

**Aerial Survey for Bighorn Sheep (*Ovis canadensis*) in
Winter Mountain Ranges
December 4th 2010**

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ABSTRACT

A bighorn sheep survey was conducted on December 4th 2010 on 6-7 of 16 known winter ranges within Wildlife Management Units (WMU's) in the Clearwater area: 418, 420, 422, 426, 428, 432, and 434. Weather conditions were good for visibility (bright light) and wind (calm), although snow coverage was fair to poor, with patches of grounds not completely covered by snow. A total of 5 hr, 40 min of helicopter time were used to complete the survey. A total of 712 sheep were observed, consisting of 353 ewes, 181 lambs, 128 rams (22- ¼; 41- ½; 50 ¾; 14- 4/5 or full curl; and 1 unclassified ram), and 50 unclassified sheep; 2% of the total sheep were classified as trophy (4/5 or full curl). Herd composition was 36.3 rams: 100 ewes: 51.3 lambs:. Elk observations were recorded at the same time because many sheep wintering areas are found near elk wintering habitats. A total of 152 elk were seen during the survey.

Introduction

Bighorn sheep (*Ovis canadensis*) are one of the most prized of Alberta's wild ungulates because of their appearance, size, large horns, and social behaviour. With continued growth of the human population and activities, public interest regarding sheep has become numerous and diversified (Fish & Wildlife Division, 1993). Bighorn sheep are highly valued for the hunting and viewing opportunities they provide.

As part of regular monitoring of wildlife populations in the province, biologists conduct aerial surveys each winter and collect information on population dynamics, behaviour, distribution, and habitat choice for various game species. Depending on the species and on the terrain, these surveys are conducted on a 5 - 7 year rotation per Wildlife Management Unit or on a 2 - 3 year base for species on winter ranges. In 1986, a systematic winter range aerial trend survey for bighorn sheep was initiated in the Clearwater area, in the Eastern portion of the foothills. Since this time, surveys have been conducted every 2 years over the same winter ranges in order to monitor the spatial distribution, post-hunt herd composition and trends in population size. The great advantage of aerial surveys is that a big portion of territory, often remote or difficult to access, can be surveyed accurately and efficiently in a relatively short period of time and population trends can be effectively determined from the survey results (Gasaway et al, 1986).

The purpose of this report is to summarize the results, such as minimum count, population trends, herd composition, and spatial distribution, obtained for the survey conducted on December 4th 2010. The comparison with previous surveys might not be accurate and results shall be interpreted carefully because the time of the year is different from previous surveys and because only a portion of the winter ranges were flown.

Study Area

Bighorn sheep winter ranges in the Southwest Region 2 are located on the west portion of the Clearwater area, bordered to the west by Banff and Jasper National Parks,

to the North by the Yellowhead and Brazeau Counties and to the South by the Panther and the Dormer-Sheep FLUZ. There are 16 sheep winter ranges identified within this area. The 2010 survey covered 6 of these winter ranges completely; a seventh winter range was partially completed (Wapiabi) (Fig.1). The area consists predominantly of upper foothills, montane, and subalpine habitats (from east to west respectively), with several large river valleys characterized by riparian habitats and meadows. The area includes some unique habitat: fescue grassland (Ya-Ha Tinda) in the most SW portion, a plain characterized by mild winters (Kootenay Plains), and an extensive forested area (R11) with no timber allocations. In the R11 Forest Management Unit, several prescribed burn plans have been approved. The intent of using prescribed fires as a management tool is to conduct vegetation management activities to bring the age classes closer to natural ranges and enhance wildlife habitat particularly for sheep and elk. There is very little agriculture or human settlement, and forestry and energy extraction activities are limited, although the level of human pressure related to recreational facilities in the area is steadily increasing.

Methods

The historic sheep winter ranges surveys were flown intensively by a helicopter (A-star); presence of sheep tracks initiated more detailed coverage of an area. All observed sheep were counted and a GPS location taken; males were identified, where possible, following the classification used for the provincial standard: $\frac{1}{4}$ curl, $\frac{1}{2}$ curl, $\frac{3}{4}$ curl and legal ($\frac{4}{5}$ curl and full curl). Lambs were identified by their smaller size. It was not always possible to distinguish yearling, 2-year old and yearling males; in these case, they were included in the 'ewe' category. Elk encounters were identified by a GPS location and classified by sex and age, whenever possible. Air speed during flights was approximately 70-80 mph at an altitude of 2000 meters above ground. The flight crew consisted of a pilot and four passengers: a navigator/observer in the front, and two experienced observers in the back. Because the unique circumstances of this survey, only 6 of the known winter ranges were flown. Ranges within Banff National Park were marginally surveyed while ranges within Jasper National Park were not surveyed at this time.

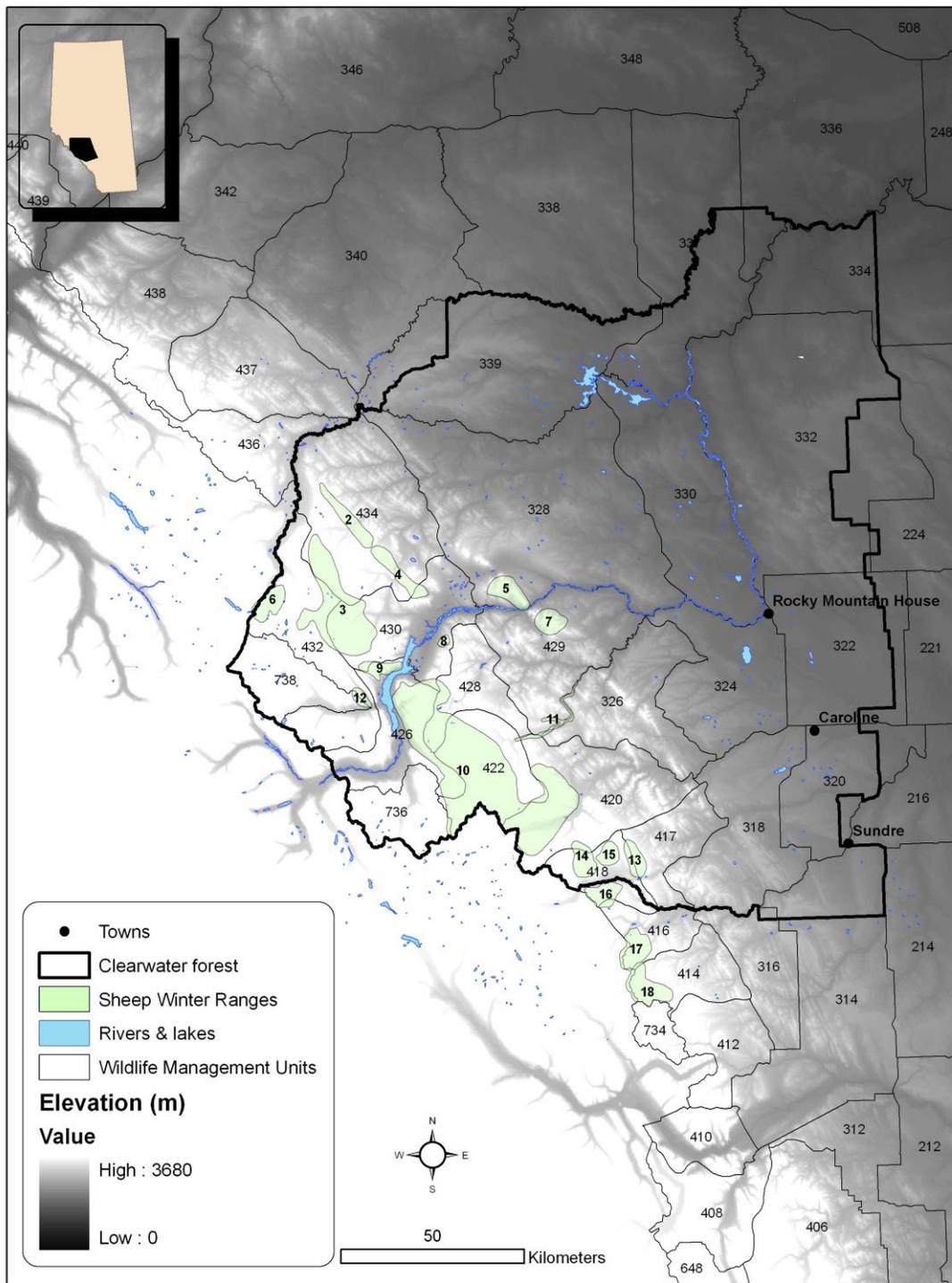


Figure 1: Known Bighorn Sheep winter ranges in the Clearwater Area, Alberta.

Results

This survey was conducted on December 4th 2010. During the survey, flying conditions were good, with high visibility and no wind. The observing conditions however, were fair because of the bright light and the patchy snow coverage. A total of 5 hrs, 40 min were flown.

We observed 712 sheep on 6 winter ranges (Table1; Fig 2). Some observations were outside the known winter ranges, particularly in WMU 420 and 432; this could be because of the mild winter conditions at the time of the survey or the early time of year the survey was flown. During the survey, 353 ewes, 181 lambs, 128 rams, and 50 unclassified sheep were seen. Rams were classified as 22 ¼ curl, 41 ½ curl, 50 ¾ curl, 14 4/5 or full and 1 unclassified male (Table 1). The herd composition was 36.3 rams: 100 ewes and 51.3 lambs: 100 ewes. 2% of the total sheep that were classified as 4/5 or full curl.

Table 2: Composition of bighorn sheep observed (minimum counts) during the December 4th 2010 aerial survey.

WMU	1/4 curl	1/2 curl	3/4 curl	legal	U/c male	Ewes	Lambs	u/c fem	u/c sheep	Wmu subtot
418	0	2	2	1	0	9	6	0	0	20
420	9	17	19	5	1	110	73	20	2	256
422	6	6	5	2	0	73	42	11		145
426	1	1	3	1	0	12	4	1		23
428	1	1	2	0	0	17	12	1		34
432	1	4	5	1	0	39	12	7		69
434	2	6	8	3	0	68	23	1	1	112
738	1	3	4	0	0	19	6	6		39
BNP	1	1	2	1		6	3			14
Totals	22	41	50	14	1	353	181	47	2	712

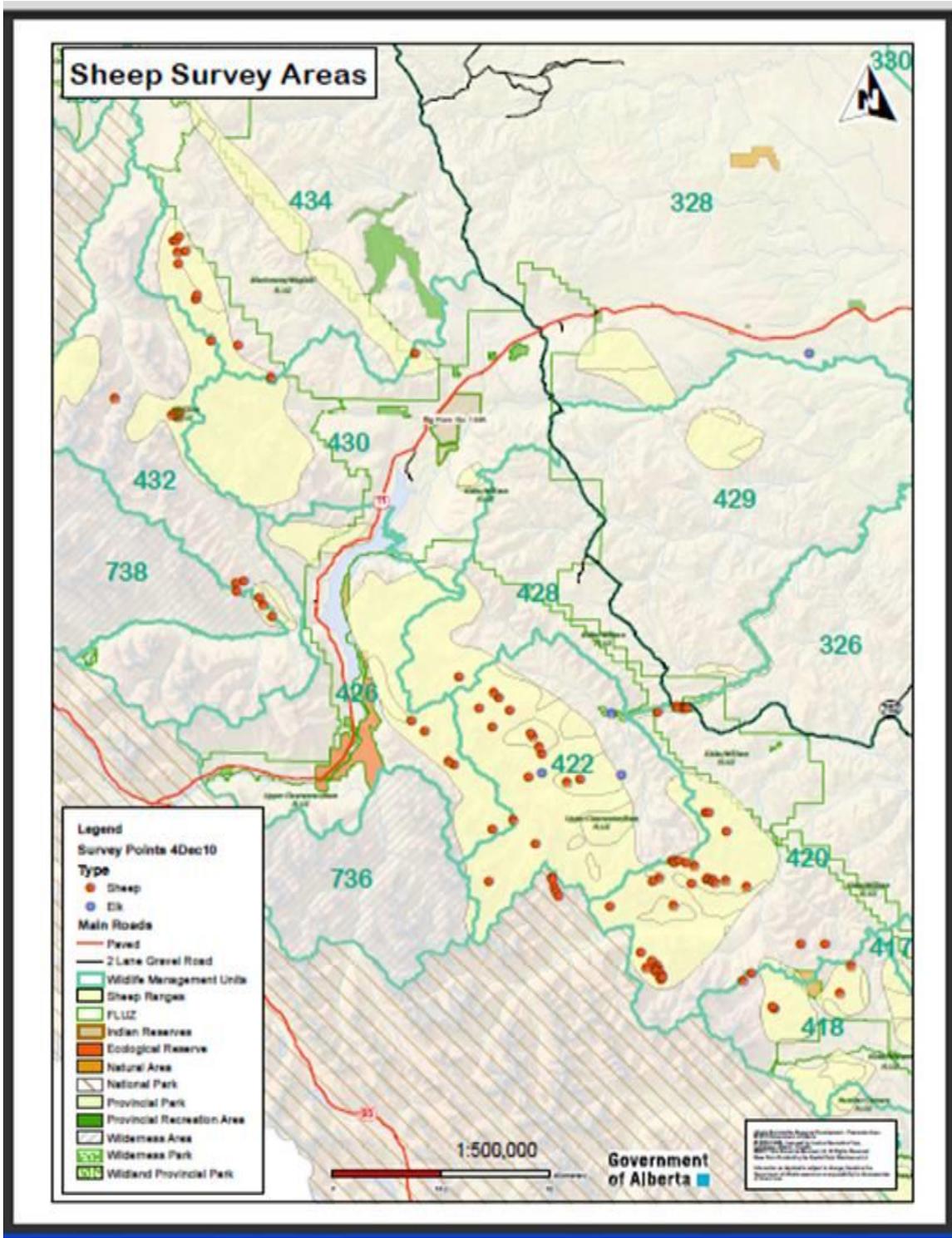


Fig. 2: Locations of Bighorn sheep and elk sightings during the Dec. 4, 2010 in the Clearwater area, Alberta.

Discussion

The total number of sheep observed during this survey (712) was low compared to previous surveys in 2005 (1482), 2007 (1072) and 2009 (1491). This is to be expected given that several winter ranges were not flown at this time and snow conditions were only fair.

The lamb: ewe ratio from this survey (51 lambs: 100 ewes) is not unexpected for pre-winter surveys. This ratio is however high compared to surveys conducted between January – March in 2005 (32 lambs: 100 ewes), 2007 (30 lambs: 100 ewes) and 2009 (24 lambs: 100 ewes). Lamb survival generally declines as the winter progresses and resources become scarce, and the earlier timing of the 2010 survey may explain these results. High precipitation levels in the summer of 2010 may also have increased forage production and lamb survival. A second survey in January or February of 2010 should help to explain the higher lamb: ewe ratios in Dec. 2010 compared with previous years.

The ram: ewe ratio from this survey (36 rams: 100 ewes) was the same as in 2007, but was low compared to 2005 and 2009 surveys (45-46 rams: 100 ewes). A ratio of 36 rams: 100 ewes is within the lower range of values for a stable population.

The percentage of trophy rams in this 2010 survey was approximately 2%. This is well below the target value of $\geq 5-6\%$. Since 1995, the percentage of legal rams has been less than 5%.

Literature Cited

- Fish and Wildlife Division. 1993. Management Plan for Bighorn Sheep in Alberta. Alberta Environmental Protection, Fish and Wildlife Services, Edmonton.
- Gasaway, W.C., D. DuBois, D. J. Reed, and S. J. Harbo. 1986. Estimating moose population parameters from aerial surveys. University of Alaska, no. 22.