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- Establishment and Progress Report, 1962 -

A WEIGHTED EFFECTIVE SOIL DEPTH CONCEPT
OF THE EVALUATION OF LODGEPOLE PINE SITES.

(Project A-70)

by

J.R.B. HOLMES

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Introduction

The purpose of this study is two-fold, first, to test the hypothesis that lodgepole pine sites can be classified from aerial photographs with a minimum of ground work using readily recognized physiographic features. The success of the approach is based on the validity of four hypotheses which were tentatively validated at Kananaskis, Alberta in 1960, (Holmes, 1961). Secondly, the classification and map of the sites in the 14.5 square-mile study area near Whitecourt, Alberta is to serve as the framework within which a program of applied silviculture research will be planned.

The Study Area

This study is being conducted on a 14.5 square mile tract of forest in Township 60, Ranges 19 and 20, W5 Meridian, in the B-19a Section of the Boreal Forest Region of Alberta, (Rowe 1959). This tract was set aside by the Alberta Department of Lands and Forests in 1958 as an area in which applied regeneration silviculture trials could be conducted for the purpose of developing standard harvesting techniques for the stands and sites common to the region.

Field Work 1961

During the summer of 1961 approximately nine weeks were spent locating and identifying landforms, examining and describing the soils of each landform, and in measuring the stands growing on them. Field work was conducted as follows:

1. Landform identification -

- (a) All outstanding topographic features were marked and tentatively identified on aerial photographs.
- (b) Features marked on aerial photographs were located on the ground and were identified. Soil pits were excavated on several situations on each landform, and a detailed description was made of the soil profile. All pits were excavated several feet below maximum rooting depth to detect any features of the substratum which might influence tree growth (e.g. bedrock, impermeable pans, buried sand or clay layers, etc.).

Soil samples were collected from each horizon of the profile as well as from the underlying parent material; textural analyses have been performed on them.

2. Stand measurements -

In order to minimize ground work and assure accurate placement of sample plots the following procedure was adopted:

1. A line of tentative plots was chosen from aerial photographs and a reconnaissance of the line was made using hand compass, chain, and photo location. Each plot location chosen on the photographs was examined on the ground for stand condition; (i.e. disturbance from fire or insects, etc.), and to make certain it was located on

the desired landform situation as interpreted on the photographs. When the final plot location was decided upon it was pin-pricked on the photograph and referenced by bearing and distance to another plot on the same line, and, wherever possible, to a well defined tie point. In this manner it was possible to accurately scale the plots off the photographs onto the 4 in. to 1 mile work maps. Each day's plot work was laid out as a continuous traverse with definite tie-points at either end, and as many as possible at intermediate points along the line. By plotting traverse lines, plot locations, and tie points to scale on a 1/15840 base map the plots become semi-permanent in that they can be relocated within a few feet of the original station. A total of 280 - 1/10 acre plots were established in this manner, the following data were collected from each:

- (a) Tally of all trees 0.5 inch d.b.h. and larger by 1 inch diameter classes.
- (b) Total height to the nearest foot, and d.b.h. to the nearest 1/10 inch of one tree of each species in each diameter class represented on the plot. Each of these trees was drilled for age at stump, and for diameter growth in the last 10 years.
- (c) On each plot regeneration was tallied in four milacre quadrats, one in each corner of the plot.
- (d) Subordinate vegetation was listed in order of abundance.
- (e) Soil type was checked with the soil auger.

- (f) A sketch, showing direction and slope percentage, was made of the drainage pattern of each plot.
- (g) Notes were made on aspect, exposure, adjacent topography, litter and humus depth, and any other notable plot characteristics.

Compilation of stand data is currently underway, and should be completed shortly. A preliminary site map has been prepared showing sufficient detail for management purposes.

Field Work 1962

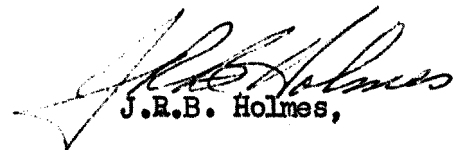
In compiling the data collected last summer it has become evident that more information is required to substantiate some of the findings, and to permit greater accuracy in placing site boundaries on the map. In several instances apparent growth differences have shown up between sites which appear similar on the photographs. In other instances sites which appear different on the photographs show similar growth potential when stand data are compiled. Still other areas have shown up as transitional between two rather distinctly different sites.

This summer it is planned to spend about 4 weeks collecting additional data from specific stands to fill in existing gaps, and to check for errors in last year's work. Some additional soils and rooting data will also be taken. Additional increment borings will be made in problem areas to try and explain some of the unexpected and currently inexplicable results obtained from last year's work.

Compilation of data and preparation of a report for publication will be completed by the fall of 1962.

Calgary, Alberta.

April 30, 1962.


J.R.B. Holmes,

Research Officer.

References

- HOLMES, J.R.B. 1961 - A preliminary examination of soil depth and topography in relation to basal area in lodgepole pine. Canada, Dept. of Forestry, Forest Res. Br. Mimeo 61-17.
- ROWE, J.S. 1959 - Forest Regions of Canada. Canada Dept. of Northern Affairs and National Resources, Forestry Branch, Bull. 123.