2009 WMU 328 Moose and Elk

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WMU 328 is a desirable WMU for both moose and elk hunters, and receives high pressure from both recreational and un-regulated hunting. More than 700 hunters pursue elk in this WMU each year, and it consistently has the largest number of elk hunters in the entire Clearwater area. Regular population inventories are required to balance losses due to hunter harvests, predation, and severe winters. The objectives of this survey were to estimate the total moose and elk population sizes in this WMU, and to determine herd composition for moose. WMU 328 is surveyed approximately every 3 - 4 years on a rotational basis for moose and/or elk.

In 2008, hunting of only antlered moose was permitted, with a season from September 24 to November 30. The harvest goal for moose is 3% of the estimated pre-season population. According to hunter harvest questionnaires, moose hunter success has averaged 48% over the last five years (ASRD 2003-2007). For elk, a general season with 3-point antler minimum is in place to protect the majority (~80%) of yearling bulls and to increase bull: cow ratios. The bow season (general license) is from August 25 – September 17 and the rifle season from September 17 – November 30. Bull elk hunter success from hunter harvest questionnaires has averaged 2.5% over the last four years (ASRD 2003-2007). There is no season for antlerless elk.

Study Area

WMU 328 is located west of Rocky Mountain House (Fig. 6.4.1). The North Saskatchewan and Brazeau Rivers form the southern and northern boundaries; the Forestry Trunk Road and the Sunchild Road form the western and eastern borders. WMU 328 straddles the lower and upper foothills natural sub-regions (Natural Regions Committee 2006). The dominant land cover type is conifer (71%) and mixed-wood forests (4%), followed by wetlands/rivers/lakes (5%), shrub/meadow complexes (4%),

and other (e.g. rock, soils or burn- 3%) (Beyer et al. 2004). Cut-blocks comprise an additional 13% of the WMU. The industrial footprint is widespread; petroleum extraction and forestry are the dominant disturbances. Road density is currently 0.42 km/km^2.

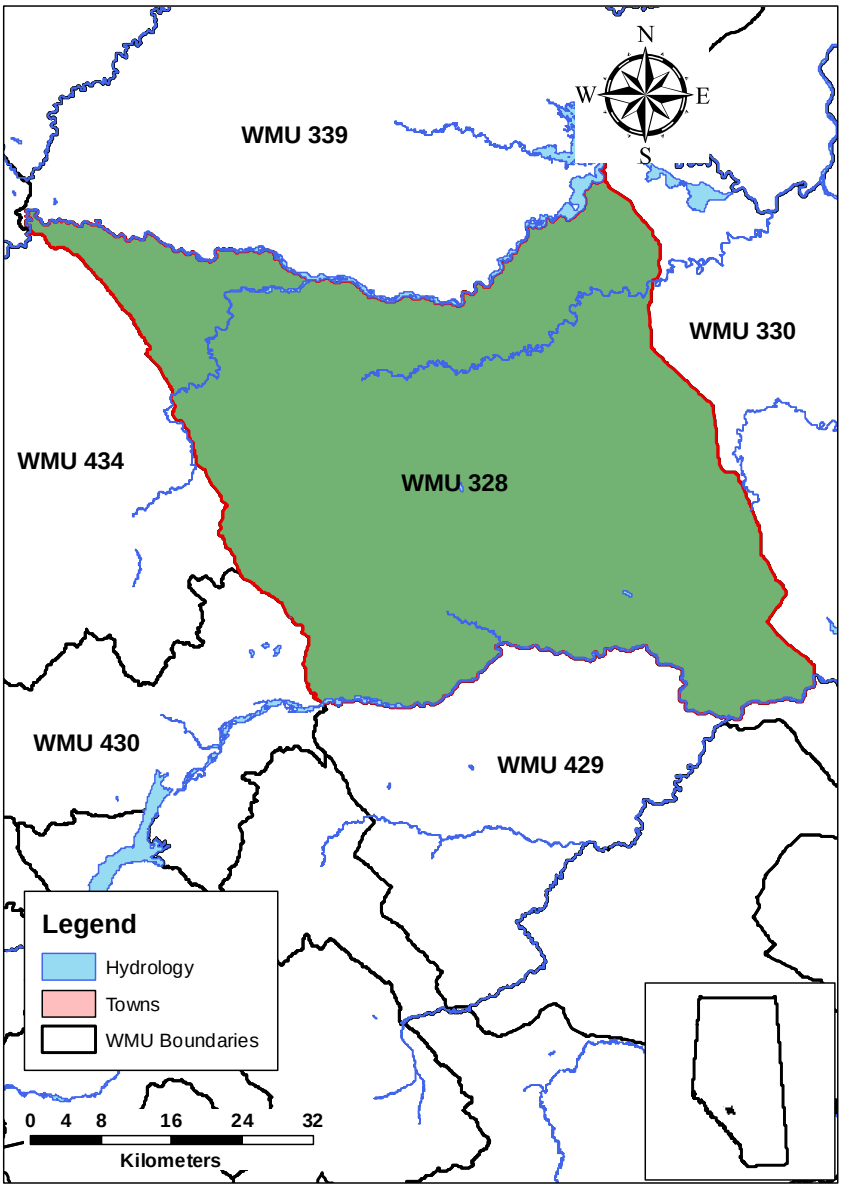

Figure 6.4.1. Location of WMU 328 in Alberta.

Survey Methods

We stratified the WMU for moose based on numbers counted from a Cessna 185 fixed-wing aircraft on March 10-11, 2009 (Gasaway et al. 1986). During the stratification survey the fixed-wing aircraft flew at approximately 160 km/h, 90 m above the ground depending on land cover and topography (higher in dense forest and greater topography). We flew transects in an East-West direction at 1 minute longitude (~1 km) intervals (Lynch and Shumaker 1995, Lynch 1997). Observers scanned 300-500 m out from the aircraft and recorded moose locations found along the transect. Temperatures during stratification flights were -30 to -10° C, and snow conditions were excellent.

Following the stratification survey, moose counts and GPS locations were uploaded into a GIS and intersected with a 3 minute latitude X 5 minute longitude sampling grid to determine the number and density of moose observed in each block. Too few moose were observed during stratification flights to allow accurate classification of sample blocks into 3 strata (example: zero moose were observed in 52/94 = 55% of sample blocks). Therefore, sample blocks were classified into 2 strata, using a combination of direct sightings of moose during stratification flights, as well as sightings of moose tracks. Sample blocks where no moose were observed were classified as 'low', with the exception of 7 sample blocks with abundant moose tracks, which were classified as 'high'. All sample blocks where 1 or more moose were observed were classified into the 'high' strata. Overall, 45 sampling blocks were classified as low, and 49 were classified as high. We randomly selected survey blocks for inclusion in the intensive survey using the Excel Seed file methods (Shumaker 2001C).

We stratified the WMU for elk using a winter resource selection function (RSF) originally developed by the Central East Slopes Elk Study (Webb and Anderson 2009). After calculating the average RSF value in each sample block, we used Jenks Natural Breaks to divide the sample blocks into 3 strata, resulting in 18 sample blocks classified as low, 39 as medium, and 37 as high.

We searched sample blocks with a Bell 206 Jet Ranger helicopter from March 12 - 14, 2009 (Gasaway et al. 1986). We surveyed a total of 16 blocks: 8 L and 8 H for moose; 5 L: 6 M: 5 H for elk. We flew approximately 120 km/h, 30 - 50 m above the ground at 400 m intervals to ensure that each block was completely covered. A navigator sat next to

pilot and observed and recorded animal locations, while 2 observers sat in the back of the aircraft. Each observer was responsible for scanning out to approximately 200 m from the aircraft.

We circled all moose to determine age, sex, total number of individuals, and condition. Most bulls at this time had shed their antlers but the white vulva patch below the tail indicated a cow moose. Light brown patches, typically occurring on the shoulders and back, indicated tick infestation. We also counted elk and determined their sex and age-class using the presence of antlers and body size to differentiate bulls and calves. Some misclassification may have occurred as some bulls may have already shed their antlers and calves may be difficult to distinguish from cows in March.

Moose and elk counts per block were each summed and entered into separate Excel Quad files to determine population estimates (Gasaway et al. 1986). The intensive surveys were flown during constant weather: partially cloudy, calm days with average temperatures ranging from -18 to +8° C. Snow conditions deteriorated slightly as the survey progressed, exposing most south facing slopes and black stumps in open areas.

Results

Moose — During the intensive survey, 57 moose were counted in 16 survey blocks. We estimated the total population at 335 ± 90 (C.I. = 26.8%) with a density of 0.12 moose/km^2 (Table 6.4.1). The composition of moose was 55 bulls/100 cows and 23 calves/100 cows. No twins were observed. We saw 4 moose with slight evidence of ticks.

Elk — During the intensive survey, 43 elk were counted in 16 survey blocks. We estimated the total population at 241 ± 213 (C.I. = 88.2%) with a density of 0.08 elk/km^2 (Table 6.4.1). The composition of elk was 5 bulls/100 cows (or 5 bulls/100 antlerless) and 3 calves/100 cows. Bull/cow and calf/cow ratios may be underestimated because bull elk generally shed their antlers in March or early April and calves may be difficult to distinguish from cows in March.

Table 6.4.1. Comparison of aerial moose and elk survey results from 2002, 2005 and 2009 in WMU 328.

Species	Year	Population Estimate (conf. limits)	Density / km²	Ratio to 100 Females	
				Males	Juveniles
Moose	2009	335 (26.8%)	0.12	55	23
	2005	503 (--)	--	43	33
Elk	2009	241 (88.2%)	0.08	5	3
	2002	899 (46.8%)	0.34	--	--

*2002 survey stratified using % tree canopy; 2009 survey stratified using an RSF-based approach. A sightability correction was not applied in either year