2009 WMU 357 Moose, Mule Deer, White-tailed Deer, and Elk

Section Authors: Dave Stepnisky, Robb Stavne, and Nathan Webb

Suggested Citation:
Stepnisky, D., R. Stavne, and N. Webb. WMU 357 Moose, White-tailed Deer, and Elk. Pages 68-73. In: N. Webb and R. Anderson. Delegated aerial ungulate survey program, 2008-2009 survey season. Data Report, produced by the Alberta Conservation Association, Sherwood Park, Alberta, Canada.

Ungulates in WMU 357 were surveyed previously in 2000, 2003, and 2007. High moose numbers were observed during the 2007 survey, which led to increased numbers of antlerless moose tags being issued by ASRD in 2007. A detailed survey was required to determine the effect of the increased harvest on moose, deer, and elk populations. Additionally, the relatively high use of this area by hunters, and the high level of human-wildlife issues in this WMU also necessitated an updated inventory of moose and deer populations. This report contains the results and analysis of moose, deer, and elk surveys conducted in WMU 357 in 2009.

Study Area

WMU 357 contains all of the County of Grande Prairie No. 1, plus the Crown land portion north of the Wapiti River and the farmland in the Grovedale area (Fig. 6.10.1). The WMU is bordered by the Saddle Hills to the north, the Smoky River to the east, and portions of the Wapiti River to the south. This area includes portions of the Peace River Parkland, Dry Mixedwood, Central Mixedwood, and Lower Foothills subregions, as described by the Natural Regions Committee (2006). Mixedwood forests of aspen and white spruce dominate the non-agricultural portions of the WMU, and are interspersed with peatlands and lotic river systems. Agriculture is prevalent in the Peace Parkland region in the central portions of the WMU, and is dominated by annual cereal and perennial forage crops, interspersed with small aspen stands, ephemeral and permanent wetlands. Increased forestry activity at the green / white zone interface has generated a substantial amount of additional forage for moose.

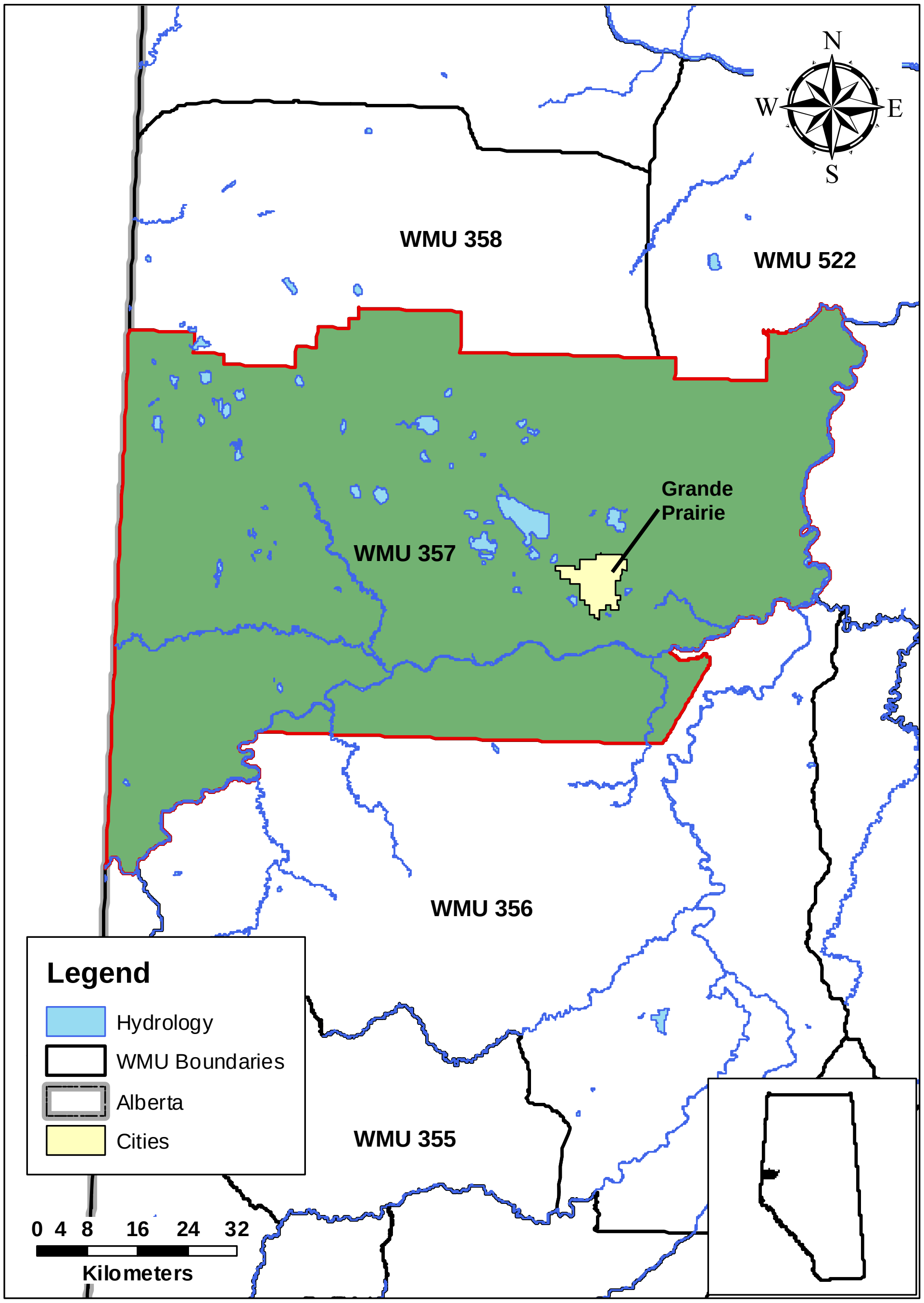

Figure 6.10.1. Location of WMU 357 in Alberta.

Survey Methods

Wildlife staff (ACA and ASRD) flew transects across WMU 357 using fixed-wing aircraft on January 5-6, 2009 to stratify the distribution of moose and deer across 146 sampling blocks. Air speed during stratification flights was approximately 150 km/h, and flight altitude was maintained between 60 and 90 m. Winds were calm, and snow cover was complete. Visibility was generally excellent throughout the survey, however light fog during the afternoon of January 6th prevented the completion of the western portion of one stratification line. Mean ground temperature was -26° C. Locations of moose, deer, incidentally encountered elk, and other pertinent wildlife were recorded using a GPS.

Sample blocks were classified according to the number of moose and deer observed during stratification flights following a modified Gasaway technique (Gasaway et al. 1986, Lynch 1997). Based on relative densities from stratification flights, survey blocks were stratified for moose into low ($<0.06/km^2$), medium ($0.06-0.185/km^2$), and high ($>0.185/km^2$) classifications. For white-tailed and mule deer, survey blocks were stratified using a combination of information derived from transect surveys, as well as through application of local knowledge of animal concentrations, food sources, cover availability, and animal movement patterns in winter. In particular, deer are known to concentrate in areas with food sources such as non-harvested cereal grain swaths, or unprotected grain piles and livestock forage. Sample blocks were 5 minute latitude x 5 minute longitude (approximately 49 km^2). Nineteen sample blocks were randomly selected for intensive search by helicopter. The classification distribution of these blocks differed by species. For moose, 7 of the sample blocks were classed as low, 6 as medium and 6 as high. For mule deer, the classification of survey blocks was broken down as 13 low and 6 medium. White-tail classifications included 11 low survey blocks, 7 medium, and 1 high.

A Bell 206 helicopter was used to determine the number of moose and deer within each of the randomly selected blocks on January 8-11, 2009. Each block was flown in an east to west orientation on flightlines spaced approximately 400 m apart, at 100-140 km/h, and at an altitude of approximately 30 m. Each flight crew consisted of 3 passengers: a navigator/recorder/observer up front, observer left-behind, and observer right-behind. Observers on each side of the helicopter were responsible for a lateral view approximately spanning 200 m from the flight line. All ungulates were identified by sex and age using physical characteristics that were easily observed from the air (e.g. presence of white vulva patch on cow moose, or antlers on males). In addition to observations of moose and deer, sightings of elk, wolves or kill sites were also marked.

On January 13th and 14th, one helicopter was used to conduct complete counts of elk herds that were observed during both the stratification and intensive portions of the moose and deer survey, as well as those known to exist based on agricultural depredation complaints.

Adult males of all ungulate species were classed into one of three categories, as outlined in Table 3.5.1.

Conditions for rotary-wing surveys were generally good with excellent snow coverage. Temperatures varied from -4°C to -18° C. Although winds were generally calm, heavy winds on January 10 resulted in marginally difficult flying conditions. Despite the wind on one day, observation conditions were excellent throughout all portions of the rotary wing survey.

Data were entered into a Gasaway population estimate spreadsheet ("Quad6.xls") and population estimates, male:female:juvenile ratios, and population densities were calculated.

Results

Moose — We estimated 3,087 moose, with confidence limits of 11.9 % (Table 6.10.1). There were 35 bulls/100 cows and 60 calves/100 cows. Twinning rate was 11.1%, and the overall density was 0.45 moose/km^2. Of the bulls that were observed during detailed surveys, 29.3% had already shed their antlers. Of those bulls still with antlers, 52.8% were small, 43.4% were medium and 3.8% were large. Note that proportions of large bulls may be underestimated, due to higher probability of early antler drop.

Mule Deer — We estimated 3,550 mule deer, with confidence limits of 19.4% (Table 6.10.1), for a density of 0.51 mule deer/km^2. There were 46 adult bucks and 111 fawns/100 does, with a twinning rate of 17.2%. The proportion of large-antlered bucks was lower than past surveys (Table 7.10.2), but may be underestimated due to the variation in timing of antler drop among survey years.

White-tailed Deer — In this survey, we estimated 4,883 white-tailed deer, with confidence limits of 35.9% (Table 6.10.1). There were 33 bucks and 114 fawns/100 does and a twinning rate of 21.1%. An additional 386 white-tailed deer were observed in the single high strata sampling block, for a total population estimate of 5,269 white-tailed deer.

Elk — A total of 1,605 elk were observed, with 13 bulls and 44 calves/100 cows. This is a minimum count of elk and since we did not use a randomized design we are not able to estimate confidence intervals.

Table 6.10.1. Comparison of current aerial survey results in WMU 357 with previous surveys.

Species	Year	Population Estimate (conf. limits)	Density / km²	Ratio to 100 Females	
				Males	Juveniles
Moose	2009	3087 (11.9%)	0.38	35	60
	2007	4720 (11.3%)	0.68	29	43
	2003	4268 (13.5%)	0.62	30	54
	2000	2636 (16.3%)	0.38	23	60
Mule Deer	2009	3550 (19.4%)	0.51	46	111
	2007	3861 (25.4%)	0.56	37	53
	2003	4235 (16.1%)	0.61	41	85
	1998	3924 (20.7%)	0.57	31	100
White-tailed Deer	2009	4883 (35.9%)	0.70	33	114
	2007	3518 (23.0%)	0.51	21	43
	2003	3143 (19.7%)	0.46	26	117
	1998	2372 (32.3%)	0.34	47	103

Table 6.10.2. Comparison of age structure of male ungulates in WMU 357

Species	**Year**	**Antler Classification**		
		Small	**Medium**	**Large**
Moose	2009 (n=75)	53%	43%	4%
Mule Deer	1998 (n=78)	56%	21%	23%
	2003 (n=80)	43%	36%	21%
	2007 n= 124	43%	46%	11%
	2009 (n=73)	45%	52%	3%
White-tailed Deer	1998 (n= 69)	35%	45%	20%
	2003 (n=52)	48%	38%	14%
	2007 (n=74)	51%	31%	18%
	2009 (n=98)	40%	46%	10%
Elk	2009 (n=91)	71%	29%	0%

Literature Cited

Gasaway, W.C., D. DuBois, D.J. Reed, and S.J. Harbo. 1986. Estimating moose population parameters from aerial surveys. Biological Papers of the University of Alaska No. 22, Fairbanks, Alaska. 108 pp.

Lynch, G. M. 1997. Northern moose program, moose survey field manual. 68pp.

Natural Regions Committee. 2006. Natural Regions and Subregions of Alberta. Compiled by D.J. Downing and W.W. Pettapiece. Government of Alberta. Pub. No. I/005.


Photo: Nathan Carruthers