2010 Wildlife Management Unit 351 moose

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Historically, moose populations in WMU 351 were surveyed following Alberta's Northern Moose Management Program protocol (Lynch 1997) in the winters of 1993/94, 1997/98, and 2001/02. Alberta Fish and Wildlife strives to complete surveys in each WMU at a minimum of every 3 years or when land and wildlife management issues necessitate increased monitoring and assessment of populations and their distribution. WMU 351 receives substantial hunting pressure from First Nations and Metis communities and is also a highly desirable unit for recreational hunters given historical moose populations in the unit, ease of access, and relative proximity to major urban centres. Therefore, regular moose surveys in WMU 351 are important to assess moose population status and trends, in order to properly manage the resource. This report

contains the results of the moose survey conducted in WMU 351 in the winter of 2009/10.

Study area

WMU 351 is delimited to the north by the southern boundaries of townships 71 and 72; to the west by the western boundaries of range 18 and 19 and the northern boundary of township 69; to the south by the main tributary of the Goose River and the Goose Forestry Tower Road; and to the east by Highway 33 (Figure 1).

This WMU has few small lakes and ponds, however, it is characterized by an abundance of creeks and rivers. The Goose and Swan rivers and their tributaries are the major flowing waters in the WMU. The land base in WMU 351 is composed of the lower and upper foothills natural subregions at higher elevations, with portions of the central mixedwood natural subregion at lower elevations (Natural Regions Committee 2006). Much of the WMU is highly fragmented with logging cut blocks and hauling roads. This is especially true of the western half of the WMU and the region northwest of Swan Hills. Footprint from the oil and gas industry is omnipresent on the landscape and is especially prevalent around the headwaters of the Swan, Moosehorn, and Inverness rivers northwest of Swan Hills, as well as in the southwest corner of the unit north of the Goose River.

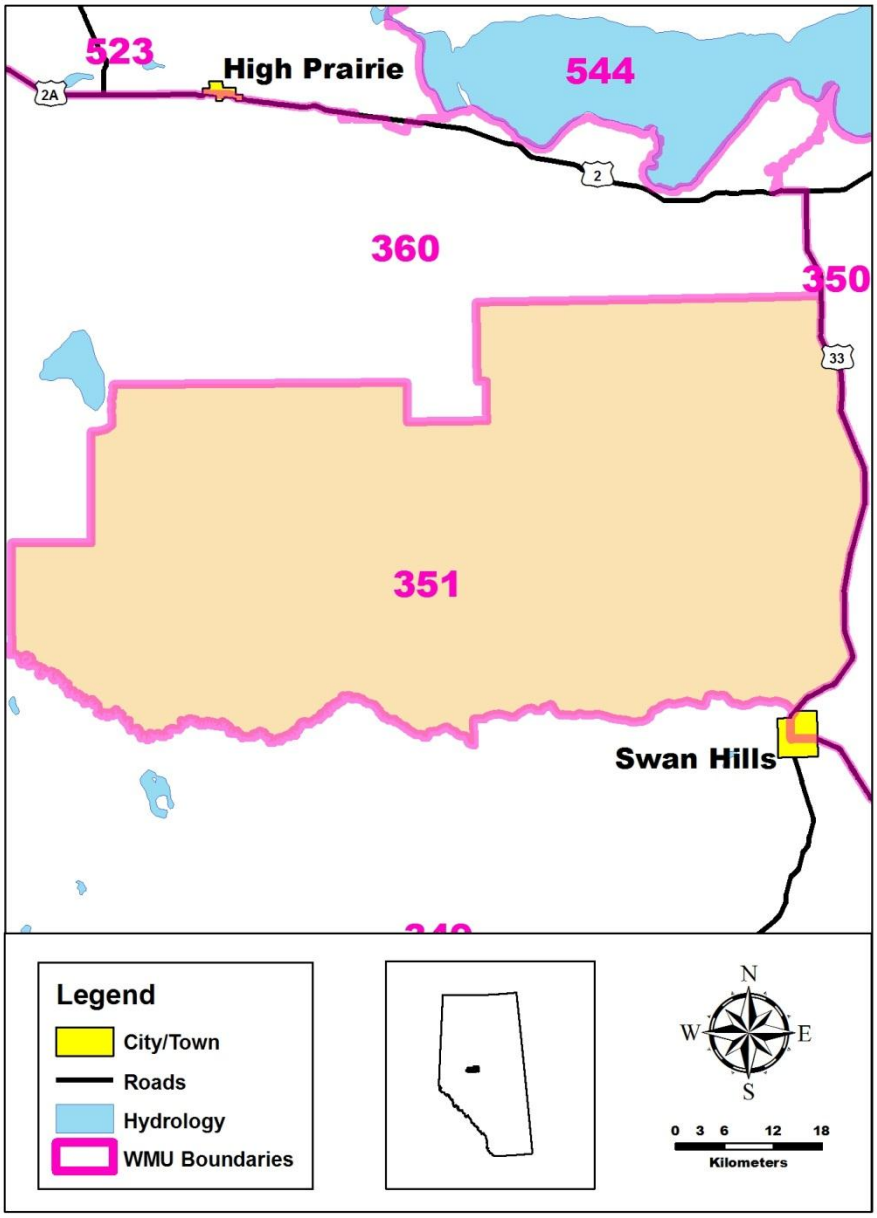

Figure 1. Location of Wildlife Management Unit 351 in Alberta.

Survey methods

An aerial ungulate survey following methodology adapted from the Gasaway survey technique (Gasaway et al. 1986), as described in the Northern Moose Management Program Moose Survey Field Manual (Lynch 1997) and the ASRD-AUS protocol manual (ASRD 2010), was conducted in February, 2010. A Cessna 185 and Cessna 206 fixed-wing aircraft, each with a crew consisting of a pilot and three observers, were used for the stratification flights on 1 - 2 February 2010. Stratification crews in each aircraft flew east-west transects across the WMU at one minute of latitude intervals skipping latitude lines at 5 minute intervals. Air speed during stratification flights was approximately 150 km/h, and flight altitude was maintained between 60 - 90 m above ground level (AGL). Locations of moose were marked using a Garmin GPSmap 60CSx.

The WMU was then divided into low, medium and high density blocks (measuring 5 minutes longitude x 5 minutes latitude) based on moose densities observed during the fixed-wing stratification flights. As a result, 20 blocks were classified as low, 53 as medium, and 19 as high, for a total of 92 blocks. A random sample of five blocks from each stratum was initially selected for intensive moose surveys. Two Bell 206B helicopters were used to assess the number of moose within each of the intensive survey blocks on 3 - 8 February 2010. Each block was flown east to west on flight lines spaced approximately 400 m apart at speeds of 80 - 110 km/h and an altitude of 45 - 75 m. Flight crews consisted of one pilot and three observers on all flights. Based on the analysis of the results when all initial blocks had been flown, an additional four medium and one high block were randomly selected and surveyed to reach our precision target of less than +/- 20% for a 90% confidence limit.

All moose were classified as bulls, adult cows with or without calves, lone calves, or unclassified. Bull moose still retaining their antlers were further classified into size classes based on antler development (Table 1). 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.

A fresh snowfall of 2 - 5 cm on top of older snow was initially judged to be adequate for aerial survey purposes, but was not ideal. Snow depths were less than 30 cm over much of the unit, with the exception of higher elevation low density pine stands where snow depth was approximately 50 cm. Flying conditions throughout the stratification were excellent with no

turbulence, flat light, and good visibility. Winds were generally calm (0 - 10 km/h) and skies were 100% overcast. Snow condition deteriorated progressively throughout the intensive surveys such that south facing slopes and benches, as well as the base of conifers at lower elevations were often bare of snow. Low ground fog on 3 – 4 February and on the morning of 5 February prevented crews from flying. However, flying conditions for the reminder of the survey were excellent with little to no turbulence, good visibility, generally calms winds (0 - 10 km/h) and clear skies.

Results

After intensively flying 18 sample units, the Quadrat Survey Method Program generated a moose population estimate of between 1,803 and 2,411 (Table 1). Of the cows and calves observed during detailed block surveys, 55.7% were single cows, 43.3% were cows with a single calf, and 1.0% were cows with twins, for an observed twin rate of 2.2%. Of the observed bulls, 93% had already shed their antlers (80 out of 86 observed bulls). Therefore no inferences regarding the distribution of bulls by antler class can be made. Two medium stratum blocks were removed from the analyses due to discrepancies between stratification and intensive survey observations. Localized movements of moose that were concentrated near survey unit boundaries may have caused such discrepancies. With consideration of these factors, we present results both with and without the two additionally survey blocks. Based on results from 20 sampled units, the Quadrat Survey Method Program estimated a moose population of between 1,535 and 2,199 (Table 1).

Table 1. Comparison of aerial survey results for moose in Wildlife Management Unit 351 from 1994 – 2010.

Year	Population Estimate (90% confidence limits)	Moose/km^2	Ratio to 100 Females	
			Males	Juveniles
2010 – 18 units	2,107 (±14.5%)	0.48	41	46
2010 – 20 units	1,867 (±17.8%)	0.43	42	45
2002	2,457 (±10.5%)	0.56	32	45
1998	2,451 (±19.2%)	0.56	42	28
1994	2,152 (±16.5%)	0.52	19	53

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