Aerial Wildlife Survey Report

Wildlife Management Unit 522 Aerial Ungulate Survey (2020)

Background

Wildlife Management Unit (WMU) 522 is located in west-central Alberta, covering an area of 3257 km^2. The unit is bordered by the Peace River Valley to the north, the Smoky River to the east and south east, and Highway 2 to the west. The habitat is dominated by agricultural cropland interspersed with dry mixed wood vegetation.

An aerial survey for moose and deer was last conducted in 2004 using random stratified block (Gasaway) methods. The goal of this year's (2020) survey was to assess the status of moose and deer since the last survey in 2004. Specific objectives were to determine a population estimate, population ratio for sex and age classes, and a density estimate for moose and deer in WMU 522. An additional objective was to provide a baseline population assessment of elk by means of directed total counts.

Survey method

An aerial survey for moose, deer and elk in WMU 522 was conducted from January 20th to 24th, 2020. Distance sampling methods (Buckland et al., 2001) were used to determine moose and deer population and density estimates. Distance sampling transects (n = 457), up to 10 km in length and oriented north-south, were established throughout the unit with 1.2 km spacing. A random sample (n = 196) of available transects was flown. The unit was stratified into 2 strata: River Valley (including a 2000m buffer from the top of break); and Non-River Valley strata. Additional transects were assigned in the River Valley stratum to improve the precision of estimates for both species of deer. Moose and deer were classified by age (adult or young) and sex.

Traditional sampling methods do not reliably estimate elk densities because elk populations are highly clumped. Therefore, while all elk observed during the distance sampling transects are classified and counted, an additional dedicated survey to locate uncounted elk groups was flown to improve the minimum total counts. This additional effort focused on areas where elk have been observed (e.g. tracks or crop damage) or within high quality habitat that were not surveyed during the transects.

Results

All available transects were flown for a total survey effort of 1052 km and 33.5 hours flying time. In total, 750 moose were observed from 449 independent groups. Of the 745 moose that were successfully classified, 367 were cows, 168 were calves and 210 were bulls. Of the bulls observed, 46% had already shed their antlers. Of the bulls still with antlers, 51% were small (small spike or forked antlers), 46% were medium (small palmated antler 'paddles') and 3% were large (large palmated antlers with minimum 3 points to the front with a spread more than half the body length). The bull:cow and calf:cow ratios were 0.57 and 0.46, respectively. The density estimate was 1.16 moose/km^2 with a coefficient of variation of 8%. The estimated moose population for WMU 522 is 3780 (90% CI 3317 - 4307). See Table 1 for a comparison to previous survey results.

During this sampling effort, we also observed 662 mule deer from 156 independent groups. Of the 639 mule deer that were successfully classified, there were 297 does, 195 fawns and 147 bucks. Of the bucks observed, 42% were small (1 or 2 points), 35% were medium (3 or four points on at least one antler) and 23% were large (at least 4 points, with an antler spread beyond the ears). The buck:doe and fawn:doe ratios were 0.49 and 0.66

respectively. The density estimate was 0.92 mule deer/km^2 with a coefficient of variation of 19%. The estimated mule deer population for WMU 522 is 2987 (90% CI 2198 - 4061). See Table 2 for a comparison to previous survey results.

We observed 245 white-tailed deer from 73 groups. Of the 243 that were successfully classified, there were 107 does, 89 fawns and 47 bucks. Of the bucks observed, 40% were small (1 or 2 points), 47% were medium (3 or four points on at least one antler) and 13% were large (at least 4 points, with an antler spread beyond the ears). The buck:doe and fawn:doe ratios were 0.44 and 0.83 respectively. The density estimate was 0.58 white-tailed deer/km^2 with a coefficient of variation of 21%. The estimated white-tailed deer population for WMU 522 is 1895 (90% CI 1254 - 2863). See Table 3 for a comparison to previous survey results.

A total of 1824 elk in 88 groups were observed from transects and focused search flights (an additional 13.9 hours flying time). Of the 1731 elk that were successfully classified, 1004 were cows, 499 were calves and 228 were bulls. Of the bulls observed, 45% were small (1 or 2 point), 44% were medium (3 to 5 point) and 11% were large (six point or greater). At this time of year, most bull elk still have antlers so these proportions should be representative of the population post-hunting season. The bull:cow and calf:cow ratios were 0.23 and 0.50, respectively.

Table 1. Comparison of current and previous moose survey estimates for WMU 522. Estimates include number of individual moose, density and age-sex composition ratios. Random stratified block and distance sampling methods have been used.

Survey Year	Survey Method	Abundance Estimate Mean (90% CI)	Density Sq. km (90% CI)	Bull:Cow (90% CI)	Calf:Cow (90% CI)
2000	Random Stratified Block	1418 (1262 - 1572)	0.44 (0.39 – 0.48)	0.15	0.32
2004	Random Stratified Block	3251 (2637 - 3865)	1.00 (0.81 - 1.19)	0.32 (0.29 - 0.35)	0.45 (0.41 - 0.48)
2020	Distance	3780 (3317- 4307)	1.16 (1.02 - 1.32)	0.57 (0.48 - 0.66)	0.46 (0.41 - 0.51)

Table 2. Comparison of current and previous mule deer survey estimates for WMU 522. Estimates include number of individual mule deer, density and age-sex composition ratios. Random stratified block and distance sampling methods have been used.

Survey Year	Survey Method	Abundance Estimate Mean (90% CI)	Density Sq. km (90% CI)	Buck:Doe (90% CI)	Fawn:Doe (90% CI)
2000	Random Stratified Block	2345 (2057 - 2633)	0.72 (0.63 – 0.81)	0.27	1.16
2004	Random Stratified Block	3467 (2805 - 4128)	1.08 (0.86 - 1.27)	0.56 (0.51 - 0.60)	1.19 (1.13 - 1.25)
2020	Distance	2987 (2198 - 4061)	0.92 (0.67 - 1.25)	0.49 (0.39 - 0.60)	0.66 (0.58 - 0.73)

Table 3. Comparison of current and previous white-tailed deer survey estimates for WMU 522. Estimates include number of individual white-tailed deer, density and age-sex composition ratios. Random stratified block and distance sampling methods have been used.

Survey Year	Survey Method	Abundance Estimate Mean (90% CI)	Density Sq. km (90% CI)	Buck:Doe (90% CI)	Fawn:Doe (90% CI)
2000	Random Stratified Block	419 (345 - 493)	0.13 (0.11 - 0.15)	0.36	1.20
2004	Random Stratified Block	790 (630 – 950)	0.24 (0.19 - 0.29)	0.49 (0.42 - 0.56)	1.12 (1.03 - 1.21)
2020	Distance	1895 (1254 - 2863)	0.58 (0.39 - 0.88)	0.44 (0.24 - 0.64)	0.83 (0.74 - 0.92)

Literature

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.