2010 Wildlife Management Unit 326 elk and moose

Section Authors: Anne Hubbs and Maria Didkowsky

Hubbs, A., and M. Didkowsky. 2012. Wildlife Management Unit 326 elk and moose. Pages 43-49. *In:* M. Ranger and S.Webb. Delegated big game surveys, 2009/2010 survey season. Data Report, D-2011-001, produced by the Alberta Conservation Association, Sherwood Park, Alberta, Canada.

WMU 326 is a desirable unit for both moose and elk hunters. There are approximately 400 elk hunters annually in this unit, with demand for licenses during the 'Calling Season' exceeding the supply for the past few years. Moreover, antlered and antlerless moose and elk are harvested year-round by aboriginal people in this area.

In 2008, hunting of only antlered moose was permitted, with a season from 24 September – 30 November. The season was divided into two seasons: a 'Calling Season' from 24 September – 31 October, and a 'Late Season' from 1 – 30 November. The harvest goal for moose is presently 4% of the estimated pre-season population. Moose hunter success according to hunter harvest questionnaires has averaged 56% in the Calling Season and 61% in the Late Season over the last five years (ASRD unpublished data, 2004 - 2008).

The harvest goal for bull elk is 6% of the estimated pre-season population (or 37% of antlered males). A general hunting season with a 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 25 August – 16 September and the rifle season from 17 September – 30 November. Bull elk hunter success from hunter harvest questionnaires has averaged 1.2% over the last five years (ASRD unpublished data, 2004 - 2008). There is no season for antlerless elk in this unit.

Regular population inventories are required in this unit to assist in managing losses due to hunter harvest, predation, and severe winters. The objectives of this survey were to estimate the total moose and elk population sizes in this unit, and to determine herd composition for moose.

Study area

WMU 326 is located south of the North Saskatchewan River, west of the Clearwater River, and east of the Ram River (Figure 1). The southern area borders Seven Mile Flats, and Rocky Mountain House is located northeast of the WMU. The unit is 1,046 km^2 in size and elevation varies between 800 m and 2000 m, with terrain consisting of moderate to steep rolling hills, with increasing ruggedness towards the Rocky Mountains (Allen 2005). The unit straddles the lower and upper foothills natural subregions (Natural Regions Committee 2006), and has three traditional elk wintering ranges comprising 5% of the WMU. The dominant land-cover from the Alberta Vegetation Inventory (AVI) is conifer (76%), followed by non-forest (19%; e.g. shrub, rocks, anthropogenic features), mixedwood (3%), and deciduous (2%). Cut blocks comprise approximately 36% (~34,800 ha) of the WMU. In general, the industrial footprint is widespread with oil and gas, and

forestry as the dominant disturbances. Road density was greater than 0.56 km/km^2 (> 555 km) within the WMU.

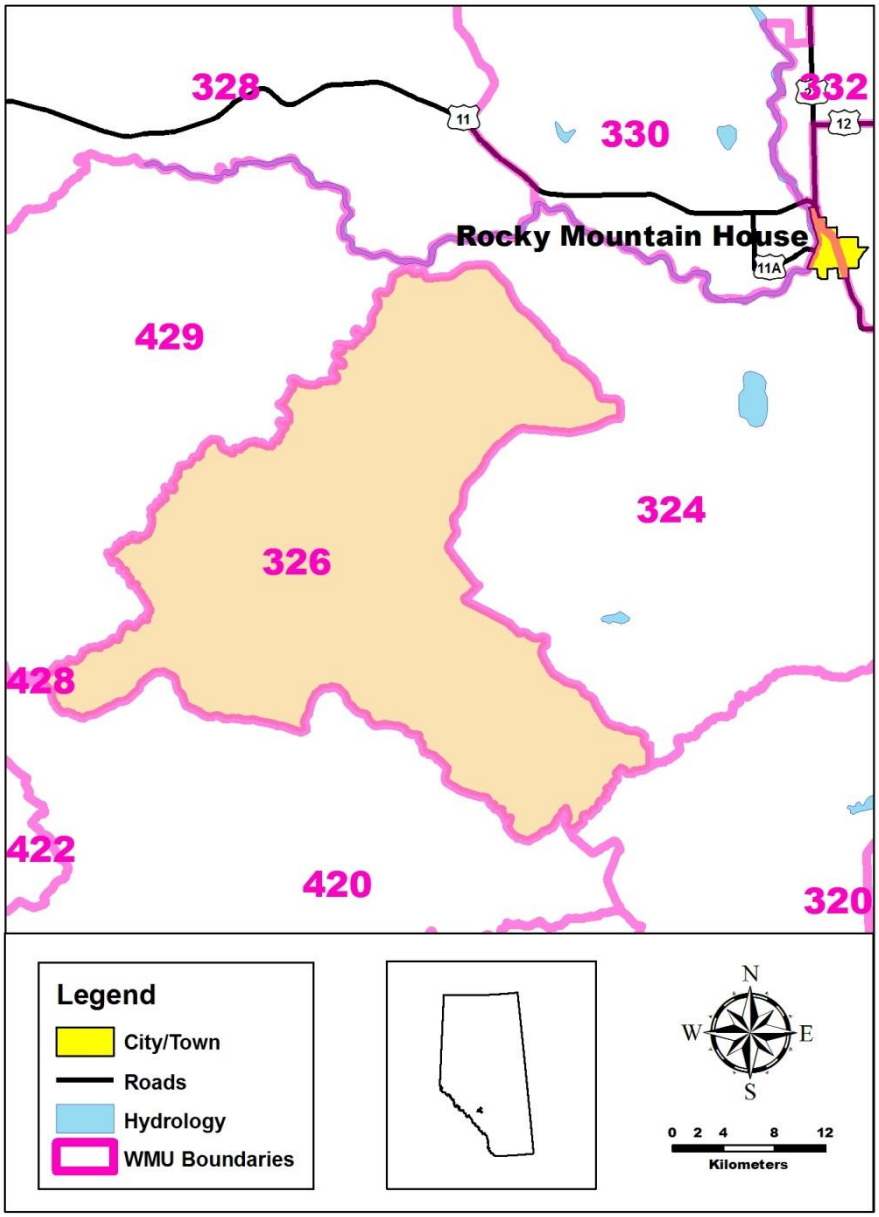

Figure 1. Location of Wildlife Management Unit 326 in Alberta.

Survey methods

Prior to the survey, we used a geographic information system (GIS) to delineate survey blocks by creating a 2 minute latitude by 2 minute longitude grid overlaid on a map of WMU 326. This method of delineating survey blocks is consistent with previous surveys of this unit.

Moose Stratification – We classified 2 X 2 blocks into three strata (low, medium and high probability of moose occurrence) using the Alberta Vegetation Inventory. These methods were generally consistent with those used previously for this WMU.

First, varying weights were assigned to each of the six dominant land cover types, according to their expected probability of moose occurrence. Deciduous and deciduous-dominated mixedwood were assumed to have the highest likelihood of moose, followed by cut blocks less than 30 years old, then coniferous-dominated mixedwood and lastly, conifer stands. Non-forest, which included anthropogenic features, was assumed to have no probability of moose occurrence. Because non-forest also included shrub habitat, the likelihood of moose occurrence may have been underestimated in this case. Also, in the future, greater weight should be assigned to cover within river valleys or flats.

Second, an overall weighting was generated for each block based on the combined weight from each land cover type. Blocks with the highest and lowest 20% weights were assigned to the 'high' and 'low' strata, respectively. The remaining blocks were assigned to the 'medium' strata. Generally, conifer blocks with >85% conifer coverage consist of relatively low quality habitat and have issues related to low sightability due to dense cover. As a result, blocks with >85% conifer coverage were not assigned to strata and were not used in deriving a moose population estimate for the WMU. This method is consistent with previous surveys in WMU 326 (Allen, pers. comm.).

Overall, 18 blocks were classified as low, 42 as medium and 20 were classified as high. We then randomly selected survey blocks for inclusion in the intensive survey using the random number generator in Excel.

Elk Stratification - The relative probability of elk occurrence across the WMU was calculated for winter habitat using the Elk Habitat Planning Tool (Webb and Anderson 2009). The elk tool uses resource selection function (RSF) models developed by Frair et al. (2007) to predict habitat

quality and risk for elk across the landscape. Updated habitat cover variables and industrial disturbance (post-2003) could not be incorporated into the Elk Habitat Planning Tool, and thus were not considered in the stratification process.

We calculated the average RSF value in each sample unit to determine relative probability of elk occurrence. We used Jenks Natural Breaks to divide the sample units into 3 strata, creating low, medium, and high strata. We then randomly selected survey blocks for inclusion in the intensive survey using the random number generator in Excel.

We surveyed sample blocks with a Bell 206B helicopter from 4 – 6 February 2010 (Gasaway et al. 1986; ASRD 2010). We surveyed a total of 27 blocks: 8 low, 11 medium and 8 high for moose; 5 low, 14 medium and 8 high 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 the pilot and observed and recorded animal locations, while two observers in the back seat of the aircraft were responsible for scanning out to approximately 200 m from each side of the aircraft.

We counted and recorded locations of moose and elk. 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. Sex and age composition data of elk was collected using the presence of antlers and body size to differentiate bulls and calves from cows. 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.

Moose and elk counts per block were each summed and entered into separate Quadrat Survey Method Program files to determine population estimates (Gasaway et al. 1986; ASRD 2010).

In general, the visibility and snow cover during the survey was good. Daily temperatures ranged from -20 to -10 degrees Celsius. Snow conditions deteriorated slightly as the survey progressed, exposing some parts of south facing slopes and black stumps in open areas.

Results

Moose — During the survey, 94 moose were counted in 19 survey blocks. The total moose population was estimated at 316 to 518 moose (90% confidence limit) as compared to the 2005 population estimate of approximately 300 moose (confidence limits unknown) (Table 1). Ticks were not prevalent; only one moose had slight hair-loss.

Elk — We were unable to calculate a population estimate for elk due to very low densities, but did document a minimum count of 44 elk throughout the WMU. Of the 44 elk, only one group of 38 elk (including 6 calves) was observed within the 27 survey blocks. An additional group of 6 bull elk was observed outside of the assigned survey blocks.

Elk populations have declined over the last four or more years. In 2005, there were an estimated 200 elk (confidence limits unknown) in WMU 326 (Table 1). In 2001, this estimate was 327 +/- 15% elk (Table 1) when the Jenk's classification system was used for stratification (as per our survey) and approximately 250 elk when trend surveys were used (Allen 2005). An average of 11 elk, ranging from a low of 4 to a high of 26, have been seen on 3 wintering ranges within this unit from 2002 - 2008. During the 2010 survey the one group of 38 elk observed was located on one of the wintering ranges.

Table 1. Comparison of aerial moose and elk survey results from 2001, 2005 and 2010 in Wildlife Management Unit 326.

Species	Year	Population Estimate (90% confidence limits)	Animals/km^2	Ratio to 100 Females	
				Males	Juveniles
Moose	2010	417 (±24.1%)	0.40	80	13
	2005	300 (--)	0.29	--	--
	2001	--	--	--	--
Elk	2010	--	--	--	--
	2005	200 (--)	0.19	--	--
	2001	327 (±15.0%)	0.31	--	--

Literature Cited

Alberta Sustainable Resource Development (ASRD). 2010. Aerial ungulate survey protocol manual. Produced by the Fish and Wildlife Management Division, Edmonton, Alberta, Canada. 65 pp.

Allen, J.R. 2005. Use of sightability models and resource selection functions to enhance aerial population surveys of elk (Cervus elaphus) in Alberta. M.Sc. Thesis, University of Alberta, Edmonton, Alberta, Canada. 69 pp.

Frair, J.L., E.H. Merrill, and M.S. Boyce. 2007. Modeling the cumulative effects of wolves and industrial activities on habitat effectiveness for elk in the Rocky Mountains of Alberta, Canada. Final report submitted to the Alberta Conservation Association, Edmonton, Alberta, Canada. 29 pp.

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, USA. 108 pp.

Natural Regions Committee. 2006. Natural regions and subregions of Alberta. Compiled by D.J. Downing and W.W. Pettapiece. Pub. No. T/852, produced by the Government of Alberta, Edmonton, Alberta, Canada.

Webb, S.M., and R.B. Anderson. 2009. Predicting habitat value for elk in the central east slopes of Alberta. Technical Report, T-2009-002, produced by the Alberta Conservation Association, Rocky Mountain House, Alberta, Canada. 32 pp + App.