CANADA

Timber Talks

Department of Fisheries and Forestry

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CLASSIFYING MOUNTAINOUS FOREST SOILS No. 53

Increasing interest in intensive forest management emphasizes the need for more knowledge of soil-plant relationships. Meaningful descriptions are required to differentiate gross differences in soil for programs of planting, brush disposal and slash burning, and for the evaluation of smaller differences that are pertinent to tree nutrition, productivity, fertilization, physiological diseases and other related problems.

Soils of the Dry Subzone of the Interior Western Hemlock Zone of British Columbia in the southern half of the Monashee and Selkirk Mountain Ranges were classified in accordance with nomenclature of the National Soil Science Committee of Canada. Aggregations and concretions within the soil were described and pH, color and texture determined for all layers of 168 profiles. Further chemical analysis was carried out on 70 profiles, including tests for exchangeable Ca, Mg and K, adsorbed phosphate, N and organic matter. Physiography, erosion and depth to ground water was described and soil profiles designated as dry, moist, gleyed or wet. Soil moisture measurements were made on a range of sites.

Profiles representative of 5 soil orders, including 9 great groups and 23 sub-groups, were encountered. Sub-groups were subdivided by moisture conditions and those of similar nutrient and moisture status grouped together for uniformity of productivity. Soil formation is influenced by relief, degree of slope, exposure, parent material, ground water, soil moisture and temperature. Convex relief and warm steep slopes are conducive to the development of dry soils; moisture deficiences are common on convex slopes, in normal soils on steep, warm slopes and on most shallow soils. Podzolization, the transference of materials (iron, aluminum, clay, etc.) from upper to lower levels in the profile, is usually associated with cold gentle slopes or flat areas and on coarse textured parent material. Strongly podzolized soils seldom occur on steep (over 20°) slopes and never on steep slopes with warm exposures. Soils from fine textured parent material generally have a good nutrient and moisture supply.

Because of the mountainous nature of the area, non-zonal soils were common. Retardation of zonal characteristics was attributed to edaphically wet conditions, especially those with excess calcium, edaphically and climatically dry conditions, immature parent material and differences in physical and chemical soil properties. Specific vegetation types were found on several kinds of soil, although one or two generally characterized each type. Major ecosystem types and associated major soils are different at various locations on slopes being a response particularly to relief which is related to nutrient and moisture status of the soil.

Soil and floristic descriptions of forest sites provide a sound basis for management practices. Meaningful and usable soil relationships can be obtained when the number of soil categories are reduced by grouping them on the basis of their nutrient and moisture status.

REPORT: Soils and Soil-Vegetation Relationships of the Interior Western Hemlock Dry Subzone of British Columbia. R. B. Smith, Forest Research Laboratory, Victoria, B.C.