2012 Wildlife Management Unit 320 and 322 moose

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Wildlife management units 320 and 322 are desirable units for moose hunters and receive high pressure from recreational hunting. To improve moose management, ASRD replaced the general hunting season in these WMUs in the late 1990s, with a special license draw system for both antlered and antlerless moose, during both the archery and general seasons. The harvest goal for antlered and antlerless moose is presently 4% and 1%, respectively, of the estimated pre-season populations. Moose hunter success according to hunter harvest questionnaires has averaged 45% for antlered moose and 60% for antlerless moose over the last five years in WMU 320, and 78% and 71%,

respectively, in WMU 322. WMU 320 and 322 were last surveyed for moose in 2008. The objectives of the 2012 survey were to estimate the total population and herd composition for moose in these WMUs.

Study area

Wildlife management units 320 and 322 are located southeast of Rocky Mountain House, extending down towards Sundre (Figure 1). Highway 22 forms part of the western perimeter; Highway 766 and the Red Deer River the eastern perimeter; Highway 12 the northern extent (WMU 322); Highway 584 and the Red Deer River the southern extent (WMU 320); while Highway 54 divides the two units. Combined, these two WMUs cover an area of approximately 2,313 km^2. Both WMUs straddle the Lower Foothills, Central Mixedwood and Dry Mixedwood Natural Subregions of Alberta (Natural Regions Committee 2006).

Survey methods

We stratified WMU 320 and 322 for moose using a Cessna 185 airplane on 23 – 24 January 2012 (Gasaway et al. 1986). The aircraft flew at approximately 100 – 130 km/h, approximately 240 m above the ground, depending on vegetation cover and topography (higher elevation in dense forest and greater topography). We flew stratification flight transects in an east – west direction at 1 minute longitude intervals (1800 m apart) (Lynch and Shumaker 1995; Lynch 1997). Observers scanned approximately 400 m out from each side of the aircraft and recorded moose locations found along each transect. Temperatures were -13 to +2 degrees Celsius and snow conditions were good.

After the stratification survey flight, moose counts and GPS locations were uploaded into a GIS and intersected with a fishnet grid overlaid onto a map of WMU 320 and 322. The grid divided WMU 320 into 59 survey blocks and WMU 322 into 103 survey blocks (3 min latitude x 3 min longitude). We classified survey blocks into strata according to the density of moose counted during the stratification flight. Low blocks had 0 moose/km^2, medium blocks had 0.01 – 0.15 moose/km^2 and high blocks had $\geq$ 0.16 moose/km^2. In WMU 320, 27 blocks (46%) were classified as low, 19 (32%) as medium, and 13 (22%) as high density blocks. In WMU 322, 56 blocks (54%) were classified as low, 29 (28%) as medium, and 18 (18%) as high density blocks. We then randomly

selected survey blocks for inclusion in the intensive rotary-wing survey flight, using the Excel Seed file methods (Shumaker 2001).

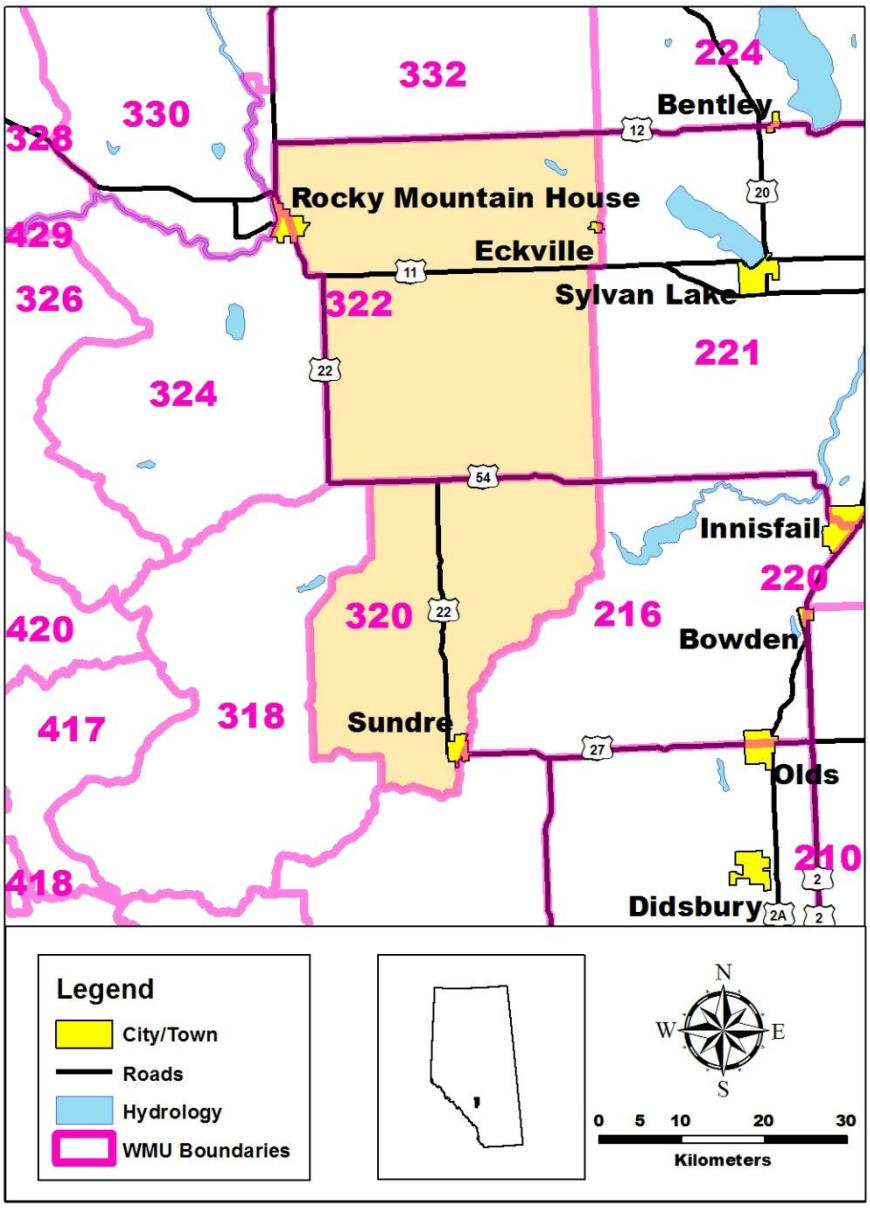

Figure 1. Location of Wildlife Management Units 320 and 322 in Alberta.

We searched survey blocks with a Bell 206B helicopter from 25 – 27 January 2012. We surveyed 17 blocks in WMU 320; 6 low, 6 medium, and 5 high, and 20 blocks in WMU 322; 8 low, 10 medium, and 2 high. We flew approximately 120 km/h, 60 – 90 m above the ground, at 400 m flight line spacing to ensure full coverage of each survey block. A navigator sat next to the pilot and observed and recorded animal locations, while 2 observers sat in the back of the aircraft. Each observer was responsible for observing approximately 200 m from each side of the aircraft.

We counted and recorded locations of moose, deer (white-tailed and mule deer were combined), elk, coyotes, and eagles. We determined age, sex, and total counts of moose; circling the animals if necessary. Most bulls at this time had shed their antlers, but cows were easily distinguishable by the white vulva patch below their tails. Light brown or grey patches, typically occurring on the shoulders and back, indicated winter tick (*Dermacentor albipictus*) infestation and were noted.

Moose counts per survey block were summed and entered into separate Excel Quad files to determine population estimates (Lynch 1999). We did not correct for sightability; therefore, overall counts should be considered as minimum population estimates and direct comparisons of survey results among years may be difficult.

The intensive survey flights were flown during partially cloudy, calm days with average temperatures ranging from -13 to +2 degrees Celsius. Snow conditions were good throughout the survey area.

Results

During the intensive survey flights of WMU 320, a total of 98 moose were counted (27 bulls, 39 cows, 25 calves and 7 unclassified). In WMU 322, a total of 136 moose were counted (35 bulls, 58 cows, 37 calves and 6 unclassified). From this, we estimated the total moose population to be between 227 and 315 for WMU 320, and between 401 and 607 for WMU 322 (Table 1). Population estimates for moose in WMU 320 and 322 declined moderately between 1999 and 2008, but seem to have rebounded in 2012. During the 2012 survey, 5 cows were observed with twins and 30 moose were observed with varying degrees of tick related hair loss.

Table 1. Comparison of aerial survey results for moose in Wildlife Management Units 320 and 322 from 1999 – 2012.

WMU/Year	Population estimate (90% confidence limits)	Moose/km^2	Ratio to 100 Females	
			Males	Juveniles
WMU 320				
2012	271 (±16.2%)	0.31	69	64
2008	175 (±29.5%)	0.20	8	76
2002	395 (±22.6%)	0.44	--	--
1999	293 (±21.7%)	0.33	26	53
WMU 322				
2012	504 (±20.4%)	0.35	60	64
2008	426 (±29.9%)	0.30	28	55
2002	548 (±26.6%)	0.38	--	--
1999	724 (±21.7%)	0.54	43	59

"--" Demographic ratios were not available from ASRD.

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