

Recommended Land Use Guidelines for Mountain Goat and Bighorn Sheep Ranges in Alberta

Introduction and Rationale

Mountain goat and bighorn sheep are alpine ungulates that react to predator/human disturbance by running to escape terrain typically consisting of cliffs and very steep slopes. The majority of goat and sheep ranges in Alberta are contained in Prime Protection Zones (Zone 1) where industrial activity is not permitted (A Policy for Resource Management of the Eastern Slopes 1977, revised 1984). However, there are a number of ranges that fall within the 'Critical Wildlife Zone' (Zone 2) designation (initially under the Eastern Slopes Policy and subsequently under various Regional and Sub-Regional Integrated Resource Plans). In these areas, the intent "is to protect ranges of terrestrial and aquatic habitats that are crucial to the maintenance of specific fish and wildlife populations".

Every effort should be made, within identified critical goat and sheep ranges, to: a) avoid land use disturbances that may have a direct or indirect adverse effect on the behaviour of the animals, and b) avoid permanent alteration of physical habitat conditions. The potential for significant direct effects on sheep and goat populations will vary with time of year and the total amount and duration of various land use activities. Of particular concern is low level aircraft activity (particularly helicopters) and any disturbances during the spring and early summer lambing and kidding period. Localized steep cliffs, that are likely to be used as escape terrain, should be given particular protection.

Research in Alberta involving heart-rate telemetry on bighorn sheep (MacArthur *et al* 1982; Stemp 1983) demonstrated negative responses to helicopter overflights. MacArthur *et al* (1982) recorded heart rate responses when helicopters were within 400 m and direct overflights at 90-250 m above ground level resulted in significant responses in terms of level and duration of heart rate and the observation of animals running to escape terrain. Stemp (1983) documented much greater responses to helicopters with repeated overpasses producing sustained anxiety for several hours. Stemp (1983) recommended avoiding helicopter use in and near to bighorn sheep range and restricting any flights to corridors and overflights to > 400 m above alpine terrain.

Cote (1996) studied the impact of geophysical helicopter activity on mountain goats on Caw Ridge, near Grande Cache, Alberta. This paper has become the definitive reference dealing with the effects of repeated helicopter activity on mountain goats in North America. The author recommends a 2000 m buffer between mountain goats (i.e. treeline) and intensive helicopter activity (i.e. heli-portable geophysical programs). Recently, this strategy has successfully been used to define limits for heli-hiking proposals in south-eastern British Columbia and for mineral exploration in Alaska.

The above-noted research findings from several ranges in Alberta, in combination with a significant increase in heliportable geophysical proposals (particularly 3-D programs) in

proximity to mountain goat and bighorn sheep ranges, has led to the development of this 'Provincial Land Use Operating Guideline'. The following specific guidelines are intended to be **minimum requirements for industrial land use activities** within, and adjacent to, identified goat and sheep ranges. Additional or different requirements may be applied where:

- a) Particularly unique conditions exist, such as at the Pinto Creek Goat Range north of Hinton, which is in a predominantly forested area.
- b) Unusually adverse weather conditions exist at the time of the proposed activity.
- c) Particularly critical habitat elements (e.g., cliffs providing escape terrain and mineral licks) occur within local portions of the identified range and require additional protection from industrial activity.
- d) Other types of land use activities are prevalent, such as heli-supported tourism, and potential cumulative impacts are a particular concern.

Guidelines

1. The **goat/sheep land use zone** shall apply to industrial land use activities within and adjacent to identified critical sheep and goat ranges.
2. The 'goat/sheep land use zone' includes all of the mapped critical sheep and/or goat range, plus an additional 800 m buffer around the range.
3. Industrial activity, within a 'goat/sheep land use zone', whether ground or air based, is to occur only between July 1 and Aug. 22, inclusive. [This is designed to avoid disturbance during the spring lambing/kidding season, land use conflicts with hunters during the late summer/fall big game hunting season in alpine areas, and stresses on animals restricted to localized areas during the critical winter season.]
4. Geophysical exploration (seismic) activity may be permitted within a 'goat/sheep land use zone' during the open window period of July 1 to Aug. 22 under the following conditions:
 - a) No more than one (1) composite program¹ within a particular 'goat/sheep land use zone' in any given year, and
 - b) No more than one third of a particular 'goat/sheep land use zone', comprised of a contiguous block, is to be available to geophysical exploration during a given year.
5. Where helicopter support is required for an approved seismic program within a portion of a 'goat/sheep land use zone', flight paths to and from the approved activity area should avoid all steep cliff faces that may be used as escape terrain, as well as other known high use areas, such as mineral licks. A qualified biologist, who is knowledgeable and experienced with mountain goats and bighorn sheep in field situations, should be hired by the exploration company to monitor the location and

¹ A composite program for geophysical exploration would be a combined and co-ordinated seismic operation involving all private industry interests who want to conduct geophysical exploration within a designated goat/sheep land use zone during a particular year. Development of the composite program would require notification to Alberta Sustainable Resource Development by May 15th at the latest, so that companies could be put in touch with each other to develop a common program which would cover no more than one third of a given sheep/goat range, as a contiguous block, in any one year.

activity of sheep and/or goats within the land use zone. The monitoring activity is to be used to redirect or temporarily curtail exploration activities in the interest of minimizing disturbance to the animals, as well as to provide them with an opportunity to move into portions of their range that are not being actively explored.

6. All aircraft (helicopter and fixed-wing) flights over the 'goat/sheep land use zone' should be at least 400 m above ground level (agl), except where specifically authorized, within the intent of these guidelines.
7. No **new** ground access should be developed within the 'goat/sheep land use zone'. For those alpine ranges that currently have access, quad-supported ground crews should remain on existing exploration trails.
8. The drilling of exploration wells to prove up promising formations beneath 'goat/sheep land use zones' should be done from outside of the 'zone' using directional drilling technology, wherever feasible. Should any wells and other associated infrastructure be developed within the 'goat/sheep special management zone', road access should be designed for temporary use, and usage should be strictly controlled by locked gates and regular monitoring. Operations should involve remote technology to the fullest extent possible.

Approval Process: Roles and Responsibilities

The areas where these conditions apply will be illustrated on regional wildlife land use referral maps. The standard approval process will continue to be used.

Emergency Situations

It is recognized that in emergency situations (injuries, illness) that these helicopter restrictions will not apply.

Literature Cited

- Cote, S.D. 1996. Mountain goat responses to helicopter disturbance. *Wildlife Society Bulletin*, 24(4): 681-685.
- MacArthur, R.A., V. Geist and R.H. Johnston. 1982. Cardiac and behavioural responses of mountain sheep to human disturbance. *J. Wild. Manage.* 46(2): 351-358.
- Stemp, R.E. 1983. Heart rate responses of bighorn sheep to environmental factors and harassment. M. Env. Design. Univ. of Calgary. 314 pp plus Appendices