PRESCRIBED BURNING FOR WILDLIFE HABITAT MANAGEMENT IN BRITISH COLUMBIA

by

D. Eastman[1]

Ladies and gentlemen, in the next few minutes I would like to describe how prescribed fire is being used as a tool of habitat management in British Columbia. Since I am unable to come to the conference and also because I haven't written out my talk, I thought I would do the next best thing, and that is to send you this tape. This is the first time I have tried it so I am a little bit hesitant and hopefully the experiment will be a successful one.

The basic outline of my presentation will be first to describe the rationale, or in other words why are we using prescribed fire in British Columbia, discuss briefly the historical use of prescribed fire, outline some of the reasons why we are using prescribed fire, discuss the extent of its application in the province and some of the common features of our burning programs in B.C., and then finish with a brief statement of what I think are some of the future roles of fire, some of the needs and problems that we face in making prescribed fire an acceptable and respectable tool of wildlife management.

This province is fortunate in having a wide variety of wildlife species. This of course is a natural and inevitable consequence of the inherent ecological diversity found within the province. Although many people acknowledge the variety of wildlife species, the greatest public interest is in those that we typically call big game species, and in particular the large ungulates. Similar to most provinces and states, wildlife management in B.C. has concentrated upon these big game species. Also similar to most states and provinces, wildlife management is faced with a difficult challenge in the future. On the one hand we face

[1] Research Coordinator, Fish and Wildlife Branch, Ministry of Recreation and Conservation, Victoria, B.C., V8V 1X5

increasing demands for the wildlife resource. This demand traditionally has been by hunters, but more recently and just as importantly, is the demand by what we typically call nonconsumptive users. In other words, those people who want to see, photograph, and study wildlife species in natural surroundings. While the demand is increasing, the resource base that produces wildlife is decreasing. In British Columbia, we are losing very productive lands to such diverse and widespread activities as settlement, utility corridors, impoundments, coal exploration and development. Unfortunately, most of these types of activities occur on the critical winter ranges upon which the numbers of big game depend. Not only are we losing the land base from which to produce wildlife,but the vegetation on this land base is changing. Although it is too difficult to generalize throughout the province, I think it is safe to say that the change in vegetation has been to reduce the production of wildlife. Thus the wildlife manager is faced with increasing demand and at the same time a decreasing productive land base. In this situation, wildlife managers look to ways of increasing the production of wildlife on existing lands. This is what we could call wildlife enhancement.

Now there are many ways of producing or improving the production of wildlife on suitable lands, but of course faced with restrictive budgets we are looking at the most economical ways of enhancing habitat. Also, I think it is generally true that we are looking at ways that mimic the natural forces at work in these particular areas. For these reasons, prescribed fire holds great promise. We believe that prescribed fire, if properly used, has significant ecological, economic,and social benefits.

Before going any further, I think it is important to make several distinctions regarding the causes of fire. On one hand we have naturally caused fires and on the other we have man-caused fires. The category of man-caused fires can be subdivided into two subclasses. First, those that are accidentally set by man, and those that are delibertately set by man. I would consider that those that are deliberately set by man to be prescribed fires. In other words they are fires used for constructive purpose and according to a management plan. This last phrase is a definition of prescribed burning proposed by Biswell.

It is a well established fact that natural fire played a significant and integral part in the development of vegetation over much of North America. Although we have little evidence, I believe it is also true that prescribed fire was used to a significant extent by the native Indians before the arrival of white man. There are few data to relate the effects of wild fire and those fires caused by Indians to the abundance of big game. Most early travellers in British Columbia remark upon the apparent absence or at least scarcity of big game species in the province. Although this is very fragmentary evidence, it does suggest that wildlife, in particular big game species, was not very abundant under the regime of natural fire. With the arrival of white man and the development and settlement of many areas in the province, the incidence and extent of burning probably increased quite dramatically. In association with this increase in fire, there was an increase in the abundance of big game species. For example, we have the remarkable extension of moose from northeastern British Columbia through to the coast and into southern British Columbia over the period from about 1900 to 1945. Although it is circumstantial there seems to be good correlation between the southward spread of the species and the abundance and spread of fire.

In the east Kootenay region, there seems to be a good correlation between the widespread fires of the 1930's and the subsequent abundance of mule deer, white-tailed deer, elk and big horn sheep in the 1940's and early 1950's. Man-caused fires in the twentieth century have been both accidental and prescribed but perhaps the most ironic factor or feature of these fires from the point of view of a wildlife manager is that their effects on the wildlife were largely accidental. Thus for most of this century the large numbers of ungulates in this province have been fortunate although completely accidental spinoffs of fires set for other purposes.

With the increasing efficiency of fire detection and suppression the extent and role of fire in affecting wildlife populations has changed considerably in the last ten to thirty years. The productive seral winter ranges have been gradually filled in with coniferous regeneration. This change in the mosaic of vegetative cover has been relatively slow and for

the most part quite deceptive in the sense that many people do not appreciate that what is now a young stand of Douglas fir, lodgepole pine or yellow pine was once a seral shrub/grassland range. The effects of efficient fire suppression have been large with respect to ungulates.

But is is also true that complete suppression or exclusion of fire from forest systems in this province is having and will have tremendous impact upon the forest themselves. With the exclusion of fire in many parts of the province, the forests are accumulating litter and dead material that probably increases their flammability and predisposes them to some very large fires. I believe both from the point of view of forest management and wildlife management, we should be doing a lot more towards integrating fire or reintroducing fire as a natural factor in our forests. While most wildlife managers have accepted and recognized the importance of fire in the management of big game ranges, the prevailing government policy of complete fire suppression has prevented its application except in the past few years.

Now I would like to take a few minutes to describe where we are burning presently in British Columbia, what wildlife species we hope to benefit, and the results we have so far. To date we have done no prescribed burning either on Vancouver Island or the coastal mainland. All of the burning has been east of the coast range. Beginning in the southern interior we have been burning in the Okanagan region south of Keremeos. The target species is California big horn sheep and we are burning grassland areas that overlie chernozemic soils. The objective of this burning program is to improve the food supply on wintering areas by inducing early grazing on grasslands adjacent to their critical winter ranges. In other words we are trying to decoy the big horn sheep off these critical areas as soon as we can. To do this we are burning small patches in the spring. These patches are planned to create a mosaic effect on the grassland areas. This work has been underway since 1975 and is planned to continue for at least a couple of more years. The results to date indicate a successful program. The winter range vegetation is improving in condition and there is a remarkable shift of the big horn sheep off the winter ranges on to these burned-over areas in the early spring.

We are also beginning a small burning program in the Okanagan to benefit mule deer. This burning is occurring primarily in the Ponderosa pine/bunchgrass zone. The area is a critical mule deer winter range and the project objectives include a reduction in forest cover, an increase in forbs and shrubs, an increase in nutritive quality of preferred foods, and a reversal of the trend of pine to fir so that we can maintain a pine/bunchgrass type. Again for this area we are conducting rotational burning and we have planned assessments to monitor changes in the vegetation in its use by wildlife and also changes in the soils.

In the east Kootenay region of southeastern British Columbia we have an ambitious prescribed burning program. The burning program is coordinated and integrated with grazing systems associated with coordinated range use plans. This burning program began in 1975 with a 600 acre burn on one critical big game winter range. In 1976 two areas were burned. This year a total of about 6 acres was burned and we plant to burn many more areas in 1978. We hope that prescribed fire becomes a routine habitat management tool in these coordinated land use plan areas. The target species for these burns are primarily elk, secondarily mule deer and also big horn sheep and white-tailed deer. The areas being burned are mostly seral shrub/grasslands developed after the extensive fires of the late 1930's. The vegetation is quite variable,as is the parent material.

In general the management goal of the prescribed burning program is to enhance the wildlife resource, but in particular we want to recondition and rejuvenate the big game winter ranges. Important objectives for other users of these areas is to fire-proof and thin the regenerating forest and also to improve range for cattle. All burns are spring surface fires and are done in cooperation with the B.C. Forest Service and with local users. We have not conducted detailed monitoring of the effects of these fires but there was an obvious basal resprouting of willows, saskatoon, and even bitter brush. Grass species such as *Festuca idahoensis* and *Festuca scabrella* all show a remarkable response to fire. Our observations suggest that animal use is increased on these burned areas.

We have also conducted several small burns in the west Kootenay region,but in general the main thrust in southeastern British Columbia has been on the critical big game winter ranges lying in the Rocky Mountain trench.

It is in the southcentral part of British Columbia that prescribed fire for wildlife management had its origins. The first recorded use of fire in British Columbia for wildlife occurred in the mid-1950's in Wells Gray Park. These early attempts were generally unsuccessful because they were too cautious. But two things were evident. First, it was very difficult to burn mixed or deciduous stands on flat topography except in the most favourable conditions. Secondly, the regrowth of suckers from the roots of burned willows and aspens was immediate and vigorous after burning.

All remained quiet in the southcentral interior until 1966 when a six year burning program was undertaken, again in Wells Gray Park. This burning program was primarily to improve the habitat for moose. But a secondary objective was to maintain early seral stages of forests at low elevations to add to the diversity of the Park landscape.

During the period of 1966 to 1971 a total of 4200 acres was burned over ten locations. All these burned-over areas are producing more available forage than previous to the fire. All are used either moderately or heavily, primarily by moose and mule deer. These burns have been conducted either in May or June. While we were successful in burning 4200 acres of moose winter range,it appears at least tentatively that much of the area is unsuitable for economical burning and it has been suggested that mechanical treatment should be considered as an alternative method of habitat improvement in these areas that are unsuited to fire.

We are also conducting prescribed fires in southcentral B.C. on some Douglas-fir/pine grass and Ponderosa pine/bunch grass ranges. These are being conducted on low elevation mule deer winter ranges. The objectives of these other burns are to promote resprouting of browse species that have grown beyond the reach of ungulates and also to reduce Douglas-fir regeneration and remove the duff layer of yellow pine needles.

In central British Columbia we have a prescribed fire program for the Junction Wildlife Management Area, an area that is used by California big horn sheep. We are conducting burns on a shrub-grassland area where the major species are big sage brush and blue bunch wheat grass. The target species for this burning are California big horn sheep and mule deer. The objectives of this fire are:

1. to increase the quality of forage
2. to increase the production of forage
3. to retard or eliminate the growth of undesirable species
4. to alter the species composition of the plant community.

We are monitoring the effects of this fire in terms of the vegetation species' composition abundance, its productivity, and its nutritive value. We are also measuring the animal response through pellet group surveys and measuring the soil response through sampling of soil horizons. We had some preliminary results one year after the burn. First there was an increase in the forage quality primarily in group protein. This increase was large but short-lived. There also has been an increase in forage production that has been maintained over the two years since the burn. The big sage brush has been completely eliminated by the fire and this was the prime species that we wanted to get rid of. Primarily because of small sample sizes we have not been able to detect any significant change in the use of burn areas by mule deer or big horn sheep.

The last area where we have been conducting prescribed fire is in the northeastern part of the province. The target species are Rocky Mountain elk, stone sheep and moose. The areas being burned are the alpine spruce ecotone, aspen stands and seral shrub-grasslands. The management goal is similar to many of the other burns elsewhere in the province, that is,to increase the production of wildlife and so offset losses due to other factors. The main objective of the burning in the northeastern part of B.C. is to alter the successional stage of the vegetation to a form that is more usable by the target species. This program began in 1976 when about 25 000 acres were burned for elk. In 1977 about 75 000 acres were burned again primarily for elk. This burning occurred

in about four major river drainages. We have been successful in burning much larger acreages in this area than elsewhere in the province primarily through the coooperation of the B.C. Forest Service, the guides, and the fact that timber values in this area are generally quite low while the wildlife values are quite high.

From this brief perspective you can see that prescribed fire is a fairly recent phenomenon in B.C., that it is widely distributed geographically, and widely distributed ecologically in terms of the types of biogeoclimatic zones in which the burning is conducted. In almost all cases, we are conducting spring surface fires in nonforested or early forest successional stages. The burning is in almost all cases cooperative with the B.C. Forest Service. It is primarily oriented around benefiting big game. While most burning in southern British Columbia is in habitat types similar to those in the United States where we have a sufficient research background to allow prediction about the fire's effect, the burning in the northeast is in areas that have not been studied previously. For this reason we are particularly interested in the effects of fire in these areas.

Now I would just like to comment briefly on some of the future problems and needs I see facing prescribed fire in B.C. For sure we look to an expanding role of prescribed fire but we have two major obstacles to overcome. These obstacles relate to public attitudes and government policy. The Smoky the Bear campaign was effective but too simplistic and overemphasized all the bad aspects of fire at the expense of some of the very valuable benefits of fire. We now have a very important and difficult problem facing us and that is to educate the public into accepting fire as an integral and potentially useful tool in wildlife and forest management. This won't be an easy change to effect,I think,because people have some innate fear of fire and also because there will be some resistance in government to promoting a more tolerant attitude towards fire. The other major problem is in the area of policy. The fire protection divisions of our governments have to change to fire management divisions. This change has to be more than in name only and must reflect a genuine attempt to use fire sensibly in management. Without these two broad

areas of change, that is, changes in public opinion and changes in government policy, we face many difficulties in instituting prescribed fire in wildlife management programs.

On a more specific level, I think there is a need for us to improve the type and level of documentation of our fires. Ideally we need a practical and standard way of assessing the effects of fires, not only from the point of view of routine monitoring but also from the point of view of trying to understand the behaviour of fire more clearly and to predict the effects of fire more reliably. Thus our efforts in wildlife management in B.C. go along three major lines. First, we are attempting to modify policy and public attitudes in a variety of ways. Secondly, we are striving to incorporate prescribed fire more as a routine technique into habitat management. Thirdly, in the area of research we are trying to establish ways of monitoring the effects of fires so that we can understand them more clearly and are able to use fire more effectively.

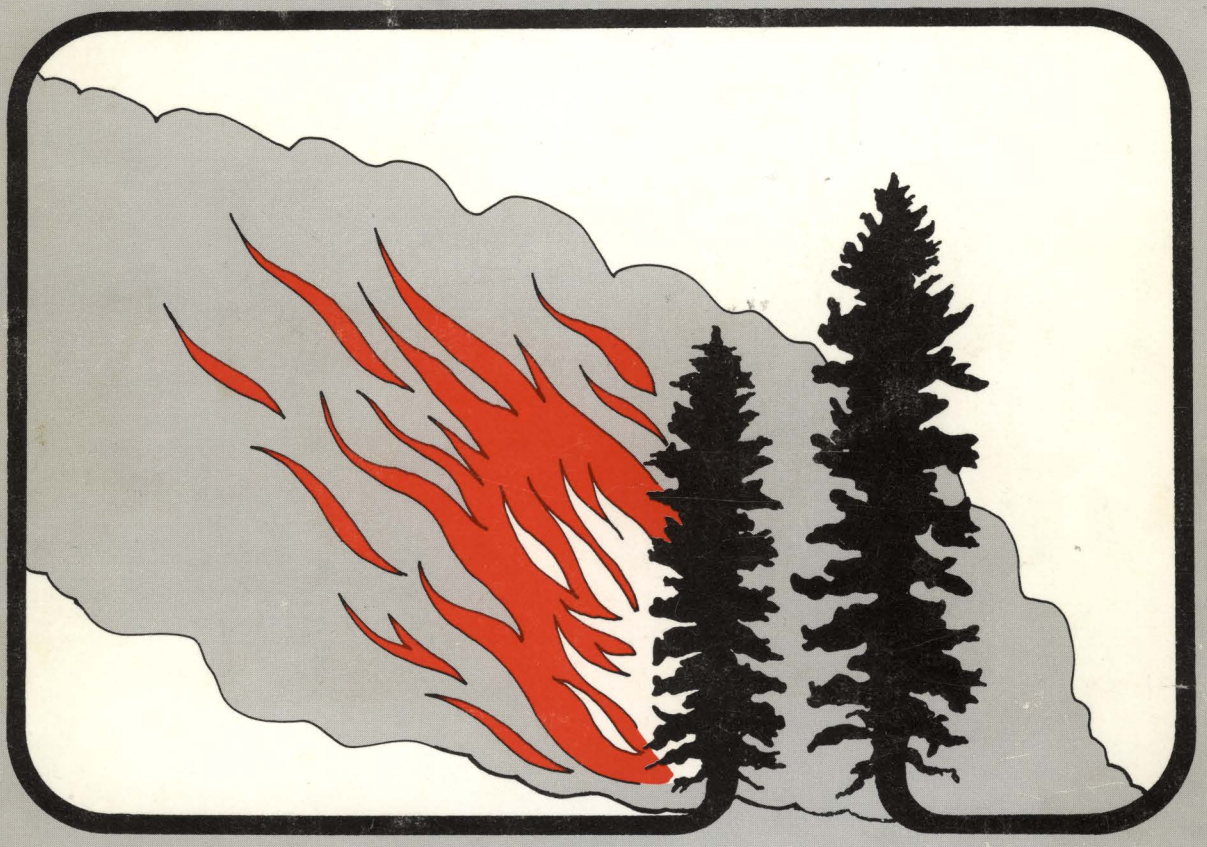
I will be writing up a paper on the use of prescribed fire in wildlife management in this province. It will cover much of the same ground that I have given to you already but will have some more specific details regarding the location, area and extent of fires.

Environment Canada
Forestry Service

Environnement Canada
Service des Forêts

Fire ecology in resource management

Workshop Proceedings



compiled by D.E. Dubé

Northern Forest Research Centre • Edmonton, Alberta • Information Report NOR-X-210

FIRE ECOLOGY IN RESOURCE MANAGEMENT

WORKSHOP PROCEEDINGS

DECEMBER 6-7, 1977.

COMPILED BY

D.E. DUBÉ

INFORMATION REPORT NOR-X-210
SEPTEMBER 1978

NORTHERN FOREST RESEARCH CENTRE
CANADIAN FORESTRY SERVICE
ENVIRONMENT CANADA
5320 - 122 STREET
EDMONTON, ALBERTA, CANADA
T6H 3S5