

REVEGETATION FOR WILDLIFE USE

Paper presented  
by:

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### INTRODUCTION

For this year's Symposium, I was requested to provide a short ten-minute instructional talk on how I, as an employee of the Wildlife Branch, would like to see an area revegetated for wildlife. The above title can be subtitled, "Once more with feeling", for reasons which will become apparent.

First, let me put revegetation into its proper perspective. Obviously, revegetation for wildlife use is only a small aspect of reclamation for wildlife. Before such revegetation is considered, one must consider whether reclamation for wildlife is necessary and, if so, what wildlife species are to be considered. Then, some large-scale habitat manipulation or landscaping is usually required, such as resloping, re-shaping for hydrological or cold-air drainage considerations in order to provide the necessary variability in microclimatic conditions.

Finally, after the previous processes have been completed it is time to revegetate your newly created habitat base to suit the desired wildlife species. Here then is where this talk really begins. Incidentally, for those of you who may be anticipating a series of "Wild Kingdom" photos, I should apologize for our Information Section who were unable to supply very many good photos.

In the next few minutes, I shall endeavour to serve up a "cook-book" prescription for the creation of habitat for six representative species, including Rocky Mountain Elk, Mule Deer, Bighorn Sheep, Mountain Goat, Moose, and Caribou. Unfortunately, it will be necessary to discuss these specie requirements in generalities, as my time at the podium is very short.

## ELK

We have two sub-species in B.C., each with very different habitat needs. One of these, the Roosevelt Elk, is however limited to Vancouver Island, so I will deal here with the more abundant Rocky Mountain Elk. This animal is much more adaptable and prefers habitat of mid-successional stages.

Habitat for Elk is relatively easy to define, because a great deal of investigation has been done in the United States. Clumps of coniferous cover are required to provide shelter, and these shelter stands should be interspersed among deciduous groves with an understory of shrubs, grasses, and forbes.

Revegetation for Elk should, therefore, involve the following:

- a) Where possible, plan "islands" of coniferous timber to be left intact, composed of Lodgepole Pine, Larch, White Spruce, and/or Douglas Fir, as site conditions dictate.
- b) Plant deciduous trees such as Black Cottonwood, Birch, Trembling Aspen, and especially Willow..
- c) Add a shrub layer of Red Osier Dogwood, Silverberry, Chokecherry, Wild Rose, and/or Thimbleberry, to provide browse foods.
- d) Plant forbes including Aster, Bead Lily, Columbine, Dandelion, Fireweed, Goldenrod, Fleabane, Marsh Marigold, Clover, and Vetches.
- e) In open areas and through the deciduous timber, plant grasses which are palatable and nutritious to Elk, including Bluegrass, Brome, Wheatgrass, June Grass and Sedge.

#### MULE DEER

Mule deer are primarily browsers (that is, shrub eaters) rather than grazers. Good mule deer range is similar to that for elk, but with greater emphasis on shrubs and trees and correspondingly less concern with the forb and grass layers. Provision of food and shelter are of primary concern.

Therefore, revegetation to favour Mule Deer should involve the following:

- a) Retention of islands of natural forest is a big asset. If shelter stands must be planted, Douglas Fir and/or Ponderosa Pine are preferred.
- b) As for Elk, the shelter stands should be scattered throughout a deciduous forest, but for Mule Deer, a heavy shrub layer is required. Therefore, revegetation should concentrate on Aspen, Birch, Willow and Douglas Maple, with an understory of Ceanothus, Salal, Red Osier Dogwood, Bitterbrush, Serviceberry, and Vaccinium.

#### BIGHORN SHEEP

The Bighorn Sheep is primarily a grazing animal found on climax grassland habitats on dry sidehills. Their grazing habits necessitate shallow snowdepths to permit access to grasses in winter.

Another habitat requirement for sheep is a proximity to steep, rugged escape terrain. Such a feature is, however, achieved during the "landscaping" phase of reclamation to which I referred earlier, and is beyond the terms of reference of this presentation which relates particularly to revegetation for wildlife.

Food species which sheep prefer include Wheatgrass, Bluegrass, and Junegrass, as well as some browse species such as Alpine Willows.

Scattered thickets of coniferous cover of a type to be determined by local site conditions should fringe the grass ranges.

Because Bighorn sheep occupy very small, discrete winter ranges, the creation of such ranges should be considered a very feasible and desirable outcome of mining reclamation work.

#### MOUNTAIN GOATS

Mountain goats differ from Bighorn sheep as they demand proximity to very steep, rough rock bluffs or crags which constitute escape terrain, rather than selecting a habitat by the more typical variables of food and cover. If such mountainous terrain is present, Mountain goats will derive nourishment from almost any grasses, herbs, shrubs, or trees which are available, however they prefer grasses and sedges.

Based on these considerations, the topic of revegetation for goats becomes inconsequential during reclamation, as the creation of habitat for goats would depend almost entirely upon the "landscaping" phase.

#### MOOSE

I regret that I was unable to get a satisfactory photo of this common species, but I think we are all familiar with its appearance. Moose are less dependent upon shelter than most other native ungulates, and can withstand snowdepths of up to one metre. Revegetation for moose should, therefore, concentrate upon the provision of food.

During the critical winter season, Moose feed almost exclusively on twigs and small branches of trees and shrubs, consequently, vegetation species for Moose should include Willow, Serviceberry, Maple, Birch, Red Osier Dogwood, False Box, Aspen, and Poplar.

Although the animal's diet changes rather drastically in other seasons, vegetation for non-winter ranges is available naturally, therefore, it is

unlikely that revegetation for such non-winter ranges will be requested by the Wildlife Branch.

#### CARIBOU

The caribou is a very nomadic and wild-ranging species with a highly specialized food source of Lichens and Forbes. These two factors make it virtually impossible to artificially create habitat for the species. It is in cases where areas are heavily utilized by such "unmitigable" species that the Wildlife Branch will be seen to strongly resist any efforts to explore for, develop, or produce minerals. When revegetation and reclamation will not serve to mitigate a disturbance, the only way to ensure the maintenance of a viable wildlife population is simply to stay out of the area.

#### SELECTION OF VEGETATION SPECIES

During the preparation of this presentation, I re-read my previous statements concerning the types of vegetation preferred by the B.C. wildlife and tried to assess its usefulness to the mining industry. And it is here that the subtitle of my talk, "Once more with feeling" becomes appropriate.

The preceding discussion of the habitat requirements of the wildlife utilizing native species, and not the commonly used agronomics, leads to an important question: Can anyone here specify the precise horticultural requirements for native species such as Red Osier Dogwood, Gooseberry, Paper Birch, Vetches, or even the native grasses?

While recognizing that some good pioneer work has been done by companies such as Cominco and Kaiser Resources, it is evident that the mining companies; The Ministry of Energy, Mines and Petroleum Resources, and the Ministry of Environment have generally ignored a significant presentation made at the 1977 Symposium by Mark Bell and Del Meidinger of the University of Victoria. Their talk dealt with the use of native species in the reclamation of disturbed lands, and several vital points were made.

Here then, once more and with feeling, is a reiteration:

1. Although agronomic species are suitable for use if the reclamation objective is agricultural production, or perhaps soil stabilization, these plants have been developed for a specific purpose. They are genetically uniform (and hence not readily adaptable to diverse conditions), and require intensive management.
2. Native species, on the other hand, are genetically diverse and have adapted to various climates and habitats.
3. There is a shortage of readily available seed or nursery stock, which has resulted in major limitations in research on the use of native species.
4. Research must be stepped up, and an annotated catalogue of native species used in reclamation should be produced.

Now the above may sound like a major undertaking, however, the appendices to the 1977 talk indicated that over 50% of the species which I have mentioned today had already been used in reclamation test plots and trials. Where then is the sorely needed embryonic catalogue of native species? No doubt some of you here today still subscribe to the theory of natural invasion of native species. That is, if one stabilizes the disturbed areas with agronomic species, native species will soon colonize the site. If this were so, there would be no pressing need for work on native species.

Evidence to-date suggests that this theory is not realistic. In the 1978 Symposium, John Errington presented an evaluation of current revegetation techniques throughout the province. In his final statement which summarized species performance on waste materials, he stated, "Invasion of native species was relatively non-significant." Again in 1978, the Fish and Wildlife Branch produced a report detailing ungulate use of some reclaimed mines in southeastern B.C. The report noted that plant species

diversity on seeded areas over a three-year period showed few changes, and that, "Only a few native plant species successfully invaded the seeded areas.

Based on these and other sources, I can only conclude that the invasion of natural species must usually be a very slow process indeed. Apparently, research into use of native species is much needed. Accepting the premise that such research is needed, and that the need was highlighted two years ago, I can only conclude that the mining association, the companies, and the provincial government collectively have been dilatory in collating existing information and producing new results.

It is not the purpose of this Symposium to promote communication in order to develop effective guidelines and technologies for reclamation? One may question why this hasn't been done for native species.

I think I can answer my own question. The government agencies will respond in financial and manpower terms, only to strong pressure from the public and industry. Until we are forced by you into making work on native species a priority, little research can be expected. And until some research is done, there is little sense in my coming before you to list plants which no one knows how to use.

I leave you with two recommendations. First, I ask that we in the mining sector get out of the "blind alley" of agronomic species. They are inexpensive and tempting but often not self-perpetuating, and, from a wildlife standpoint at least, not particularly useful. Secondly, use your company resources to conduct your own investigations of native species and to persuade those of us in the government to do our part. During one of yesterday's presented papers the orders of magnitude of increases expected in mining activity in the next 20 years were expressed. For once, let's try to avoid a crisis by having our information together before we reach a conflict.



DISCUSSION RELATED TO BEN VAN DRIMMELEN'S PAPER

Jake McDonald, Ministry of Energy, Mines and Petroleum Resources, Having just come back from Fiji, I want to ask you how the wildlife was in Fiji?

ANS. No comment.

Doug Christie, Reid Collins & Associates. I think one problem that we have had is simply this: we grow new plants but when the mining company comes to us and says we would like to order a thousand Red Osier Dogwood and two thousand Paper Birch, then we cannot supply them. The simple reason is that there isn't much sense in growing a certain plant if you are hoping that that plant will maintain itself in that area. Therefore, the demand has to be a planned operation where there is lead time allowed for the commercial person to get out and collect proper material and grow it for that particular area. It just isn't practical for a commercial supplier to keep stock of all the different provenances of these plants available. But the capability to grow these plants does exist.

ANS. Okay, I'm not talking here of reclamation of exploration roads or drill sites. If reclamation were to be done for wildlife, and I don't think that it would be in that many cases, it would be done over fairly large areas after a mine has ceased production. I think that along with the planning that goes into the mining, there should be proper planning for reclamation. If this planning is done, then you should have all the lead time you need.