



Aerial Wildlife Survey Report

Wildlife Management Unit 353 Aerial Ungulate Survey (2023)

Background

Wildlife Management Unit (WMU) 353 is located in West-Central Alberta approximately 35 km south of Valleyview, covering an area of 4612 km². The WMU overlaps portions of both ranges for the Little Smoky and A La Peche woodland caribou populations. Ongoing wolf reductions in these areas have halted declines in these caribou populations, avoiding extirpation, until habitat restoration actions can eventually support self-sustaining populations. It is important to manage overabundant moose densities in the Little Smoky and A La Peche caribou ranges where predator control has reduced natural moose mortality, and populations would otherwise grow. The special management area in the western portion of the WMU, where an antlerless moose special license is available (353W), is important for maintaining stable moose populations. The objective of this survey (2023) is to update the population estimate and ratio for sex and age classes of moose since the last survey was completed in 2016.

Survey Method

The aerial survey for moose in WMU 353 was conducted on January 28th and 29th, 2023. Distance sampling methods (AEP 2016, Buckland et al., 2001) were used to determine moose population and density estimates. Transects (N = 513), up to 10 km in length and oriented north-south (Fig. 1), were established throughout the unit with 1.2 km spacing. A random sample (n = 233) of these transects was flown during this survey. The unit was stratified into 2 strata: 353E and 353W, based on the boundary delineating antlered and antlerless hunting seasons. Moose were classified by age (adult or young) and sex. Canopy cover (0-33%, 43-66%, and >66%) within 10 m of the moose was included as a covariate.

Results

Total survey effort included 1628.94 km of transects and approximately 40 hours of flight time. In total, 351 moose were included in the analysis from 235 independent group observations. A total of 343 moose were successfully classified, of which 167 were cows, 81 were calves, and 95 were bulls. Of the bulls observed, 88% had already shed their antlers at the time of the survey. Of those with antlers (n=13), 7 were considered small (small spike or forked antlers) and 6 were considered medium (small palmated antler 'paddles'). The bull:cow and calf:cow ratios were 0.57 (95% CI 0.44 - 0.70) and 0.49 (95% CI 0.41 - 0.57), respectively. The density estimate was 0.57 moose/km² (90% CI 0.49 - 0.66). The estimated moose population for WMU 353 is 2614 (90% CI 2261 - 3023). See Table 1 for a comparison to previous survey results. The density estimate for 353E was 0.68 moose/km² (CV = 10.52%, 90% CI 0.57-0.81), compared to 0.50 moose/km² in 353W (CV = 12.52%, 90% CI 0.41-0.61). The estimated population for 353E is 1158 (90% CI 973-1378) and 1456 (90% CI 1185-1790) for 353W (Table 2).

The moose population in WMU 353 is estimated to have increased by 3.1% since 2016, representing a relatively stable population with an annual average population growth rate of 1.00 (90% CI 0.95-1.05). In the antlerless harvest area of WMU 353, the population has increased by 38.9%, representing an average annual (geometric mean) population growth rate of 1.04 (90% CI 0.95-1.12).

We also observed 44 white-tailed deer (4 does, 9 fawns, 31 unclassified), 8 mule deer (4 does, 1 fawn, 3 unclassified), and 8 elk (4 cows, 4 calves) within WMU 353 during the survey.

TABLE 1: COMPARISON OF CURRENT AND PREVIOUS POST-SEASON SURVEY ESTIMATES FOR MOOSE IN WMU 353

Estimates include number of individual moose, density, and age-sex composition ratios. The survey methods refer to Gasaway random stratified block (RSB) and distance sampling methods (DS).

Survey year	Survey method	Population size (90% CI)	Density (/km ²)	Ratio to 100 females	
				Males	Juveniles
2001/02	RSB	1298 (974-1621)	0.28	57	39
2006/07	RSB	2332 (1937-2728)	0.51	48	50
2008/09*	RSB	874 (650-1097)	0.32	41	35
2012/13	DS	1899 (1629-2213)	0.41	48	42
2015/16	DS	2609 (2087-3260)	0.56	47	40
2022/23	DS	2614 (2261-3023)	0.57	57	49

*Only the antlerless harvest area of WMU 353 was surveyed in 2009

TABLE 2: COMPARISON OF CURRENT AND PREVIOUS POST-SEASON SURVEY ESTIMATES FOR MOOSE IN WMU 353 (ANTERLESS HARVEST AREA)

Estimates include number of individual moose, density, and age-sex composition ratios. The survey methods refer to Gasaway random stratified block (RSB) and distance sampling methods (DS).

Survey year	Survey method	Population size (90% CI)	Density (/km ²)	Ratio to 100 females	
				Males	Juveniles
2006/07	RSB	1102 (880-1324)	0.40	48	40
2008/09	RSB	874 (650-1097)	0.32	41	35
2012/13	DS	1340 (1104-1629)	0.43	64	40
2015/16	DS	1192 (747-1901)	0.41	34	55
2022/23	DS	1456 (1185-1790)	0.50	29	16

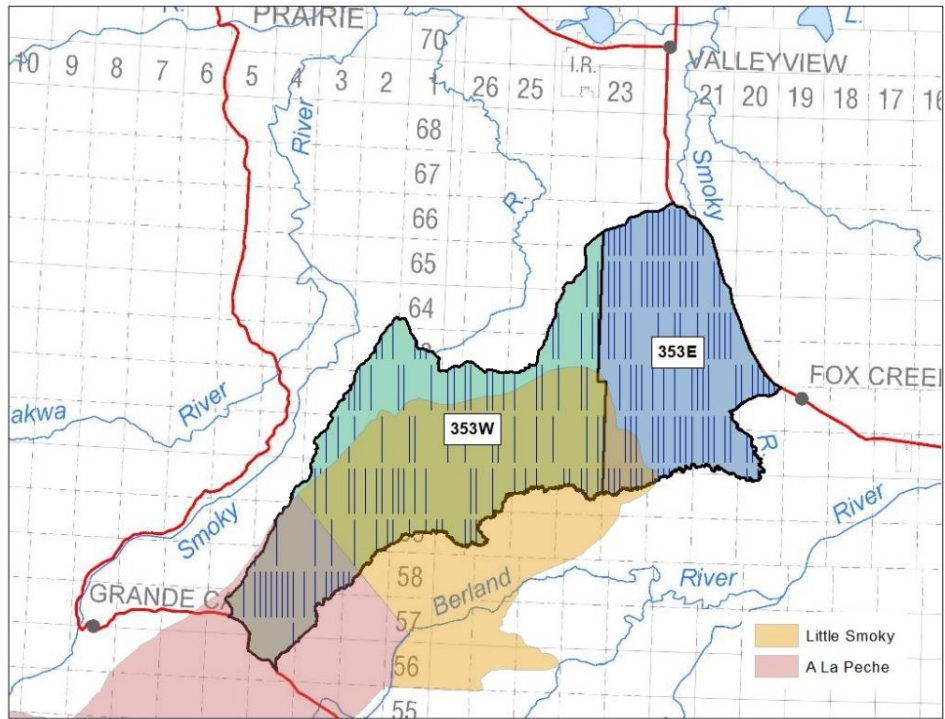


FIGURE 1. Map of WMU 353 depicting the transects flown. 353W (green) represents the portion of the WMU which includes an Antlerless Harvest Zone where the WMU 353 antlerless moose special license is available. Little Smoky and A La Peche represent two caribou zones within west-central Alberta.

Literature

Alberta Environment and Parks. 2016. Aerial Ungulate Surveys using Distance Sampling Techniques – Protocol Manual.

Buckland, S.T., D.R. Anderson, K.P. Burnham, J.L. Laake, D.L. Borchers, and L. Thomas. 2001. Introduction to Distance Sampling: Estimating Abundance of Biological Populations. Oxford University Press, Oxford, UK.