

1995 WATSON LAKE MOOSE SURVEY SUMMARY



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Yukon Department of Environment
Fish and Wildlife Branch, V-5A
Box 2703, Whitehorse, Yukon Y1A 2C6
Phone (867) 667-5721, Fax (867) 393-6263
E-mail: environmentyukon@gov.yk.ca

Also available online at www.env.gov.yk.ca

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Approximately 4380 Km² of habitable moose range in the Liard River Basin adjacent to Watson Lake were surveyed for moose during late November and early December 1995. The survey area extended from the eastern edge of the Liard River floodplain west to the Cassiar Mountains and from the BC/Yukon border north to Cabin Creek. The area west of the Liard River was previously surveyed in 1983. The narrow band of floodplain along the eastern shore of the Liard River had been previously surveyed as part of a larger area in 1986.

The primary purpose of the survey was to assess moose population abundance, composition, and distribution. These data were compared to the results of the previous survey conducted in 1983 to assess population trends and the impact of historic harvest levels on the population. In addition, we used this opportunity to assess the potential for using habitat types to stratify survey sample units. The results of this latter assessment will be presented in a later summary.

The results of the 1983 and 1995 surveys of the area are summarized in Table 1. The 1995 survey area moose population is estimated to be 799 moose (90% C.I. – 657-941). A pooled sightability correction factor (SCF) of 1.096 is incorporated into this population estimate to allow for moose missed during the initial census. This population estimate translates to an average density for the area of 182 moose/1000 Km². This density is similar to the average value (185 moose/1000 Km²) calculated for other areas censused to date throughout Yukon.

Study area size and location differences between the 1983 survey (7217 km²) and the 1995 survey (4380 km²), necessitated subsetting the 1983 and 1995 data to cover an area of overlap slightly smaller than the 1995 area. The 1983 and 1995 results were recompiled and reanalyzed for the comparable area surveyed between the two years (Table 1).

It is not possible to compare the 1995 population estimate directly with that calculated from previous survey results because prior to 1989 no SCF was developed and incorporated into the population estimates. Between year comparisons are therefore made with no SCF incorporated into the 1995 population estimate. Population estimates with no SCF incorporated are 370 (266-474) and 712 (604-820) (90% C.I.'s) for the comparable area surveyed in 1983 and 1995 respectively. This represents a significant increase in the moose population between the two survey years (Two-tailed T Test; P>0.05).

There were also changes in the composition of the moose population in the comparable area surveyed from 1983 to 1995. Adult bulls per 100 cows have declined by a quarter (61 to 46). However, while decreasing, the 1995 levels are still within our management guidelines where a ratio of 30 bulls per 100 reproductive cows is considered a sufficient number to ensure maximum reproductive potential. Yearlings and calf numbers increased four-fold from 8 to 32 yearlings per 100 cows, and 11 to 46 calves per 100 cows. This trend holds true with the data from the larger area of 1983 as well, except the decrease in the bull to adult cow ratio is somewhat greater (71 to 46) and the increase in yearlings and calves was only two-fold. Late winter population composition surveys in March 1996 also indicate an above average

proportion of calves in the population. Recruitment indicators are good and suggest a healthy, stable and possibly increasing population.

The average annual reported harvest in the four and a half (10-28 is only half in the survey area and the harvest is assumed to be equally distributed in the subzone, 10-27, 10-30, 10-31 and 10-32) Game Management Subzones encompassed by the survey area west of the Liard River appears to be stable since harvest data began to be kept in 1979 (Figure 1). Although there appears to be large yearly fluctuations, the variation from the mean is not significant. Harvest by non-First Nations in the area has remained stable with an average of 12.2 moose per year. The non-resident component of this harvest is 0.3 moose per year. We only have reported harvest by First Nations from the years 1987-1991 and their average for these years is 9.8 moose. If we assume the harvest by First Nations has also remained stable since 1979, then we can estimate a minimum annual harvest for the area of 22 moose. This is probably an underestimate as not all First Nations participated in the harvest reporting program and their harvest is generally considered to be equal to the non-First Nations harvest. Assuming equal harvest the estimated annual harvest would be 25 moose.

An annual harvest of 22 moose represents 2.8% of the current population estimate and 3.1% of the comparable area estimate from 1983. A majority of this harvest (90%) occurs in the three and a half subzones (half of 10-28, 10-30, 10-31 and 10-32) along the Alaska Highway.

Differences in weather between survey years increases the difficulty in comparing the 1983 and 1995 population estimates. There is evidence (radio tracking and observations) that the Liard Basin moose have seasonal movements into and out of the surrounding mountains in the summer and fall, with the primary winter range being in the Basin. Snow depth is thought to be the factor responsible for the timing and initiation of these movements. The long-term snow depth normals for Watson Lake in the months of October, November and December are 7, 24 and 42cms respectively. In October, November and December of 1983 these values were 3, 16 and 19cms respectively, which is well below normal. In 1995 they were 3, 39 and 49cms, or above normal, especially for the month of November. Due to the differences in snow depth between the surveys it may be reasonable to compare the population of the larger area in 1983 with the 1995 area. If in 1983 the moose movement back into the basin was later than usual, and in 1995 it was earlier than usual, then the two areas may have contained similar populations, with the larger area in 1983 just including all of the moose that had not yet moved into the basin due to the low snow depth and resulting ease of movement in the higher elevations. Thus, between the years you have a similar population estimate, with the lower density in 1983 being a result of the same population in a larger area of the range – or less concentrated. If this is the case, the population size has virtually remained unchanged, with the only changes being in the composition. This assumption is untested, and may be inaccurate as we do not know that all of the moose in the western portion of the area in 1983, and even in 1995, do not winter in the Rancheria area or other areas to the west or north; or how much movement there is into and out of the basin from the east.

Table 1: Summary of Watson Lake survey area early winter moose census results from 1983 and 1995.

POPULATION CHARACTERISTICS	1983 Total Area ¹	1983 Comparable Area ^{1,2}	1995 Comparable Area ^{1,3}	1995 Total Area
Estimated Abundance (90% C.I.)				
Total Moose				799 (657-941) ⁴
Density (moose/1,000km ²)	829 (651-1006)	370 (266-474)	712 (604-820)	729 (619-838) ¹
	115	88	166	182 ⁴ 166 ¹
Estimated Ratios				
Adult Bulls/100 Adult Cows	71 (46-96)	61 (40-81)	46 (33-59)	44 (32-57)
Yearlings/100 Adult Cows	18 (3-34)	8 (0-18)	32 (12-52)	33 (13-53)
Calves/100 Adult Cows	18 (9-26)	11 (2-20)	46 (36-56)	46 (36-56)
% Adult Bulls in Total Population	34 (26-42)	34 (26-42)	20 (16-24)	20 (16-24)
% Adult Cows in Total Population	48 (40-56)	56 (48-63)	45 (38-52)	45 (38-52)
% Yearlings in Total Population	9 (2-15)	4 (0-10)	14 (7-21)	15 (8-22)
% Calves in Total Population	8 (5-12)	6 (2-11)	21 (18-24)	21 (18-24)
Estimated Twinning Rate	N/A ⁵	N/A ⁵	6%	6%
Observed Twinning Rate	12%	12%	8%	8%
SURVEY CHARACTERISTICS				
Stratification				
Area (km ²)	7217	4217	4283	4380
Time (Minutes)	1752	N/A ⁵	N/A ⁵	2219
Search Intensity (min./km ²)	0.24	N/A ⁵	N/A ⁵	0.51
Moose Seen	449	218	295	306
Moose Seen/min.	0.26	N/A ⁵	N/A ⁵	0.14
Dates	Nov. 22-30	Nov. 22-30	Nov 28-Dec 3	Nov 28-Dec 3
Census				
Area (km ²)	1302	716	1279	1298
% of Survey Area Searched	18.0%	17.0%	29.8%	29.6%
Time (Minutes)	1966	977	2581	2617
Search Intensity (min./km ²)	1.5	1.4	2.0	2.0
Moose Seen	304	131	296	304
Moose Seen/min.	0.15	0.13	0.11	0.12
Dates	Nov 30-Dec 3	Nov 30-Dec 3	Dec. 4-14	Dec. 4-14

¹ No Sightability Correction Factor (SCF) incorporated

² This is a subset of the 1983 data that overlaps with the 1995 area

³ This is a subset of the 1995 data that overlaps with the 1983 area

⁴ A Sightability Correction Factor (SCF) of 1.096 is incorporated

⁵ N/A = Not Available

Figure 1: Reported Harvest in Watson Lake Moose Survey Area

