Conclusions

It is anticipated that prescribed burning in Canada will be confined primarily to clear-cuts, although limited use for manipulation of vegetation is likely. Prescribed burning to reduce probability of wildfires and to create satisfactory conditions for reforestation can be made complementary; differences relate mainly to burning objectives and conditions. Research is required to determine short- and long-term fire effects on forest ecosystems to facilitate prediction of burning results and to determine benefit-cost ratios of burning for fire protection, reforestation, and related land-use objectives.

The elimination of fire from the unmanaged forest is unnatural and will result in climax forest conditions which may not be desirable for recreation, the amenities, wildlife, or forest management.

There is an urgent need to inform the general public, resource managers, and conservationists about the historical role of fire in the forest and its proper place in wildland management. These objectives can best be achieved through non-scientific publications, movies, television, and well-publicized demonstrations. Properly co-ordinated with fire prevention objectives, such a program should go a long way towards clarifying to the resource manager and the public the beneficial use of fire in the forest and its place in integrated land-use planning.

At northern fringes of the boreal forest, fire has played a prominent part in regulating the level of permafrost. Research should be initiated to clarify the effects of wildfires on the ecology of the tundra, particularly as they relate to site condition and productivity, plant succession, and wildlife populations.

Methods and Treatments Used To Secure Natural Regeneration in British Columbia

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Abstract

Natural regeneration will continue to play an important role in forest management practices in British Columbia despite the recent increase in artificial regeneration. It is anticipated that by the time the artificial regeneration programme has been fully developed, up to fifty per cent of the areas logged will be restocked artificially, leaving the other fifty per cent to restock naturally.

Méthodes et traitements en usage pour assurer la régénération en naturelle en Colombie-Britannique

Résumé

La régénération naturelle continuera à jouer un rôle important dans l'aménagement des forêts de la Colombie-Britannique, malgré l'essor récent de la régénération artificielle. On prévoit que lorsque le programme de régénération artificielle sera complètement développé, il répondra à 50% des besoins de régénération des superficies exploitées, laissant l'autre 50% à la régénération naturelle.

During the past decade, the scale of cut timber on the coast has increased 73 per cent while in the interior the scale has increased 90 per cent over the same period. The total volume removed in the peak year was 1,890,000,000 cubic feet⁽¹⁾. During the same period production of planting stock rose 180 per cent on the coast and 700 per cent in the interior. In the peak year, 35,700,000 trees were produced. By 1975 production is expected to increase

to 75,000,000 trees annually. It is anticipated that the 75,000,000 trees will restock approximately 200,000 acres.

By 1975, if production trends continue, the annual cut will be in excess of 2,000,000,000 cubic feet. Under present standards of utilization, approximately 400,000 acres will be cut-over annually. This acreage could increase as poorer sites are harvested. It is, therefore, likely that at least 50 per cent of the acreage to be logged will be regenerated naturally.

In British Columbia, one tends to divide the Province into two major divisions, the coast and the interior, and to prescribe treatments on the basis of the forest types and their physical properties within these regions. Rowe's classification⁽²⁾ also segregates coastal and interior regions and provides a further means of relating silvicultural treatment to less-broad geographic areas.

Coast Region

Traditionally, clear cutting has been and will continue to be the preferred harvesting system on the coast. Many foresters in the southern Pacific coast section C.2 and minor parts of the Strait of Georgia, section C.1⁽²⁾, prescribe planting as the total regeneration method, even though coniferous stocking could be expected on many sites. The measure is taken, however, to influence stand composition, stocking density, regeneration period, individual tree growth and ultimately length of rotation. Some foresters, particularly in the western hemlock associations of the northern C.2 zone rely on natural re-

generation as a satisfactory method to obtain adequate and almost immediate stocking. They, therefore, plan a patch logging or dispersed logging system which have openings within natural seeding limits and which usually do not exceed 150-200 acres in size. The reserve timber blocks under the patch system have a dual function. In the Douglas fir types, where natural regeneration poses more complex problems than hemlock types, the blocks may serve primarily as a means of breaking slash continuity, rather than as a seed source. Douglas fir is not likely to be naturally regenerated but in some instances the reserve block is relied upon to "fill-in" a widely-spaced Douglas fir plantation. The forester will, however, supplement a plan for natural regeneration by planting bottomland, potential brush areas and areas where existing ground cover prohibits natural stocking.

Clear-cuts of 200 acres or less within the hemlock association of Rowe's⁽²⁾ northern Pacific Coast section C.3 and the Queen Charlotte Islands, section C.4 appear to naturally restock without difficulty. A trend toward extensive north coast plantations is not generally evident. Planting still finds its highest potential further south. Except for brush lands and other areas where natural seeding is not likely to restock, plantations are of minor importance from an acreage standpoint.

Northern Interior Region

Nearly 30 per cent of British Columbia's total land surface lies within the Boreal forest⁽²⁾ and northern portions of the interior sub-alpine section. Here forest exploitation is not too evident except for the logging of higher-site pockets in the south-eastern part of the Boreal forest region. The region, with its extremes of climate and productivity, will be difficult and costly to regenerate. Economics and the preponderance of low-site will be responsible largely for the use of natural silvicultural methods in the area.

One can consider the interior sub-alpine section SA.2 and the M.3 and M.4 sections of the Montane forest region⁽²⁾ to constitute the major harvesting area of the northern interior, the focus of which is the City of Prince George.

Generally, forest policy⁽³⁾ in the northern interior requires clear-cutting and the use of staggered settings. The settings are somewhat smaller in size than coastal clear-cuts and are employed in stands not susceptible to wind, insects, or disease.

Although the benefits of hazard and watershed protection apply, reserves provide mainly an assistance to restocking on high-sites as such areas are usually planted. The reserve, as a seed source, is commonly used on the medium and low-sites where seedbed preparation is accomplished by the following:

- tree shear, full tree or other conventional logging operations during snow-free periods,
- winter logging operations subject to summer chain-drag scarification or post logging scarification using tractor and blade,
- pre-logging scarification of reserve blocks of timber of setting size or better.

Such treatments are effective in natural stocking and are generally reliable if timed closely to seed-mast years. Scarification on both a pre- and post-logging basis is employed in the spruce and wet belt Douglas fir types and considerable success has been obtained with this treatment. To date over 105,000 acres have been scarified using conventional tractors. As better utilization has moved into the lodgepole pine types, there is an increasing trend to follow logging by drag scarification.

Southern Interior Region

The region occupies the interior plateau and interior uplands, approximately south of the City of Quesnel. The cutting trends and methods in most wet and semi-wet belt forest types are similar to the northern section.

In the Douglas fir-yellow pine-western larch complex (dry belt), natural regeneration is preferable. These stands are generally characterized by an understory which, with careful planning and logging techniques, can form the basis of the next crop. The areas are partially cut, usually by the application of larger diameter limits. Artificial regeneration in these types has not shown the degree of success associated with its use in other forest types. Similarly, some spruce-balsam stands often have adequate and acceptable understoreys of advance regeneration.

Better utilization, full tree skidding, mechanical disturbance of the seedbed, the use of drag scarifiers where necessary and the burning of slash at the landing has done much to promote natural regeneration of lodgepole pine.

In the decadent wet-belt types, especially cedar-hemlock associations, the incidence of decay has, over the years, caused a problem. Improved utilization is now removing much of the crop which was formerly left behind following logging. Studies have been carried out in the Blaeberry River and Noisy-Mabel Creeks to determine the techniques best suited to rehabilitating these stands. To date over 500 acres in the Noisy-Mabel drainage and some 1,200 acres have been treated in the Blaeberry River, using a variety of techniques. Indications are that clear cutting will be followed by a combination of natural and artificial regeneration with the latter system likely to be preferred.

Economics, integrated use and the increasing demand for environmental quality will influence silvicultural and natural regeneration decisions. Because of the individual response of forest sites to denudation, it is reasonable to assume that natural regeneration methods will continue as a means of forest replacement, regardless of the demand for forest products.

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