FOREST RESEARCH IN CANADA DURING 1928.

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NOVA SCOTIA

The Dominion Forest Service report as new work undertaken in 1928 in this province the establishment of 10 one-acre permanent sample plots in co-operation with the Provincial Forest Service and private owners. These plots are in 20 to 40-year-old stands in white pine, red pine, poplar, and balsam-spruce types. They will form the basis for a study of methods of managing farmers' woodlots.

NEW BRUNSWICK

The Provincial Forest Service report the following for 1928:—

1. Study of diameter cutting limits for black spruce areas from the standpoints of scaling, operating, and utilization.
2. Study of scaling relation between cubic and board foot contents of pulpwood in long lengths; and of the relation between board feet and cords. As a result, pulpwood since August has been returned as cords instead of board feet, and a figure of 500 feet per cord used as a converting factor for stumpage dues assessment.

The Dominion Forest Service carried out the following research in co-operation with the Provincial Service:

3. The establishment of a number of plots in connection with experimental cutting areas handled by clear cut strips, selection, and shelterwood methods.
4. The establishment of plots on areas girdled to release conifers from over-mature and defective hardwoods.
5. The thinning of two plots of dense spruce and balsam.

QUEBEC

1. The Quebec Forestry Service report a continuation during the year of its investigations of tree-seed germination, nursery practice, scaling, tree growth, reforestation, etc., some of which will be ready for publication shortly.

2. The Dominion Forest Service continued their work based on the Lake Edward Forest Experiment Station by (a) the establishment of a series of permanent sample plots for study of rate of growth and reproduction; and (b) remeasurements of 15 plots.

3. Price Brothers & Co., Ltd., report the current year's work as follows:

- (a) Sinkage studies on spruce, balsam and birch in co-operation with the Woodlands Section of the Canadian Pulp and Paper Association.
- (b) Continuation of increment studies.
- (c) Continuation of regeneration studies, involving this year experimental cuttings in black spruce and seed spotting.

- (d) Continuation of various studies of mensuration problems.
- (e) Investigation of newsprint yield from different species and different qualities of wood.
- 4. The Technical Committee of The Association of Forest Engineers for the Province of Quebec reported two lines of study for the season:
  - (a) Examination of the feasibility of adopting for working plan surveys, a standard of accuracy in the results (as applied in Finland, Sweden and other countries), in place of a standard series of methods, or a standard schedule of cruising.
  - (b) Collection and examination of available silvicultural data with a view to a final analysis at a future date when sufficient information, bearing on silvicultural problems under various conditions met with in Quebec, justifies a conclusion as to the best general methods.

ONTARIO

The Ontario Forestry Branch report the following program carried out in 1928:—

1. Nursery investigation. (a) Study of 130 experimental beds of red pine seedlings from the standpoints of their development and causes of mortality. The factors involved were date of sowing, amount of seed sown, and soil treatment.

(b) Experiments in nursery practice with white and norway spruce with particular reference to production of uniform transplant stock.

2. Seeding and planting experiments. (a) Setting out of experimental plantations involving 4 British Columbia and 14 Japanese species from seed of known origin.

(b) A combined seeding and planting experiment covering 143 acres of logged-over, repeatedly burned land, in Parry Sound. Red pine transplants were planted at 25-foot spacing; then jack pine seed was broadcasted at the rate of 1.7 pounds per acre.

(c) The annual mortality counts in connection with direct seeding experiments (both seed spotting and broadcasting) begun in 1926 in barren areas in the north, involving white, red, jack and scotch pine. Results are promising only in the case of the two latter.

3. A continuation for the second season of an investigation on the indicator significance of ground vegetation in classifying forest types. Sample plots of one quarter acre size were laid out in various forest formations in the Mississagi Forest Reserve. Of these, ten were in white pine, eight in jack pine, seven in white spruce and four in sugar maple. On each plot the vegetation was listed in quadrats on one-half square yard, approximately thirty-three of these to a plot.

4. The growth and yield studies of spruce and jack pine in the Onaping lake district were continued for the second season. In all, 607 sample trees distributed over 23 plots were analyzed. The object of this investigation is to arrive at a basis for estimating the yield at maturity of immature stands of fire origin, which to-day comprise over one-third of that portion of the pulpwood region of the province so far inventoried. In particular, the investigation is to cover (a) the rate of increase in volume of the trees that form the final crop; (b) the rates of diameter and height growth of the trees of different sizes; (c) changes of diameter-height and diameter-form-class relationships, which are of importance in ordinary cruising as well as in estimating yields; (d) the influence of differences in site and composition on each of the above.

The Dominion Forest Service report the following:

1. Continuation of research at Petawawa Forest Experiment Station. This season particular attention was paid to the establishment of permanent sample plots on areas that had been recently cut over. In addition a section of pure hardwood was segregated for management as a woodlot.

2. Completion of line plot survey for study of rate of growth in Goulais river watershed north of Saulte Ste. Marie, as a continuation of previous work there. In addition to remeasurements 5 one-acre permanent sample plots were laid out.

The Iroquois Division of the Abitibi Power and Paper Co. reports the following:

1. A study of brush disposal. Twenty-five acres of black spruce swamp have been divided into five permanent plots for periodic examination to determine effects of logging methods on reproduction, on growth of remaining stand, etc., with the brush handled in different ways. A preliminary report will be made in the fall of 1929.

2. A study of the effect of drainage on growth of swamp forests. Examination of areas drained in 1922 revealed great increase of growth rate. Areas were selected and a working plan drawn up for a complete and intensive study in swamp drainage. A preliminary report will be made in the fall of 1929.

3. Various operational investigations, viz.:—

(a) Effect of various bottoms (timber types) on cost of spur construction, maintenance and locomotive operation.

(b) Effect of curves, grades, rail, temperature and weather, on railroad operating efficiency.

(c) Types of substructure to secure greatest economy in spur construction.

(d) Effect of operating factors (haul distance, percent balsam, underbrush, size of timber, cords per acre, consolidation of logging chance, and personal efficiency) on cost of logging.

- (e) Study of relative efficiencies of oil diesel alligators as compared to steam powered units.
- (f) Measurement of wood in water transit (in drives, reserves, tows, sluiced, in mill pond).
- (g) Annual sinkage of Douglas fir boom timber.
- (h) Study of resistance of tows and holding booms under load, using dynamometers.

The Sault Ste. Marie Division of the Abitibi Power and Paper Co. reports the following:

1. A study in sinkage of spruce, balsam, jack pine, birch and poplar covering the effect upon floatability of time of cutting and of different methods of handling. In co-operation with the Woodland Section of the Canadian Pulp and Paper Association.

The Manitoba Division reports the carrying out of observations on the effect of drainage through muskeg on the growth of black spruce, owing to the opportunity arising through railway construction.

ALBERTA.

The Dominion Forest Service maintained a party which was engaged collecting data to investigate the possibility of using the site classification based on the flora as adopted in Finland.

BRITISH COLUMBIA.

The Provincial Forest Branch report the following research:

1. Continuation for the fifth season of investigation of factors controlling natural reproduction of Douglas fir. This year attention was centered on experiments to determine seed distribution quantitatively at varying distances from green timber, and studies on mortality in seedlings during their first season. A summary of the investigation to date is expected to be available late this winter.

2. In 1924 and 1925 nine of the principal blocks of cut-over land in the Douglas fir region were examined and maps prepared giving the fire and logging history, location of green timber left, etc. The first re-examination took place in 1928 and the maps brought up to date. The areas are for observation as regards the progress of natural reproduction, and for use for several phases of investigative work.

3. The annual remeasurement of a considerable number of permanent plots in the Coast region which are concerned mainly with regeneration.

4. Investigations in nursery practice for the production of spruce and Douglas fir stock.

5. The foregoing outline refers to the Coast region. Investigative work related to the Interior forest area is centered at the Aleza Lake Forest Experiment Station, established in 1924. Here the research this season was principally a continuation of the study of the factors controlling the natural establishment of spruce and balsam reproduction, both in the

natural forest and after logging. The work has included experimental cuttings with brush disposal and soil treatment.

Passing from silviculture to mensuration there is reported:

6. The completion of the first yield table for spruce in the Interior, for pure even-aged stands fully stocked.

7. The preparation of a yield table for Douglas fir to replace the preliminary one of 1924, for pure even-aged stands fully stocked.

8. Commencement of a study in the application of these tables to under-stocked stands.

9. Commencement of a study of yield in uneven-aged and mixed stands.

RESEARCH PROJECTS OF WOODLANDS SECTION OF CANADIAN PULP AND PAPER ASSOCIATION CARRIED ON IN 1928.

(These are given separately as some of the work was done in more than one province).

1. Floatability and sinkage loss in spruce, balsam, jack pine, birch and poplar. This investigation is distributed among six pulp and paper companies, McGill University and the Forest Products Laboratories of Canada. the Wayagamack Pulp and Paper Co. Report ready in January, 1929.

2. Use of tractors in logging. Progress report issued.

3. Raising efficiency and stability of woods labour. A beginning has been made in assembling data.

4. Size of wood as related to cost of logging. In co-operation with Progress Report ready in January, 1929, and completion in 1930.

5. Required amount and accuracy of check scaling. Report under way.

6. An investigation of methods of logging on very rough ground.

7. The use of chutes. Report ready in January, 1929.

8. General studies of logging methods with a view to improvements.

9. Culling of pulpwood in the bush. Defective samples are being studied and a handbook on culling is in preparation, to be issued during the year.