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"The Parks are hereby dedicated to the people of Canada for their benefit, education and enjoyment, and such Parks shall be maintained and made use of so as to leave them unimpaired for the enjoyment of future generations." This statement from the National Park policy lays down two fundamental terms of reference:

1. Parks are set aside so the public may enjoy and learn from the natural features.
2. The natural features are to be preserved intact for all time. By these natural features are meant all the living things in the Parks, both plant and animal, and their non-living environment.

The concept of wildlife management in Parks is different from that on non-Park lands where management consists of the manipulation of animal numbers and habitat conditions to produce a maximum sustained crop of harvestable game. In Parks all wild animals, birds, reptiles and amphibians as well as plants are protected from destruction. Thus we do not categorize some species as pests (coyotes, skunks, etc.) that must be controlled. Nor do we rate others as more desirable (bighorn sheep, blue grouse, etc.) because they are important game species on provincial lands. In general, all wildlife species are to be given equal importance.

Changes in plant cover occur with plant succession, and there are corresponding changes in wildlife species. Thus the removal of spruce by fires may be followed by aspen poplar growth which favours an increase in moose, beaver and snowshoe hares. However, if no further disturbance occurs the tree cover will gradually revert back to a spruce forest with conditions slowly becoming more favourable for caribou, white-winged crossbills, spruce grouse, etc.

Some animals are capable of reducing their own food supply, thus contributing to population fluctuations. A population of hoofed mammals can increase until it damages the grass and browse forage and changes occur in plant community composition to the detriment of some animal species.

When ranges and forage preferences of animal species overlap (i.e. bighorn sheep and elk), competition for forage occurs and the species that suffers the most is the one with the more restrictive or selective diet (Cowan, 1950, Flook 1964, Stelfox & Taber 1969). For example, bighorn sheep are largely grazers whereas elk seem to have a broader adaptability to feeding and surviving on a wider variety of grass, shrub and tree species and coping with deeper snow conditions. In addition elk are at home on grassland, parkland or forest communities, whereas wild sheep prefer grassland communities in close proximity to rugged escarpment.

Diseases and parasites act as mortality agents especially in the bovids such as bighorn sheep but have less effect on cervids such as elk, thus favoring the survival of cervids. Conversely, predation by large carnivores such as wolves is heavier on elk than sheep thus favoring the latter (Cowan, 1947). However, it is difficult to maintain good wolf numbers in Parks because they also frequent adjacent non-Park lands and prey on livestock to the dissatisfaction of livestock owners.

In order to preserve soil, plant cover, and animal populations in a relatively harmonic but dynamic state within Parks it is sometimes necessary to control populations of hoofed mammals for the following reasons:

1. the wildlife management policy is designed to maintain natural and harmonious communities of plants and animals, with no animal species permitted to increase to a level where they cause:
 - a) serious depletion of native plant species.
 - b) serious depletion of other native animal species through elimination of their food or cover, or
 - c) its own disappearance through destruction of necessary habitat.
2. As most National Parks include, or are on the headwaters of, important watersheds, the maintenance of adequate plant cover, soil stability and water quality are of utmost importance. Uncontrolled populations of hoofed mammals can seriously damage watersheds, especially in the case of elk.
3. Some Parks border farm or ranch lands where an overflow of surplus elk or deer can cause economic losses to landowners which may cause a sufficient uproar in the voting public to force control measures within the Parks.

For the above reasons, management programs of hoofed mammals are implemented to keep populations within the carrying capacities of their ranges. These control measures are sanctioned in Section 7 of the National Park Regulations which states that the Director may authorize the Park Superintendent to take or destroy any game when such action is considered advisable for game management purposes. Elk, bison, moose and deer have been harvested in various Parks. Elk have required the most widespread control for reasons mentioned above.

Sport hunting is prohibited under the National Park Act and justifiably so for two main reasons:

1. it would set a precedent in National Parks exploitation.
2. the behaviour of the wildlife within the Parks is such that hunting or shooting them would not be much of a sport.

What is vitally needed in all Parks is:

1. A broad and effective public education program to inform the public on all natural park values and on the reasons for existing wildlife management or non-management programs.
2. the development of a sound wildlife management policy for each Park determined on the basis of the overall Park objectives and priorities of various wildlife species in relation to other natural features. This actually means placing priorities on each wildlife species as well as desired numbers of each species. For example, it is essential to determine the importance of bighorn sheep compared to elk, caribou, etc. as well as the impact that uncontrolled numbers will have on other important Park features. These priorities must also be determined in consideration of adjacent provincial plans and problems.

Finally, should bighorn sheep management within National Parks be designed to prevent population build-ups in excess of range carrying capacities and the consequent temporary die-off of roughly 75 per cent of the population. In considering the long-term welfare of the range, there is nothing to indicate that temporary range deterioration along the Athabasca Valley in Jasper National Park in the 1940's resulted in permanent range deterioration or reduction of forage production. Unless the contrary can be proven, there is little justification for bighorn sheep control within National Parks. It appears that at this northern latitude, the duration, severity and snowpack conditions of our winters are capable of inducing a reduction in ungulate populations when range carrying capacities are surpassed, before permanent range damage occurs.

Considering the problem of a pneumonia-lungworm disease in over-abundant sheep populations within Parks spreading to sheep herds on provincial ranges thus endangering their survival, this is a definite possibility and must be given serious consideration. However, a review of past die-offs in western Canada indicates that provincial herds suffered declines at the same time or at times even prior to die-offs in adjacent Parks. The heavy use of livestock, or land alienation, on important sheep winter ranges outside the Parks has often been responsible for triggering die-offs as fast if not sooner than has occurred in unhunted herds within the Parks. It is likely desirable to maintain optimum numbers of transient sheep herds by inducing surplus animals to migrate onto provincial lands where they can be cropped by hunters.

Within the Parks it is more important to consider habitat management (perpetuating sufficient grasslands), and to minimize interspecific competition, assuming of course that the Parks objective is to perpetuate large numbers of bighorn sheep.

According to a previous speaker, only about 5 per cent of the bighorn sheep are being harvested annually in Alberta. If the provincial objective is to maintain populations within the carrying capacity of winter ranges this would likely necessitate cropping at least 15 per cent of the presently high population. One of the most damaging programs we could implement either within or without the National Parks would be one designed to harvest less than the optimum number of sheep from a range management standpoint. Such a program would permit over-abundant populations to exist for longer durations before a die-off, thus causing more severe range damage than would occur if no population control existed and populations declined sooner after they exceeded range carrying capacities.

References

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Question Period

- Q. (to J. Stelfox) Does the Park really consider the population of sheep outside the Park to be an important factor in Park sheep management?
- A. I will turn that question over to Sandy because the management of all wildlife in natural surroundings in the Park is controlled by Park staff on the advice of the Canadian Wildlife Service. I would say that it definitely should be considered.
- S. Rolfson - I think I would start that off by saying that the Park requirements would come first. However, we are in the process of working very closely with the Alberta Fish and Wildlife Division and we are trying to establish joint management on both sides of the boundary.
- V. Geist - with regard to the lungworm - pneumonia complex, animals become so heavily infected that at this state of high infection, they will catch pneumonia and die off. I am wondering if we should not identify a virus sweeping through. I do not believe we have the answers.
- J. Stelfox - I would like to comment further that I would think that Dr. Holmes and other parasitologists would tend to agree that looking at past die-offs in bighorn sheep we do not want to look just at pneumonia or incidences from virulent strains involved. Looking at the habitat of the animals and the range quality and quantity is the important aspect and we should put less emphasis on pneumonia - lungworm.
- Q. I would like to ask Sandy what developments within the Parks he thinks are the key developments that should be considered with respect to wildlife?
- A. I do not know if we can answer this. We have studies to understand the **impact** on changes to animal populations. We have gone into a crash impact study on the Trans Canada highway. We are looking at it closely from an ecological standpoint. I do not know that we are establishing any priorities right now.
- Q. Do you have ecologists looking at this?
- A. Yes. We are going to the Canadian Wildlife Service, to University graduates, etc. Our priority for special studies are first to the government agency, such as C.W.S., or Forestry people; subsequently we go to Universities. Then we will look to outside consultants and there are a large number of those kind of organizations coming up all over the country.
- Q. I do not see very much difference in the concept between the proposal put forth by Mr. Wishart of "shoot them while **you** have them" and Stelfox's "let them all die".
- V. Geist - One of the major reasons why we must have information is indeed to know how and when die-offs occur and what the reason for them is. We are just getting into the age of knowing something about living things. We are at the very early stages. It is imperative that several areas should be that we let nature take its course.

- R. Demarchi - In addition to what Val said about establishing animals, one has to restore natural ecological systems in our National Parks as they now exist and if possible try to restore the natural balance. Removal of livestock would not solve the problem and die-offs are most severe when they start. Our goal in British Columbia is to remove all livestock from our bighorn sheep ranges. We are trying to find out what effect cattle have had on sheep as livestock are not part of the natural ecological system. They are not truly a competitor on the same scale. We should examine those ranges that are natural and also those that are mucked up by livestock.
- D. Neave - You said your Department's policy was removal of livestock. I think we can say that the Alberta Fish and Wildlife Division feels the same way. We are looking more at livestock on elk and wildlife ranges and I agree that the range would be in better shape if we removed livestock in many areas.
- J. Holmes - I would like to comment on some of the parasitological information that has been flying around. We have done some studies in the National Parks on animals that have been made available to us and looking at the species that have been found there. The sheep herds have not had contact with livestock. In the Sheep River herd we have information about parasites and if we look at the species of parasites that are present, we find that the greatest amount of overlap as we might expect is between domestic sheep and wild sheep. The only studies we made have come to the conclusion that there may be different strains involved between wildlife and domestic species. We made no studies in areas where there are overlapping distributions. So far on the bighorn sheep, it does not look as if there is a great deal of inter-action there. Lung worm burdens found at Sheep River had less lung worm in the herds than the lung worm loads in the herds in Jasper but not much difference than Waterton or Banff Parks.
- A. Schallenberger - I would like to say that the Alberta Fish and Wildlife Division should shoot more bighorns. Everybody so far has carefully avoided shooting more than 5 per cent of the bighorn herd. I think this is one of the alternatives that can be considered here, if you reduced herds and kept ranges in better condition. Possible reduction of the bighorn herd would not do much good if you have an over-population of elk.
- J. Stelfox - By controlling to prevent fluctuations, you do more harm in cropping 5 per cent and maintaining your range in poor condition. What you should take would be approximately 15-25 per cent harvest to get down to a point where you permit the range to recover to a healthy state and then continue cropping. If we look at Jasper's present population of 2,500 to 3,000, we know we have too many animals on the ranges at present. The 85 per cent die-off in the 1940's in Jasper permitted the range to come back. I am sure it would be essential for us to bring the population down to something in the neighborhood of 1,000-1,500 in order to induce winter range improvement. It would be far worse to pick away at this population. We are looking at other means of control. If it is hard to find a full sized ram outside the Park, then it might be desirable to maintain populations with a top-heavy balance toward rams. Before

we get into this control we really have to know what management is required if we are going to maintain good range conditions.

- D. Neave - We certainly would like to shoot more non-trophy sheep. We have only 400 permits issued, but do not receive more than 500 applications. The only thing we can do is saturate some areas with more non-trophy sheep hunters and eliminate a large number of sheep in a smaller area.