

2009 WMU 509 Moose

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Moose are an important ungulate found throughout most of the northern boreal forest, as well as in agricultural areas along the boreal/parkland “fringe” where there are few predators and abundant food sources (Arsenault 2000; Rippin 2001). They are well-adapted to areas with cold winter temperatures and heavy snowfall, although moose in Northeast Alberta typically occur at low population densities (Lynch 1999) and sympatrically exist with other ungulate species including white-tailed deer, mule deer, elk, and woodland caribou. Moose are a key biological component of boreal ecosystems (Rippin 2001), are an important prey species for generalist predators such as wolf and black bear, and are highly valued as a big game species by aboriginal, resident, and non-resident hunters. They are also aesthetically appealing to the public as “watchable wildlife”, although vehicle-animal collisions may be frequent where human and moose densities are high. Moose are one of the main species of ungulates managed by wildlife biologists in Alberta, and a thorough understanding of their population dynamics, distribution, and movements is required.

The purpose of this report is to present the results of the 2009 wildlife survey of WMU 509. Specifically, this survey was designed to obtain population statistics on local moose populations.

Study Area

WMU 509 is relatively diverse in its habitat and landforms, being situated on the transition zone between agricultural lands and northern boreal mixed-wood forest (Figure 6.11.1). It is bordered by Calling Lake in the north and the town of Athabasca in the south. The Athabasca River traverses the west side of the WMU and turns northward to divide the area into two halves; numerous drainages and watercourses from this main river system branch throughout the WMU. In the northern portion of

the WMU large expanses of mixed wood forest are interspersed with treed and open fens. In the south much of the forested area has been cleared for agriculture. Agriculture is the main human activity in WMU 509 including a number of hybrid aspen tree farms, although timber harvest and oil and gas activities occur throughout the forested crown lands.

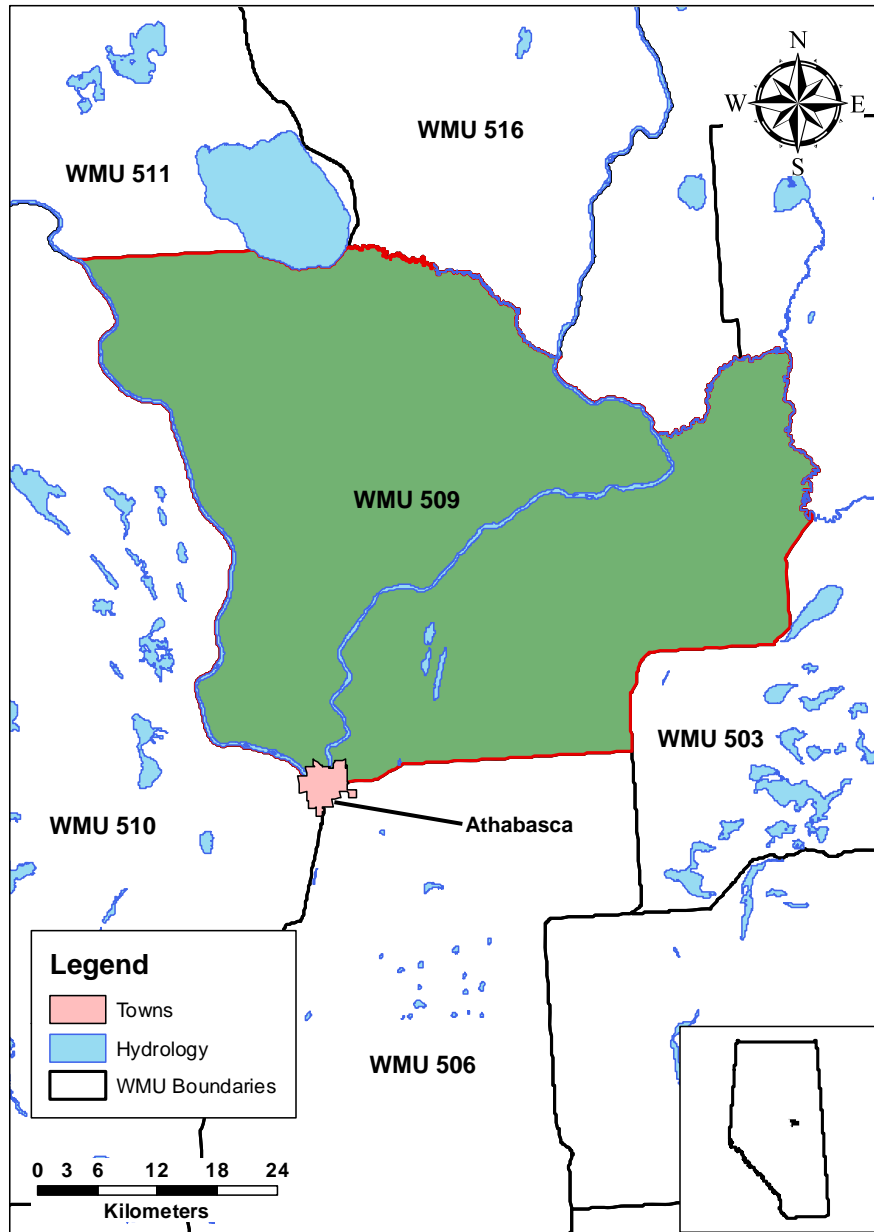


Figure 6.11.1. Location of WMU 509 in Alberta.

Survey Methods

The study area was initially stratified for moose densities (Gasaway et al. 1986) using a fixed-wing aircraft (Cessna 206), from December 10-13, 2008. Three observers, including a crew leader/navigator in the front passenger seat, were used during stratification. Air speed during the stratification was approximately 150 km/h and altitude above ground was approximately 100 m. Height and speed of the aircraft changed slightly with the amount of tree cover and sighting conditions. The stratification lines were 1 minute of latitude (1.6 km) apart and observers were able to note the individuals seen within 250 m for each side of the aircraft. Although the stratification lines were flown across the entire WMU, some individuals were probably missed due to the distance between lines. However, the intent of the stratification was to determine whether moose numbers were low, medium, or high within each sampling block (5 minutes latitude x 5 minutes longitude in size) situated in a grid across the entire WMU (Glasgow 2000). Approximately 20% of the blocks were classified into each of the low and high categories.

Nine sampling blocks (3 per stratum) were randomly selected from the grid and were intensively searched by helicopter (Bell 206L) on December 15th and 17-19. Sampling blocks were surveyed at 100 km/h and approximately 60 m above ground level. Three observers, including the crew leader/navigator in the front passenger seat, were used during the survey. Flight lines were 15 seconds of latitude (400 m) apart and flown east-west, allowing a full census of moose and other wildlife within each sampling block. All encountered moose, white-tailed deer, and elk were counted and classified to age (juvenile vs. adult) and sex. Male cervids were identified by the presence of antlers, although moose cows were confirmed by the presence of a white vulva patch or if an adult was seen in the company of a calf. Due to the timing of the survey (early winter), we were fairly confident that antler drop had not yet occurred for most male moose, elk, and deer. Therefore the classification for these species is probably accurate. We discontinued the classification of white-tailed deer on the final survey day due to time constraints; however, we were still able to determine a buck:doe:fawn classification for at least 100 does from the sample obtained. All other wildlife sightings were also recorded during the survey and a GPS waypoint taken.

Because the sample variance for the medium strata was still quite high after 9 blocks (there was very little variability in the moose counts for the low and high blocks), two more medium blocks were flown for a total of 11 sampling blocks.

Following the helicopter survey, the data was compiled for moose, entered in the "Quad6.xls" program developed as per the Gasaway population model (Gasaway et al. 1986), and a population estimate and confidence interval determined. Deer population estimates for the WMU were not estimated since we based stratification on moose alone. Survey conditions during this period were extremely cold ($< -20^{\circ}\text{C}$), and varied with some scattered snow flurries, hazy skies, and winds, but visibility of the animals was very good with complete ground cover.

Results

A total of 213 moose was seen during the intensive helicopter survey of the 11 sampling blocks. This translated to a population estimate of 921 (+/- 23.9%, 90% C.L.) and a density estimate of 0.32 moose/km² for WMU 509. We were able to classify all the individuals seen, for a classification ratio (bulls:cows:calves) of 22:100:58. The prevalence of ticks appeared very low, with only three calves showing minor infestation.

No population estimate of white-tailed deer was obtained, however we observed 561 deer during the survey including 75 bucks, 323 does, and 132 fawns, for a classification ratio of 23:100:41. Thirty-one deer were unclassified. In addition, five herds of elk were classified during the rotary surveys and including one group of 19 (10 cows, 7 bulls, and 2 calves), 13 (10 cows, 1 bull, and 3 calves), 8 (7 cows and 1 calf), 4 (all bulls), and a group of 2 bulls. Only three bull elk from these herds were large enough to be described as "6-pt. elk". Another large (50+) herd of elk was observed in one of the medium strata blocks, but this was thought to belong to an elk farming operation.

Table 6.11.1. Moose population statistics for WMUs adjacent to and including WMU 509.

WMU	Year	Population Estimate (confidence limits)	Density / km ²	Ratio to 100 Females	
				Males	Juveniles
509	2008	921 (23.9%)	0.32	22	58
509	2001	720 (25.3%)	0.28	83	72
503	2007	--	--	39	51
506	2003	--	--	33	58
510	2001	1245 (24.3%)	0.35	17	53
512	2004	1461 (31.8%)	0.19	40	53
516	2002	751 (15.5%)	0.19	86	76

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