1999 M'CLINTOCK MOOSE SURVEY RESULTS SUMMARY

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1999 M'Clintock Moose Survey Results Summary

We conducted a moose survey in the M'Clintock River area in November-December 1999. The area extends between the Teslin and M'Clintock rivers and from Jakes Corner north to Teslin Crossing. It encompasses Game Management Subzones (GMS) 8-12 and 8-15 to 8-17 (see attached map). It covers a total area of 3555 square kilometers, of which approximately 3332 square kilometers (1287 square miles) is habitable moose range.

Historically, much of this area has been quite remote and inaccessible. Local knowledge suggests, however, that with increased access and the proliferation of All Terrain Vehicles (ATVs), in combination with hunting restrictions south of Whitehorse, moose hunting pressure has been increasing in recent years. We have no past survey information on moose in the M'Clintock area, so harvest records provide our only means of assessing the impact this increased hunting pressure has had on moose abundance and distribution. This survey was done to collect baseline information on current moose abundance and distribution in the M'Clintock River area. The information will be used to monitor future changes in the moose population, and in the development of management plans for the area.

We used a modified version of our stratified random block survey method to count moose in an area. A description of our standard method for counting moose is presented in the Yukon Government publication entitled "Yukon Moose". To receive a copy of this publication contact your local Department of Renewable Resources Field Services Office or the Department of Renewable Resources Moose Management Unit at 10 Burns Road, Whitehorse; or phone (867) 667-5787.

Modifications made to our standard survey technique in 1999 included using fixed-wing aircraft instead of helicopters for our initial count of moose in selected survey units. We used helicopters to re-fly a portion of these units to determine how many moose were missed by the fixed-wing aircraft. The results of this second search were used to develop a Sightability Correction Factor (SCF) which was applied to our initial population estimate to account for missed moose. The survey area was divided in approximately 16 square kilometer blocks using a latitude and longitude grid. Each block was assigned a generalized habitat description compiled from vegetation maps, forest cover maps, fire history data, and satellite imagery. Global Positioning Systems (GPS) were used to navigate each unit and to determine the location of each moose group observed.

Unusually poor flying weather in November and December 1999 resulted in the survey stretching over a month instead of the 9-11 days expected. Although some downward movement of moose from the alpine areas was observed towards the end of the survey, the relatively warm temperatures and moderate snowfall prevented major movements of moose during this time.

We estimate that there are 873 ± 189 moose in the M'Clintock survey area, for an average density of 262 moose for every 1000 square kilometers (see Table 1). This is somewhat higher than surrounding areas surveyed to date. In the Big Salmon survey area, directly to the north, we estimated about 195 moose per 1000 square kilometers in 1998. Estimated moose density in the Nisutlin area, to the east, was 235 moose per 1000 square kilometers in 1994. Moose densities in the Carcross (1994) and Rose Lake survey areas (1995), south of the Alaska Highway, were even lower (127 and 159 moose per 1000 square kilometers respectively). The average moose density calculated for 26 areas censused to date throughout the Yukon is 205 moose per 1000 square kilometers.

Of the estimated 873 moose in the area, 347 were mature cows, 249 were mature bulls (72 for every 100 mature cows), 152 were yearlings (44 for every 100 mature cows), and 121 were calves (35 for every 100 mature cows). Five percent of the cows observed with calves had twins. Despite the relatively low twinning rate, the overall proportion of calves and yearlings in the population is indicative of a stable to increasing moose population.

As in most early winter surveys, the majority of moose observed were associated with sub-alpine shrub habitats in mountainous regions at or above 3500 ft. Sub-alpine shrub habitats represented only 32 percent of the area searched during the census, but contained 66 percent of the moose counted. These habitats generally have abundant willows and provide good browsing areas during the post-rut period. The highest numbers of moose occurred in the northern half of the survey area, in the Mt. Byng and Mt. M'Clintock areas, and in the vicinity of Joe and Teslin mountains. Moose numbers in the southern portion, where local knowledge suggests hunting pressure has increased in recent years, were substantially lower.

Based on our current population estimate, and a 3% to 4% allowable harvest rate, the M'Clintock survey area can probably sustain a harvest of about 26 to 35 moose per year. Between 1994 and 1998, the five-year average reported harvest by residents and non-residents was about 19 moose per year (see Figure 1). Residents were responsible for all but one of the moose harvested between 1994 and 1998. These numbers do not, however, include harvest by First Nations.

Information on the moose harvest patterns by First Nations in this area is limited. Participation of local First Nations in a native harvest survey that was conducted between 1987 and 1991 was intermittent, and the average native harvest of three moose per year over this five-year period is considered an under-estimate. If we assume the First Nation harvest is similar to the resident harvest, the total harvest would be at or above the sustainable limit.

Distribution of harvest in the survey area has shifted over the last two decades. Prior to the mid 1980s, access was limited to areas adjacent to the Alaska Highway and Teslin River, and a few trails running into GMS 8-16 and 8-17 (see attached map). Between 1981 and 1985, an average of 17 moose per year (77% of the total five-year reported harvest in the survey area) were taken in these two subzones. Only four moose per year

(18% of the total survey area harvest) occurred in GMS 8-15 (around Mt Byng) and one moose per year was taken in GMS 8-12. In 1986-87 an exploration trail was pushed over Mt Byng bisecting GMS 8-15. Between 1994 and 1998, the reported harvest in GMS 8-15 increased to an average of 7 moose per year (37% of the total reported moose harvest). At the same time the harvest in GMS 8-16 and 8-17 declined to about 10 moose per year (56% of the total reported harvest), possibly as a result of declining moose abundance. Harvest in the still remote northern section of the survey area (GMS 8-12) remains low, averaging 1 to 2 moose per year between 1994 and 1998.

In summary, overall moose abundance in the M'Clintock area is above the Yukon average and higher than surrounding areas surveyed to date. Population composition is within the range normally associated with stable to increasing moose populations. The reported moose harvest is currently within sustainable limits, but we do not know how many moose First Nation members' harvest in the area each year. Increased access, shifting harvest patterns, and the possibility that moose abundance has declined in the southern portion of the survey area creates some concern for the long-term welfare of this population.

In addition to moose, we recorded a number of other species during the survey. A total of 411 caribou were observed throughout the study area. Lone wolves were seen near Michie Lake, Joe Mountain, and Judas Creek; and a pack of 8 wolves was located west of Mary Lake. One blue grouse was recorded west of Mt. M'Clintock, and a black bear (possibly with a cub) was observed southeast of Mt. M'Clintock near the Mary River.

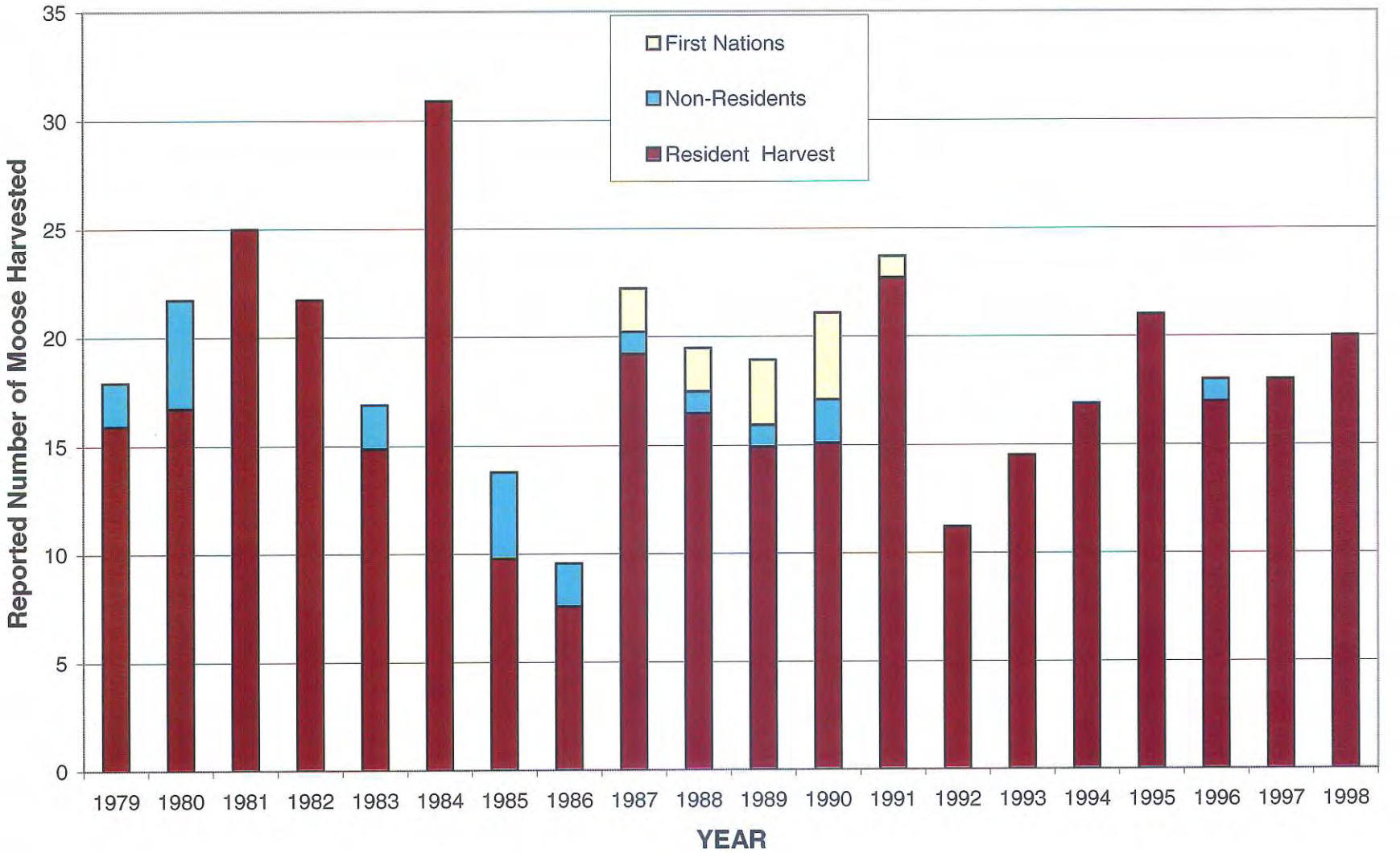
A final thanks to the Kwanlin Dun First Nation and Ta'an Kwach'an Council for selecting local observers to assist with the survey. The patience and endurance of the observers over the extended survey period was much appreciated.

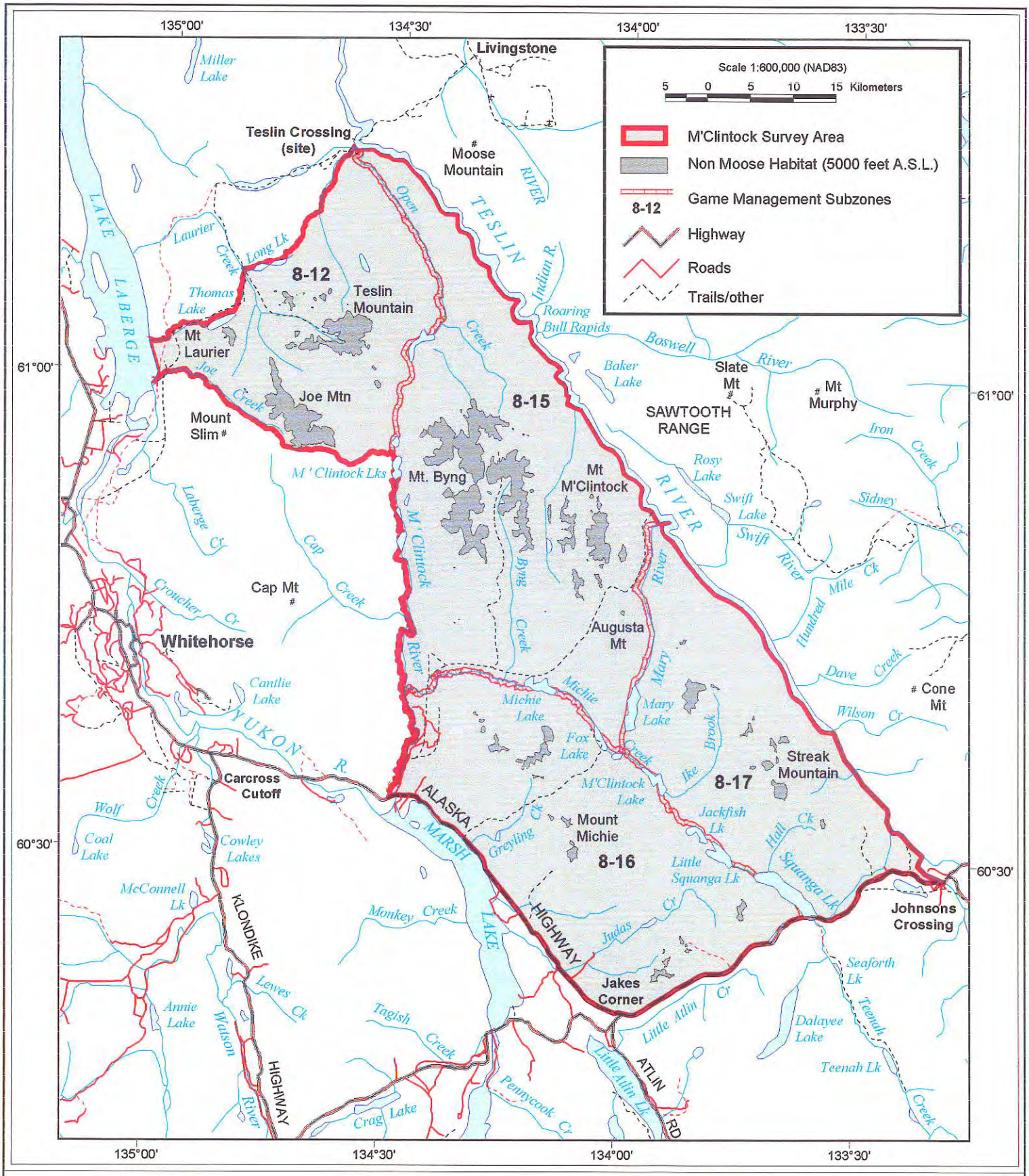
Table 1: Summary of 1999 M'Clintock Area Moose Survey Results

POPULATION CHARACTERISTICS	1999[1]
Estimated Abundance	
Total Moose (90% Confidence Interval)	873 (684 – 1063 moose)
Density (Moose per Km^2)	262
Estimated Composition	
Mature Bulls (≥ 30 months)	249 (173 - 325)
Mature Cows (≥ 30 months)	347 (245 - 450)
Yearlings (Approx. 18 months)	152 (54 - 251)
Calves	121 (75 - 167)
Unknown age/sex	4 (1 – 7)
Estimated Ratios	
Mature Bulls per 100 Mature Cows	72
Yearlings per 100 Mature Cows	44
Calves per 100 Mature Cows	35
Mature Bulls: % of Total Population	29 %
Mature Cows: % of Total Population	40 %
Yearlings: % of Total Population	17 %
Calves: % of Total Population	14 %
Unknown: % of Total Population	<1 %
Twinning Rate	5 %
SURVEY CHARACTERISTICS	
Stratification	
Survey Dates	Nov. 12-21, 29
Area searched (Km^2)	3332
Time used in search (minutes)	1935
Search Intensity (min. per Km^2)	0.58
Moose seen	471
Moose seen per minute	0.24
Census	
Survey Dates	Nov. 23-Dec. 10
Area Searched (Km^2)	884.8
Percentage of total area searched	27 %
Time used in search (minutes)	1856
Search Intensity (minutes per Km^2)	2.1
Moose seen	301
Moose seen per minute	0.16

1. Pooled Sightability Correction Factor of 1.10 incorporated in population estimates (Calculated SCF for High Stratum = 1.20; Medium Stratum = 0.97; Low Stratum = 1.04)

Figure 1. Reported Moose Harvest in the M'Clintock Survey Area (Game Management Subzones 8-12, and 8-15 to 8-17)





M'Clintock Moose Survey Area, 1999