



# Aerial Wildlife Survey Report

## Wildlife Management Unit 119 Aerial Ungulate Survey (2020 - 2021)

### Background

Alberta Wildlife Management Unit (WMU) 119 (South Irvine WMU) is located southeast of Medicine Hat, and covers an area of approximately 1,297 km<sup>2</sup>. The majority of the unit is within Alberta's mixedgrass natural subregion, with the north portion extending in to the dry mixedgrass natural subregion. The WMU includes the area from Eagle Butte Road (range road 51) east to the Alberta/Saskatchewan border, and south of the TransCanada Highway to the northern boundary of Cypress Hills Interprovincial Park. Several drainages containing large coulee systems originate in the Cypress Hills and extend northward through the WMU, including Ross Creek, McAlpine Creek, and MacKay Creek. Land is primarily deeded, and general habitat and land use consists of cultivated cropland for the purpose of annual crop production, and tame and native grassland used for cattle grazing. Some smaller parcels of crown owned native grassland under grazing lease are also present. Oil and gas development is established throughout the WMU, and in recent years, renewable energy development has also increased. Chronic Wasting disease is moderately established within the WMU, with an overall prevalence of 6.7% in mule deer bucks and 2.8% in mule deer does from samples submitted in 2020.

The established pre-hunting season population goal for WMU 119 is 1650 mule deer and 925 white-tailed deer. Ungulate harvest in WMU 119 is currently managed using a special license draw for antlered and antlerless mule deer, antlerless white-tailed deer, elk, and moose. During the archery only season, antlered white-tailed deer and mule deer are hunted with general licenses, which are available without the requirement of a Special License obtained through the draw process. Landowner licenses for mule deer and elk are also available to eligible residents.

A survey for ungulates (mule deer, white-tailed deer, and moose) was last conducted for WMU 119 in 2010 using the modified Gassaway/random stratified block methodology (Random Block) (Table 1). With over ten years since the last survey, an updated population estimate is needed to ensure management goals are based on more relevant data. It is important to consider the difference in methods when comparing results between the surveys.

The objective of the February 2021 survey was to assess the status of the ungulate population in WMU 119 by determining estimates for abundance, density and age-sex composition. We also recorded observations of additional species of game management or conservation concern including elk, pronghorn, carnivores, game birds, and sensitive or at risk species.

### Survey method

A rotary wing transect survey was conducted February 13-14, 2021 flying 22 east-west lines at 1.85 km intervals, with 43% coverage (800 m wide survey strip, area surveyed 551 km<sup>2</sup>) for a total linear survey effort of 689 km. At each observation point, ungulates were classified by species, and when possible, sex and age were recorded. Antler size for deer was classified as 'small' (spike or two points on one or both antlers), 'medium' (antlers with 3 or more points; antlers inside ears), or large (antlers with ≥ 4 points, antlers outside of ears).

Because transects varied in length, the average density (R; #/km<sup>2</sup>) of mule deer, white-tailed deer, and moose was calculated by multiplying the number of animals per transect ( $\sum x$ ) by total area searched (total survey strip area [ $\sum z$ ]) (Jolly 1969, as described in Krebs 2014). Average density (R) was multiplied by the WMU (Z) area to determine population estimates with a 90% confidence intervals. Confidence interval width was calculated by multiplying the t statistic for the left-tailed inverse of the Student's t-distribution, (t<sub>0.05, df=n-1</sub>) by standard error (SE; without replacement) of the abundance estimate where SE=sq root variance, and variance= $N*(N-n)/(n*(n-1))*(\sum x^2 + R^2*\sum z^2 - 2*R*\sum xz)$  with N as the total number of possible transects given 100% coverage, and n as the number of transects sampled.

Moose and Elk observations made during the survey were also recorded, though population estimates were not calculated as the survey method and/or small sample size did not allow for meaningful estimates.

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## Results

A total of 787 mule deer were observed with an average groups size of 9 (range 1-38). The estimated density was 1.43 mule deer/km<sup>2</sup> and the estimated abundance was 1,852 individuals (90% CI 1,432 – 2,271). A total of 645 mule deer were successfully classified and the buck:doe:fawn ratio was estimated to be 44:100:75. That results in an estimated 2021 winter mule deer population of 370 bucks, 850 does, and 634 fawns. Of the 131 mule deer bucks classified, 35 (27%) were classified 'small', 39 (30%) 'medium', and 57 (44%) 'large'. The 2021 population estimate represents a 45% increase from the last aerial ungulate survey population estimate for mule deer within WMU 119 (conducted in 2010) (Table 1). When comparing survey results, it is important to note that the last survey used a different survey methodology (modified Gassaway/random block).

A total of 400 white-tailed deer were observed with an average group size of 8 (range 1-42). The estimated density was 0.73 deer/km<sup>2</sup> and the estimated abundance was 941 individuals (90% CI 603 – 1,279). A total of 165 white-tailed deer were successfully classified and the bucks:does:fawns ratio was estimated to be 11:100:60. That results in an estimated 2021 early winter white-tailed deer population of 61 bucks, 550 does, and 330 fawns. Of the 11 white-tailed deer bucks classified, 6 (55%) were classified 'small', 3 (27%) 'medium', and 2 (18%) 'large'.

A total of 7 moose were observed in 5 groups. The low number of moose counted was not enough to estimate population, however the results indicate that moose density within the WMU is generally low. A total of 802 pronghorn were observed during the survey. Other species observed included sharp-tailed grouse, bald eagle, golden eagle, porcupine, and coyote. No elk were observed within the WMU, as wintering herds were confined to adjacent WMUs during this survey.

**TABLE 1: UNGULATE SURVEY ESTIMATES FOR WMU 119**

Estimates include number of individual ungulates, density and age-sex composition ratios. Modified gassaway/random block and transect methods have been used. Ranges in parentheses represent 90% confidence limits.

Species	Survey year	Survey method	Abundance estimate mean (90% CI)	Density (km <sup>2</sup> )	Ratio to 100 females	
					Males	Juveniles
Mule deer	2003	Modified Gassaway/Random Stratified Block	1440 (1123 – 1756)	1.11	N/A	N/A
Mule deer	2010	Modified Gassaway/Random Stratified Block	1023 (950 – 1096)	0.79	20	33
Mule deer	2021	Transect	1852 (1432 – 2271)	1.43	44	75
White-tailed deer	2021	Transect	941 (603 – 1279)	0.79	11	60

## Literature

Krebs, C.J. 2014 Ecological Methodology, 3rd Edition. Chapter 4, Estimating Abundance: Quadrat Counts [online] [https://www.zoology.ubc.ca/~krebs/downloads/krebs\\_chapter\\_04\\_2017.pdf](https://www.zoology.ubc.ca/~krebs/downloads/krebs_chapter_04_2017.pdf)

Jolly, G.M. 1969. Sampling methods for aerial census of wildlife populations. E. Afr. Agric. For. J. 34:46-49.