MOOSE POPULATION RESEARCH AND MANAGEMENT STUDIES IN YUKON

MOOSE POPULATION SURVEYS IN THE MOOSEHORN RANGE AREA 1989 - 1990

by

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Introduction

Continued high mineral prices, attractive tax credits and grants during the last decade have lead to a boom in exploration and mine development in Yukon. Associated with this exploration and development is the proliferation of roads and airstrips throughout the territory. The impacts of this increased access on wildlife populations are largely unknown but increased access, unless carefully regulated, can lead to declines in local wildlife populations.

One area currently experiencing an increase in access is the Moosehorn Range area on the Yukon-Alaska border. Exploration and development have lead to a road and several airstrips being constructed in this previously remote area. As part of the Resource Transportation Access program, money became available to survey the moose population in this area. The objectives were to: 1) assess current moose population levels, 2) identify moose concentration areas and 3) attempt to predict the potential impacts of mining related access development on the local moose population. The following report summarizes the results of late fall and late winter moose surveys in the area aimed at achieving the above objectives.

Study Area

The study area encompasses 785 km^2 around the Moosehorn Mountain Range in southwestern Yukon (Figure 1). It is bounded by the Ladue River on the north, Scottie Creek and Seven Mile Creek on the south, the White River on the east, and the Alaska-Yukon border on the west.

The area lies within the Wellesley Lake ecoregion (Oswald and Senyk, 1977). The northern part of the area is typified by weathered mountains rising to 1,600 meters dissected by numerous creek drainages. Open black spruce/sphagnum bogs and fens are common in the southern part of the area.

The climate in the area is continental with extreme seasonal temperature fluctuations (Wahl et al. 1987). Mean annual snow accumulation is 40 cim (Anon, 1989). Total annual precipitation averages about 320 mm.

Methods

Methods used for these surveys are the same as those used for stratification surveys as described by Gasaway et al. 1986. Briefly, stratification surveys are done using a fixed wing aircraft with two observers, a navigator, and the pilot. The survey is flown 60 to 120 meters above ground level at about 125 kmph. Search intensity is normally about 0.3 - 0.5 minutes/km^2.

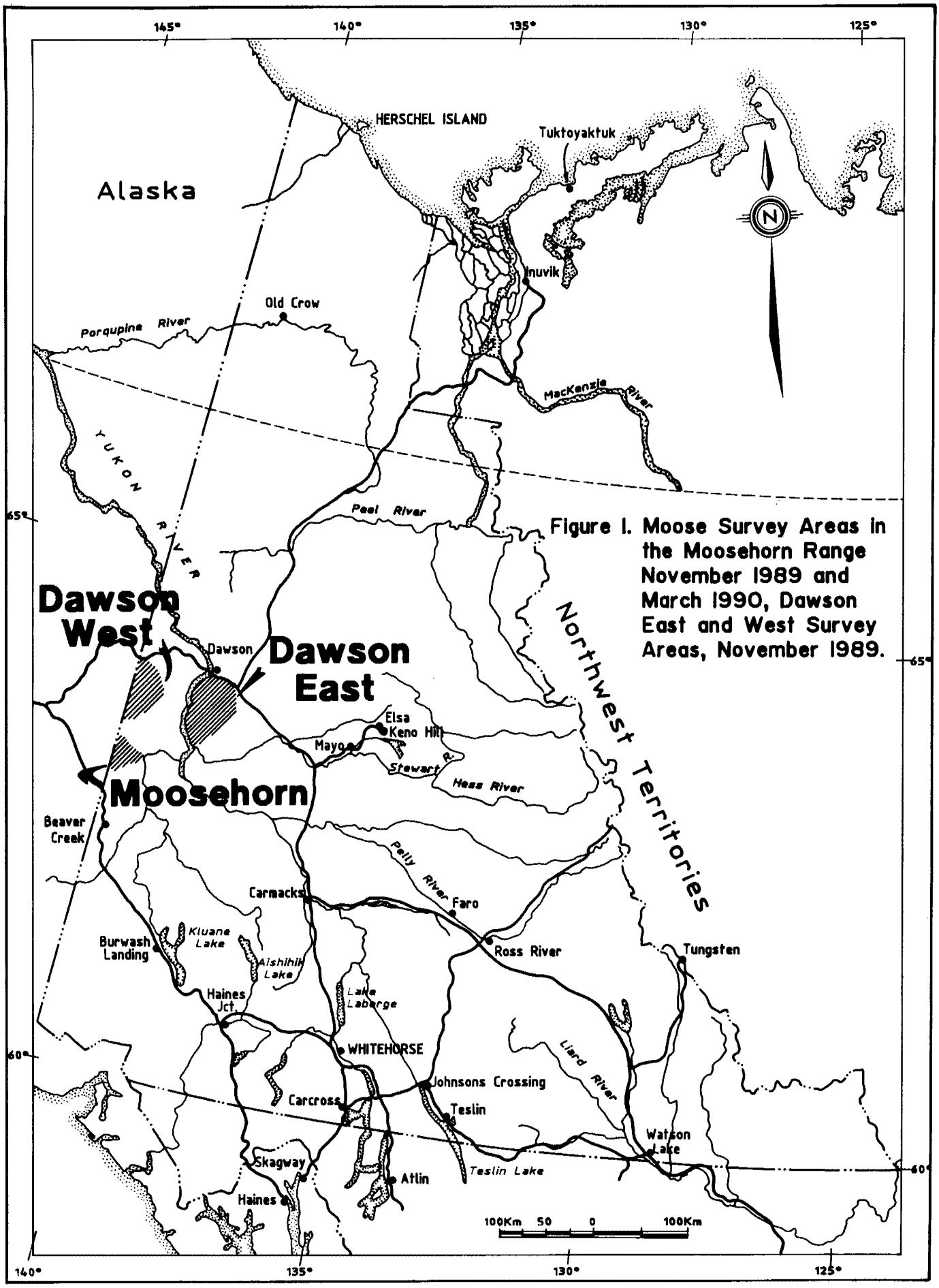

Figure I. Moose Survey Areas in the Moosehorn Range November 1989 and March 1990, Dawson East and West Survey Areas, November 1989.

Flightlines are layed out to provide complete survey coverage of the area. The intent of stratification surveys is to quickly assess relative moose abundance and distribution within the survey area. The technique is not designed to provide estimates of absolute moose abundance.

Two surveys were carried out in the Moosehorn survey area, one in November 1989 and the other in March 1990. The results are compared to the more intensive surveys which were flown in the Dawson area (Figure 1) during the fall of 1989. The purpose of this comparison was to get an overview of regional moose distribution and to guestimate the actual moose density in the Moosehorn range. This comparison is appropriate because survey techniques, terrain, climate, and vegetation is similar in the two areas. A summary of survey expenses is presented in appendix 1.

Results and Discussion

Survey intensities during the late fall and winter surveys in the Moosehorn range area were 0.31 and 0.44 minutes/km^2 respectively (Table 1). These values are similar to the 0.43 minutes/km^2 used to stratify the Dawson West area (Larsen and Ward, in prep.) but they are considerably less than the 0.66 minutes/km^2 used to stratify the Dawson East area (Table 1). It is not possible to quantify the effect of the differences in search intensity on the number of moose seen but it is generally agreed that the proportion of moose observed increases with increased search intensity (Gasaway et al. 1986). Search intensity for the two

Table 1. Summary of Moosehorn Range and Dawson Area Moose Surveys

Date/Area	Area (km^2)	Survey Time (min)	Survey Intensity (min/km^2)	Total Moose Observed	Moose seen per survey minute	Adults observed	Calves observed	Percent Calves	Observed Moose density ($moose/1000km^2$)
Moosehorn Nov. 1989	785.2	240	0.31	71	0.30	57	14	19.7	90.4
Moosehorn March 1990	785.2	347	0.44	27	0.08	23	4	14.8	34.4
Dawson East October 1989	2611	1702	0.66	318[1]	0.19[1]	276[1]	42[1]	13.2	121.8
Dawson West Nov. 1989	1870	799	0.43	185[1]	0.23[1]	112[1]	22[1]	11.9	98.9

[1] Moose observed during stratification flights

Moosehorn area surveys and the Dawson West surveys are similar so that the results should be comparable.

A total of 71 moose were observed in the Moosehorn survey area during the late fall survey 9Table 1). This corresponds to 0.30 moose observed per survey minute or an observed density of 90.4 moose/1,000 km^2. We believe this underestimates the true density of moose because not all moose are observed during stratification flights. Calves comprised 19.7% of moose observed. Most moose were concentrated in subalpine willow zones (Figure 2) at elevations between 760 and 1,220 meters ASL. This post rut distribution of moose in subalpine areas is similar to that observed in other areas of the Yukon.

Moose seen presurvey minute and the observed moose density in the Moosehorn area were similar to those in the Dawson West area when surveyed during late fall, 1989 (Larsen and Ware in prep.). Moose seen presurvey minute and observed moose density during the Dawson West stratification flights were 0.23 moose/minute and 98.9 moose/1,000 km^2 respectively. Intensive survey of the Dawson West area resulted in an estimated density of 168 moose/1,000 km^2, similar to Yukon wide average of 160 moose/1,000 km^2 (Larsen and Ward in prep.). Based on these results, it is likely that the Moosehorn area also has a moose density of approximately 160 moose/1,000 km^2.

Observed moose density in the Moosehorn area was substantially lower during the late winter survey than the fall survey. Only 27

moose (0.08 moose/survey minute) were seen in the Moosehorn area during the late winter survey. This represents an observed density of 34.4 moose/1,000 km^2. Percent calves in the population during the late winter survey also declined slightly to 14.8%. This percentage of calves indicates good over-winter survival and is suggestive of a stable moose population. The observed moose were more widely distributed at lower elevations (<760 meters) during the late winter survey.

The apparent decline in the number of moose seen between the late fall and late winter surveys may be a function of several factors. In moving down from the subalpine shrub zones, moose entered denser coniferous cover where sightability and therefore the proportion of moose seen tends to be reduced. Also, in moving down to lower elevations many moose would be expected to leave the survey area. These results suggest that the Moosehorn survey area is not a significant late-winter range for moose.

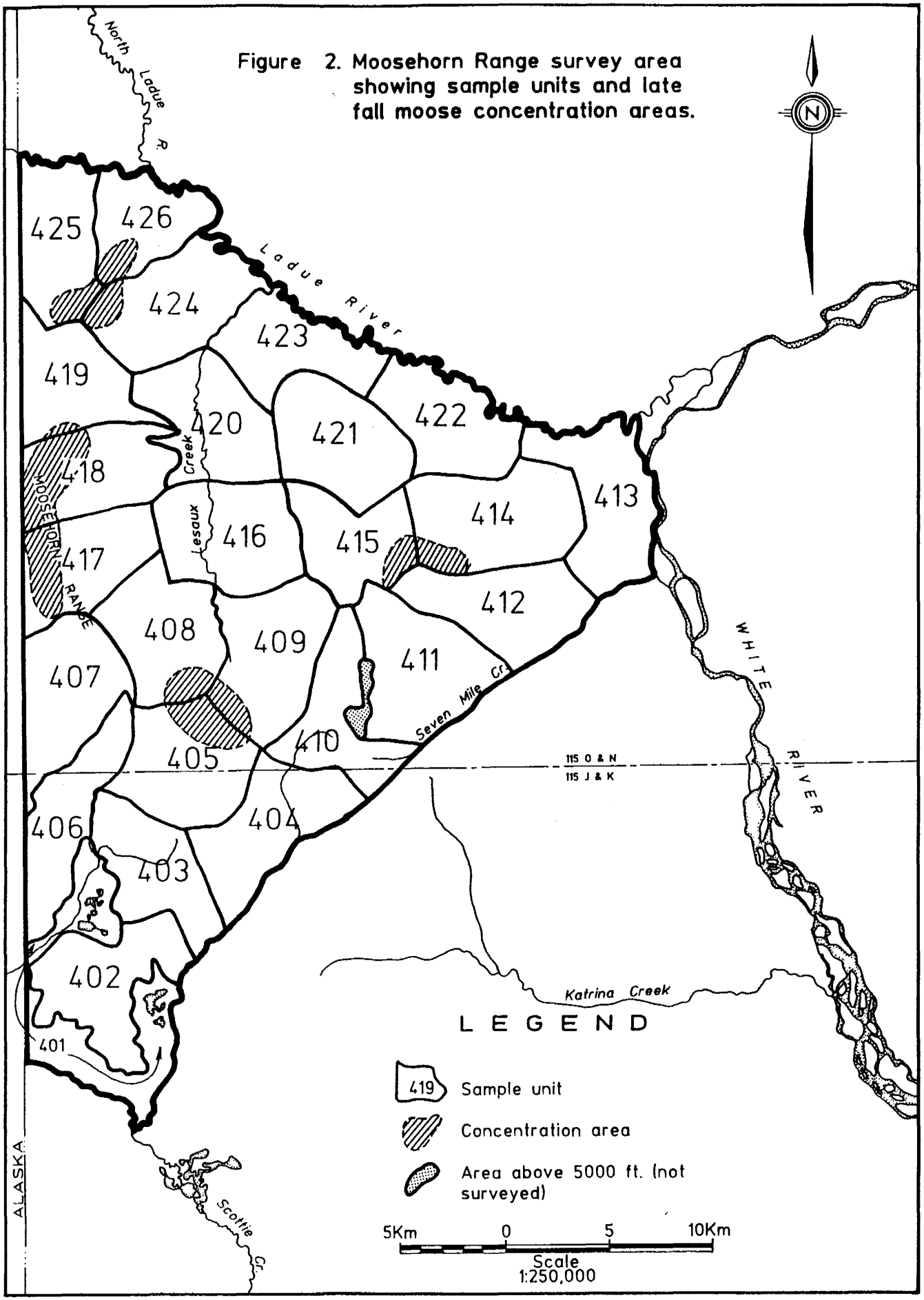

Figure 2. Moosehorn Range survey area showing sample units and late fall moose concentration areas.

Potential Mining Impacts

The limited data collected during these surveys are insufficient to state what the impacts of increased access and mining activity in the Moosehorn Range area will be. Some general comments on the potential impacts are as follows. It is unlikely that direct habitat loss would have a significant impact on the local population unless the operation is extensive. The most likely negative impacts are related to increased access into the area and displacement of moose from seasonal concentration areas due to harassment.

Increased access into the area with the construction of roads and airstrips may result in an increased harvest. This may not have a significant negative impact on the population if the harvest pressure remains low. Increased harvest might exceed the sustainable limits, however, and lead to a decline in the population.

Mining activities and related harassment may also lead to the displacement of moose from critical areas. Our late fall surveys indicated that moose aggregated in the subalpine areas between 760 and 1220 meters ASL. The operation of heavy equipment and other mining activities in these areas could result in the displacement of moose. The impact of displacement on the local moose population is unknown. No similar aggregation areas were identified during our late winter survey.

Acknowledgements

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Appendix 1. SUMMARY OF MOOSEHORN SURVEY EXPENSES

Fall survey			
Travel to Dawson	960 km @ $0.26/km		$ 249.60
Accommodation	4 rooms for 4 nights @ $50/night/room		800.00
Meals	5 days for 4 persons @ $38/person/day		760.00
Personnel	2 casuals for 5 days @ $112.50/ person/day		1,125.00
Fuel drop and pickup	130 each x 2		260.00
Fuel			561.20
Aircraft positioning from Teslin	$690 each way x 2		1,380.00
Aircraft			1,380.00
		SUBTOTAL:	$6,515.80
Spring Survey			
Meals	4 persons for 1 day @ $38/person/day		$ 152.00
Fuel drop and pickup	$130 each x 2		260.00
Fuel			561.00
Personnel	1 casual for 1 day		112.50
Maps			50.00
Air charter			2,811.00
		SUBTOTAL:	$3,946.00
		TOTAL:	$10,462.50