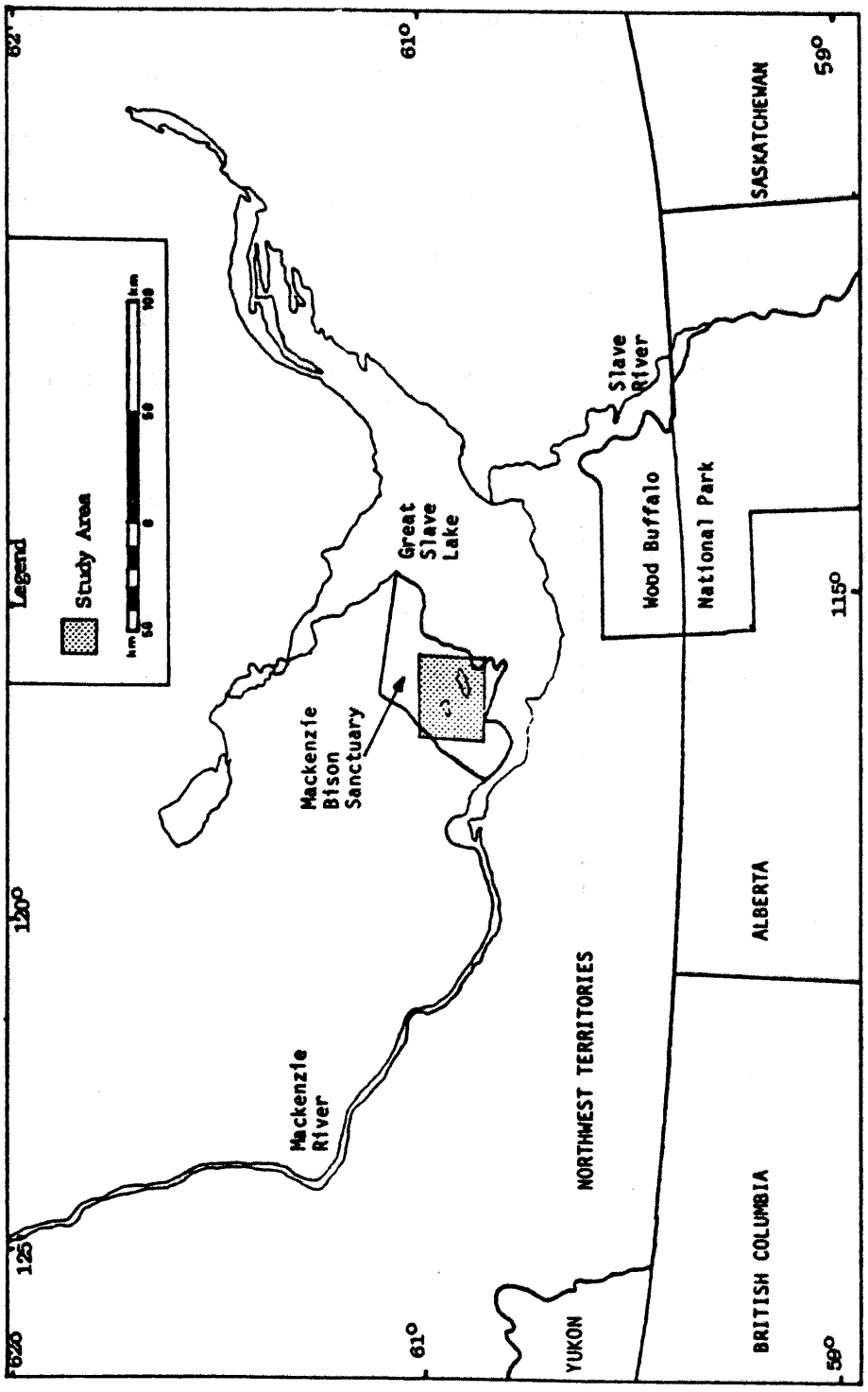

Figure 1. Mackenzie Bison Sanctuary in the Northwest Territories showing study area of winter 1981.

METHODS

Observations on Dieppe and Falaise lakes were extracted from five bison surveys between 29 January and 5 March, 1981. The ground and aerial survey techniques are described by Chowns (1986a, 1986b).

Comparisons of counts during the study period from each lake were made to detect spatial shifts in the population. Weather conditions and human activity were recorded and were examined as possible factors influencing distribution.

RESULTS

Bison observations for each of the surveys are summarized in Table 1. The first was on 29 January in the Dieppe Lake area. The bison observed were concentrated at the eastern and western extremeties of the lake basin. The temperature rose to approximately $-5^{o}C$ and winds were light. Crusted snow, the result of a thaw in mid-January, was evident. Although trappers' snowmobile tracks were visible on every cutline in the vicinity, none were seen on Dieppe Lake.

On 5 February, Dieppe and Falaise lakes were checked from the air. Since the first survey, temperatures were slightly milder and winds were light. On Dieppe Lake, all bison were at the eastern end, and a herd of 35 were 2 km to the southeast. The only snowmobile tracks on the lake were from the 29 January survey. The bison were evenly distributed across Falaise Lake. Beginning in the evening and lasting until 9 February, northwest winds reaching 60 km/h caused drifting snow and, combined with temperatures of $-30^{o}C$, resulted in a severe windchill factor.

A ground survey of Falaise Lake, carried out on 19 February, showed that the bison appeared randomly distributed. The temperature rose to $-17^{o}C$ with gentle breezes. While no snowmobile tracks were found on the lake, an unidentified light aircraft was observed flying low over a herd of 48 bison, which fled into the timber on the south side.

The weather did not change significantly up to the 27 February survey of the entire sancturary. Most of the bison on Dieppe Lake were at the western end, while on Falaise Lake they

Table 1. Bison observations on Dieppe Lake and Falaise Lake in winter 1981.

Date	Survey type	Numbers of bison		
		Dieppe Lake	Falaise Lake	Total
29 January	ground	96	--	--
5 February	aerial	94+35*	450	579
19 February	ground	--	226	--
27 February	aerial	353	229	582
5 March	ground	--	240	--

* Herd of 35, 2 km to the southeast.

were distributed mainly throughout the western and northwestern sections.

When Falaise Lake was surveyed on 5 March, the distribution of bison was similar to 27 February and the weather had not changed appreciably. No other aircraft or new snowmobile tracks were observed.

DISCUSSION

Distribution was not consistent on either Dieppe Lake or Falaise Lake as the bison seemed to be constantly traversing the open areas. In contrast, Jacobson (1974) found all bison and bison sign on the northern sides of the winter feeding meadows. Weather may account for the difference.

It appears that bison numbers remained fairly stable on both lakes except during the period between 5 and 19 February (Table 1). Apparently a massive migration of animals from Falaise Lake occurred at some time during that interval. The results of the 27 February survey suggest that Dieppe Lake received them. Because that event occurred within a two week span, through at least 20 km of forest, and involved over 200 bison, an inducing factor such as weather conditions may have been responsible.

There is evidence to indicate that winter movements may be influenced by weather. Calef (1976) observed, on the Slave River lowlands, that an autumn snowstorm followed by freezing rain drove the bison into a wintering area farther south than usual. Fuller (1966) reported that extreme cold, even with a moderate wind 13-16 km/h (8-10 mph), sent bison in Wood Buffalo National Park to the shelter of the timber. The period of severe windchill in this study occurred within the time period that the apparent movement took place. If the bison had reacted by proceeding northwesterly into the timber, they would have eventually reached Dieppe Lake.

It is less likely that the movement was caused by human disturbance, although Calef (1976) recorded that it can affect

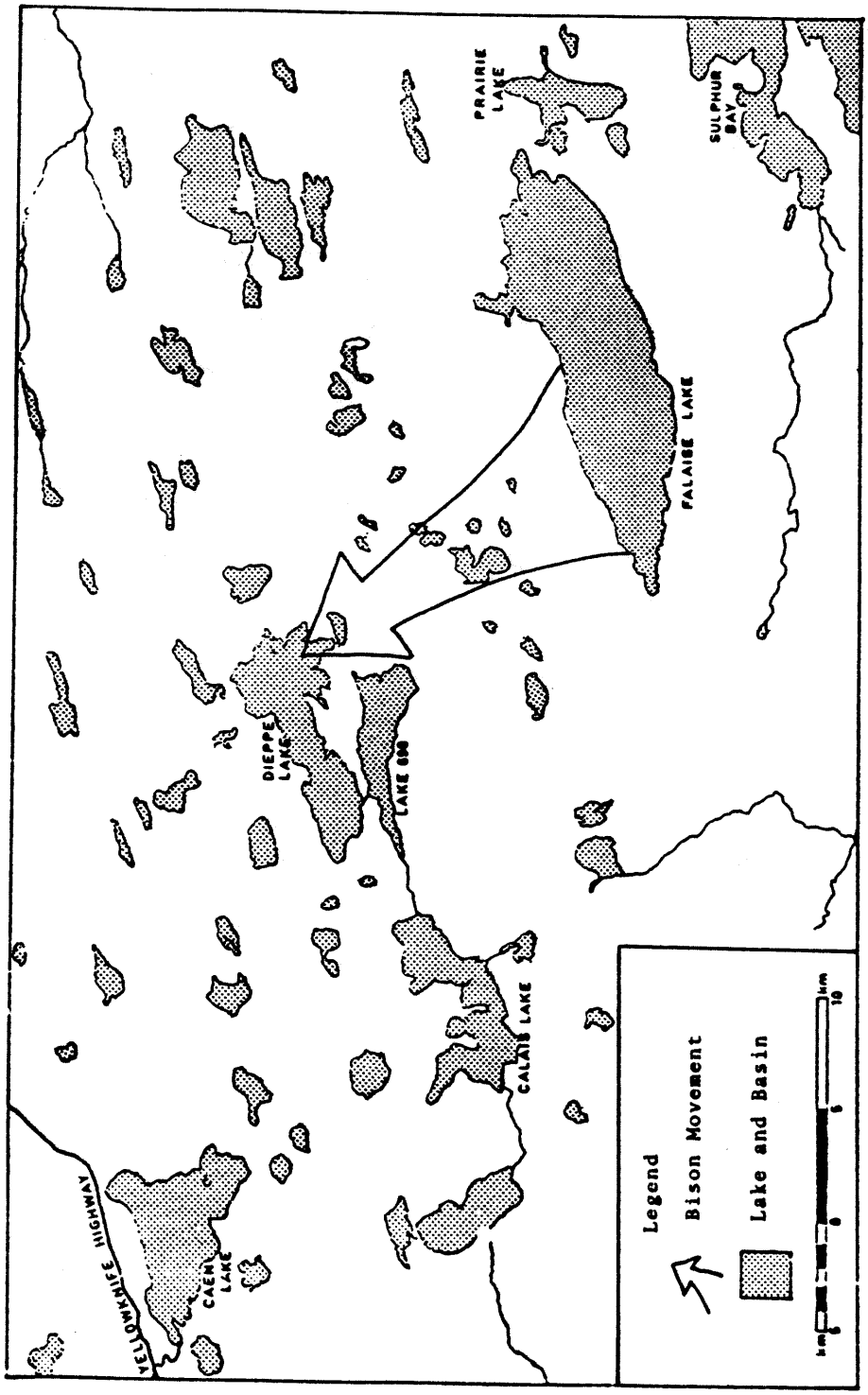

Figure 2. Direction of apparent bison movement in late February 1981 from Falaise Lake to Dieppe Lake.

movements at any time of the year. There was no evidence that bison were harassed by snowmobiles. Although one instance of aircraft harassment was noted, its potential impact on bison movements is difficult to assess. The Sanctuary is situated within the triangle formed by the communities of Yellowknife, Fort Simpson, and Hay River making it extremely vulnerable therefore, to the large number of light aircraft originating from those places. The only way to rule out aircraft disturbance in future as a possible cause for large scale movements it to provide a regulation under the Wildlife Act that would establish a minimum altitude, except under special permit for flights over the Sanctuary.

To acquire a better knowledge of changes in distribution, the bison should be monitored monthly, or at selected times of the year such as after severe weather conditions, calving time and the rut, in addition to the annual late winter survey.

ACKNOWLEDGEMENTS

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