CANADA

Timber Talks

Department of Fisheries and Forestry

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PROTECT BY BURNING No. 50

Prescribed burning is the application of fire to accomplish satisfactorily and safely one or more objectives of forest management. In British Columbia, primary objectives are the reduction of hazard from fire and the improvement of sites to facilitate re-stocking with desirable tree species. Such treatments must be economically sound and the benefit cost ratios equal or better than other management practices that achieve the same objectives. Minimization of burning costs requires capability to predict the behavior and impact of prescribed fires under different conditions of weather and fuels.

Four cut-over areas near Enderby, B. C., were burned on slopes varying from 14 to 34 per cent, where gross volume ranged from 68 to 104 C cf/acre. The age of slash on three sites was 10 months and on one 24 months. Continuous weather and fuel moisture records were maintained throughout the summer. Fuel complexes were measured by line transects and from the measurements the characteristics of loading, fineness, porosity and compactness were determined. Organic layer was measured with wire reference pins and fire impact evaluated by water calorimeters.

Fuel loadings ranged from 222 to 235 tons/acre, approximately 40 per cent being larger than 11-inch diameter and 40 per cent in the organic layer. Fuel depletion, particularly larger material, was greater for cedar than for hemlock, Water loss from calorimeters was directly related to depletion of the finer fuels and the organic layer, providing some basis for a gross assessment of fire impact.

Characteristics of the fuel complex influence fire behaviour, but those of fineness, porosity and compactness of the pre-burn and post-burn complex are not reliable for prediction of rate of spread. The rate varies with age of slash, fuel loading and size of fuel components. Fire spreads most rapidly in fresh slash and when the fuel loading is heavy, and for similar complexes this can be used for prediction. Fuel loading was the most acceptable measured fuel parameter for assessing hazard abatement but when used for this purpose, the upper diameter limit of the fuel components must be defined and related to the desired level of hazard reduction.

Acceptance of any management practice requires achievement of the objective and sound economic feasibility. If the purpose of prescribed burning is hazard reduction, the treatment should be evaluated on success in reducing the inflammable fuels to a defined acceptable level, and other benefits considered of lesser importance and of value only if they are utilized. Benefit/cost ratios are dependent on potential fire size in initial and residual fuel complexes, difficulty of treatment, expectancy of wildfire initiation and expenditures and capability of control agencies for suppressing wildfires. Formulae using assumed values are suggested for computation of benefit/cost ratios to evaluate hazard abatement treatments implemented under different degrees of hazard. Assumptions are made for fire rate of spread, costs of wildfire suppression in treated and untreated fuels, cost of treatment, effective attack time and acreage of treated areas.

REPORT: Prescribed fire - Evaluation of Hazard Abatement. S. J. Muraro, Forest Research Laboratory, Victoria, B. C.