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My main points in sheep management are:

1. The need to conserve unhunted and unmanaged populations of sheep of all races, and ecological types. Thus we need a viable Stone's sheep population under protection. Next, we need not only high-mountain populations under protection but also some lowland sheep, i.e. such as in cliff belts along major rivers, such as the Yukon. These small, but viable populations would be our insurance against mismanagement, since they represent untapped information and a reserve of animals for reintroduction programs.
2. The need to keep unmanaged, unaltered, natural populations in our National Parks so that we can inform ourselves on how the ecological parameters of the habitat translate into the sheep's population dynamics, growth, physiology and behaviour. Sheep that graze fertilized roadbanks and lawns, are fed and salted by tourists, whose population is reduced by trapping programs and highway traffic, do not fit the requirements.
3. Once these requirements are satisfied, we can manage and experiment with new management concepts on populations used for hunting or for recreational, aesthetic, etc. needs, in good conscience.
4. A desirable objective is to rehabilitate areas from which sheep were eradicated in earlier years. This applies to large areas in the Yukon Territory where market hunting destroyed sheep populations.
5. I emphasized that in dealing with social animals we must not apply our knowledge gained from moose or deer, since their adaptive strategies differ too greatly.

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Is sheep management in Alberta affected by the presence of National Parks? Obviously the answer is yes, after looking at the relationship of winter sheep ranges on the East Slope to the location of the Park boundary.

Alberta East Slope Bighorn Range - 50 miles x 450 miles with half in the National Park. But, most (60-70%) of the winter ranges in the Province are within 10 miles of the boundary. There is, therefore, a very marked movement of sheep: Park in summer, outside Park in winter. But the number and availability of winter ranges is the key to bighorn survival and population numbers.

This relationship is important as there has been a tremendous change in sheep numbers in the last Century (well documented by John Stelfox).

Very generally:

- 1800 - 1866 - high, 10,000 sheep
- 1860 - 1915 - decline, 2,600 sheep due to heavy hunting and livestock competition
- 1915 - 1936 - rapid increase to 8,400 sheep through protection
- 1937 - 1950 - high density and rapid decline - 2,500 sheep not synchronous decline over East Slopes but decline of 75 per cent in Parks - identifying of pneumonia lungworm - relation weather and range.
- 1950 - 1966 - rapid increase, 10,000 sheep - good range, mild winters. Scattered die-offs in Banff - Bow River
- 1966 - 1970 - high, but potential for die-off - first showing in the East Kootenay and then Kootenay Park in B.C. due to the pneumonia - lungworm complex and the weather and range conditions. The incidence of lungworm is now low there; however, very high in Jasper and Banff Parks and a decline is predicted.

Outside Parks winter surveys 4,500 sheep - ranges generally fair (incidence of lungworm relatively low), but relatively low production - December 30%; lambs per 100 ewes and yearlings and 2 year olds.

We can accept the philosophy that the population declines in the Parks are natural, but how can we reduce the very real possibility of an effect on adjacent or mutual herds? - with the apparent virulent condition.

Here then is the problem:

1. a mutual herd, partially in the Park (unhunted) and Provincial (hunted), but with considerable movement between.
2. the build-up in sheep populations - perhaps fluctuating between 10,000 - 2,500 in response to range conditions, weather severity and a lungworm - pneumonia complex and with additional stresses including range competition and a lack of predation.

We are at the peak in sheep populations and we are expecting a decline. What are we doing? Look at our present management outside the Park:

1. Trophy Sheep Seasons:
 - originally none, then a minimum 3/4 curl in the early 1960's to 4/5 curl in 1968
 - November seasons were initiated for a short time to catch Park rams
 - 1,200 residents and 200 non-residents = 110 rams killed
 - about 1/3 of the legal rams
 - a reduction from past kills - mid 1960's with November season over 200 rams.

However, with trophy sheep seasons - only one small segment - rams 6 years and over - affects 5% of population.

2. Non-Trophy Sheep Seasons:
 - initiated in 1966 to reduce sheep populations in order to maintain a lower population level and to increase production. A recent modification was made to protect yearling rams and lambs. The attempt to reduce population on a range basis, is not effective.

- 400 - 450 permits - kill up to 150 sheep (kill probably 5% of the population and therefore not effective in population control).
- 3. Reduction of Elk and Livestock Competition:
 - late 1950's - introduction of cow elk seasons
 - a gradual reduction in livestock grazing in key areas
 Both these methods only allow more range and less competition for available grass. A short term solution allowing higher carrying capacity for bighorns.
 - estimated loss of elk range at 7% every 10 years.

In Summary: we have a sheep population above or reaching its carrying capacity and although very "refined", sheep management can not retain a desired population level.

What can we do to maintain a high sheep population in Alberta outside of the Parks? - raising rams and yet maintaining adequate production

1. Kill a higher number of non-trophy sheep and maintain a lower population level. Very difficult when there is no demand for present non-trophy licences. It is unpalatable for many sheep hunters, perhaps epidimizing trophy hunting, to kill a ewe at 25 yards.
2. A late sheep season in November to kill more rams and ewes when they are on specific winter ranges. This may delay migration and even breeding behaviour. Unless there are more non-trophy hunters, there would not be a significant increase in the harvest.
3. Same number of non-trophy permits - but only few W.M.U.'s per year - heavy harvest on specific herds.
4. Ray Demarchi - "slaughter house" syndrome in Europe.
5. Remove all competition for bighorn sheep on ranges - more liberal cow elk seasons and elimination of livestock from many allotments.
6. Improving present sheep ranges by burning and fertilizing - but, range improvements only temporarily resolve the problem and only in specific areas due to the animals' innate capacity to increase above their carrying capacity.
7. Protecting predators and allowing their build-up is essential. They alone may maintain a stable population or at least smooth out violent oscillations. But predators are protected in the Parks and have had no effect in Park sheep populations.
8. Possibly the best solution - let any die-offs occur - best for solving land-use problems.

I feel our management may, and certainly could help maintain a more desired level of sheep outside the National Parks. However, we can expect declines in sheep numbers if there are die-offs inside the Park. These die-offs will probably extend through sheep ranges outside the Parks until reaching natural barriers. Hopefully, the response of the sheep that survive and their speed of recovery to high numbers, may be affected with management.
