PROVINCE OF BRITISH COLUMBIA

DEPARTMENT OF LANDS AND FORESTS

HON. E. T. KENNEY, *Minister* C. D. ORCHARD, *Deputy Minister of Forests*

REPORT

of

THE FOREST SERVICE

YEAR ENDED DECEMBER 31ST

1950

VICTORIA, B.C.
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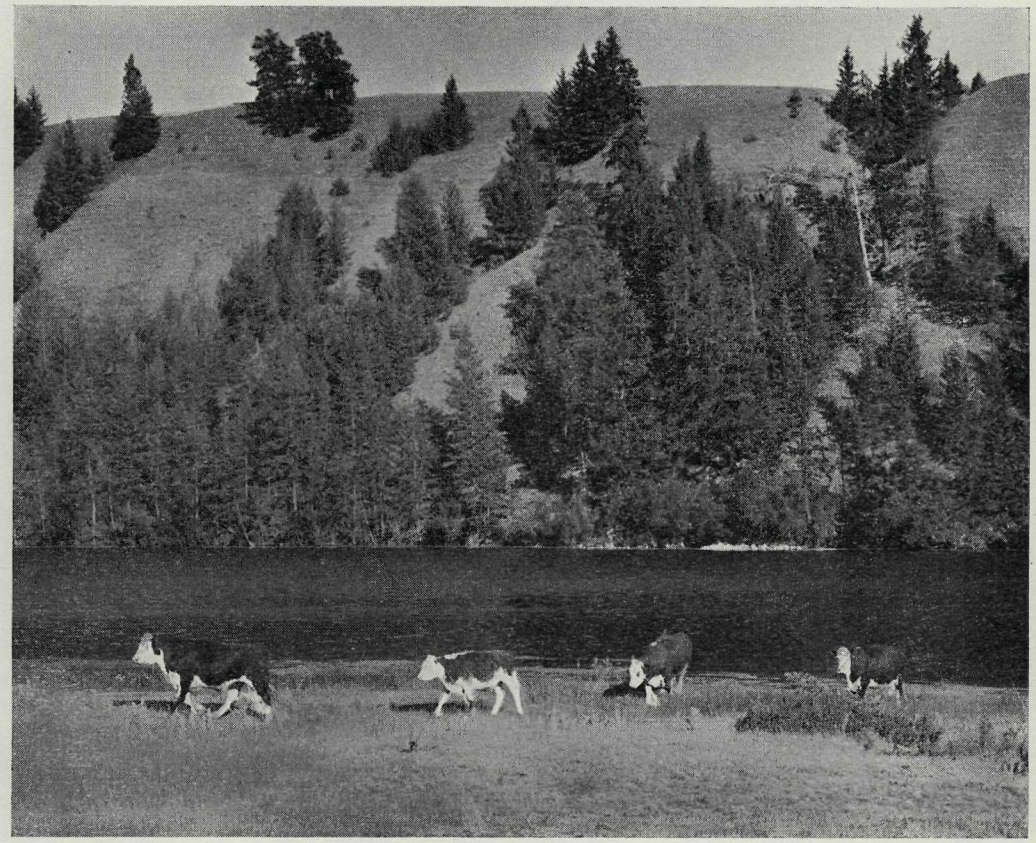
1951



Beef cattle on open grass land, Nicola Valley.

VICTORIA, B.C., March 1st, 1951.

To His Honour CLARENCE WALLACE, C.B.E.,
Lieutenant-Governor of the Province of British Columbia.

MAY IT PLEASE YOUR HONOUR:

Herewith I beg respectfully to submit the Annual Report of the Forest Service of the Department of Lands and Forests for the calendar year 1950.

E. T. KENNEY,
Minister of Lands and Forests.

The Honourable E. T. Kenney,
Minister of Lands and Forests, Victoria, B.C.

SIR,—There is submitted herewith the Annual Report on activities of the Forest Service during the calendar year 1950.

C. D. ORCHARD,
Deputy Minister and Chief Forester.

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REPORT OF THE FOREST SERVICE

Despite a late start, favourable weather in the late summer permitted a record area to be surveyed by standard inventory methods during the year. A total of 4,346,280 acres was surveyed, utilizing a total personnel of eighty-seven on all parties. One new Provincial forest—Kyuquot—was created, comprising 1,865 square miles.

A continuation of the nursery fertility studies indicated a decline in growth at all three nurseries, and serious consideration must be given to a fertilizing programme. Survival studies of nursery stock in the field paralleling fertilizer studies at the nurseries were carried out.

A land-use survey was conducted in the valley of the Silverhope Creek, Klesilkwa River, and Lower Skagit River. Previous site-type studies were broadened in their scope into ecological studies to determine the chief plant associations of a region.

A number of essential buildings were erected at the Aleza Lake Experiment Station, and the nucleus of a permanent staff established. A preliminary working-plan providing an annual cut of 3,500,000 F.B.M. was adopted. A similar plan for the Cowichan Lake Experiment Station was completed.

The results of studies of seed production and dissemination by conifers and in the control of seed-eating rodents were published as research notes or technical bulletins. A variety of volume tables was produced during the year by the mensuration section of the Division.

The severe winter of 1949–50 reduced nursery production by approximately 20 per cent; frost damage to 1–0 and 2–0 stock at both Duncan and Green Timbers nurseries was severe. Seed was sown for a production of 10,000,000 trees in 1942. A total of 6,900,000 trees was planted during the year, with 6,300,000 being placed by the Forest Service on Crown land. The remainder was planted by private companies.

The Douglas fir cone-crop was only fair and hemlock and Western red cedar was poor. However, utilizing mainly the services of teen-age boys under the supervision of a foreman, it was possible to collect 4,600 bushels of fir-cones which should meet nursery requirements for three years.

The first experimental autumn planting with 1–1 yellow pine seedlings in the East Kootenay was completed, a total of 28,000 trees being planted.

Fifty miles of abandoned logging grade was converted to truck-trail and 4 miles of new road constructed. Snag-falling on 11,440 acres was completed.

The major share of development efforts and funds was again expended in Mount Seymour and Manning Parks, with the Vancouver Island parks next in line for attention. As a result, during the year the Mount Seymour Park road has been extended to the Administrative site, and Pine Woods Lodge and overnight accommodation in Manning Park has now been completed. At the end of the year the Division had under its jurisdiction sixty-one Provincial parks comprising over 9,000,000 acres.

The total cut of 4,560,000,000 feet, board-foot log-scale, for all products established an all-time record for forest-resource harvest and, at the same time, achieved a new peak in production values—estimated at $468,371,000. Water-borne shipments exceeded 1949 figures by 320,000,000 feet. Forty per cent of the volume cut was Douglas fir, and over one-third of the whole harvest was obtained from areas under timber sale.

Weighted average bid for stumpage of all species was $5.19 per thousand, an increase of $1.14 (28 per cent) over 1949.

The number of operating sawmills and shingle-mills reached a new maximum of 1,891—double the number existing in 1945.

Six new forest management licences were completed during the year, bringing the total in effect to eight; working-plans for two others are at hand and five other applica-

tions have been approved and reserves established pending completion of working-plans. The first cutting permits issued under the forest management licences were granted during the year. Four public working-circles on Provincial forests have been analysed, with regulation of cut to be initiated in the coming year. Working-plans have been prepared for three farm-woodlot licences.

Activity under the Silvicultural Fund occupied seven crews on forty-two different projects in four of the forest districts.

Revenue collections for the year established a new record at just less than $9,250,000, slightly over $1,000,000 higher than the previous record in 1949.

The forest-protection picture during the year can best be described as "fortunate." A number of periods of hazard build-up occurred but generally were relieved by rains before they became critical. September, which might have proved very bad, had only a limited number of fires due to the absence of the usual lightning-storms. Only in the Peace River section of the Fort George District was the fire season disastrous. In that area, fires, during the third week of September, burned extensive acreages but did little damage to mature-timber values. Campers and smokers caused 35 per cent of the fires, and lightning slightly over 22 per cent. A total of 848,246 acres—more than two and one-half times the average for the past ten years—was burned over. Of this total, nearly 800,000 acres were located in the Peace River section east of the Rockies.

Possible locations for lookouts were examined in 127 cases, and reports, complete with maps, prepared for each site. Locations for eleven primary and nine secondary lookouts were recommended. Approximately 310 miles of existing roads and trails were traversed and mapped.

In view of the complexity of fire-weather studies, work on this phase of fire-protection has been concentrated in the Vancouver District; the number of weather stations recording fire-hazard factors was increased to forty-six. Results fully justify the extensive use of fuel-moisture sticks to determine hazard build-up.

Thirteen primary-action suppression crews were fielded, and these fought a total of 146 fires, holding 131 of them to less than 5 acres in area. Four aeroplanes were available under charter contract for detection-suppression duties. Considerable success has been experienced in parachute-dropping food and equipment to Forest Service crews in inaccessible areas.

The Service was uniformly successful in the acquisition of automotive equipment, tankers, trailers and tractors, road-maintainers, outboards, pumps, and chain-saws. Operations of the Marine Station were seriously hampered during the first four months of the year while the plant was under reconstruction, following the fire of the previous year. Despite this handicap an important volume of work was accomplished in boat construction, overhaul, and refits; in fabrication of lookout buildings, and furniture; and the manufacture of pumps, fire-finders, and other special machined items. Forty-six major building projects were under way during the year, and thirty-six were completed, comprising garages, warehouse and office buildings, boat-houses, and Ranger and Assistant Ranger headquarters.

The Radio Section made steady improvement in the reliability and speed of message-handling; traffic during the year totalled 33,000 messages. Fifty-one new transmitting units were added to the network. Experimental work was undertaken with F.M. on 150 megacycles and in the construction of a new-type light-weight portable transmitter-receiver. By the year's end, total of all types of sets in use in the network was 448.

It has been possible, through the co-operation of the Forest Insect and Forest Diseases Investigations units of Science Service, Dominion Department of Agriculture, to include in this Report an outline of the activities of these two laboratories. The Forest Service deems itself fortunate in having available for consultation and assistance the skilled personnel of both organizations and tenders its thanks for the co-operation received during the year. In the insect field, the spruce budworm and the bark-beetles

at present constitute the more important hazards to forest health; ambrosia-beetle control in felled timber and forest-nursery insect studies were carried out. The forest-disease investigations comprised pole blight in Western white pine, progressive deterioration of wind-thrown spruce, decay in Western hemlock in the Northern Coast and Big Bend regions, Douglas fir root-rot, infection of lodgepole pine by mistletoe, and a study of deterioration in looper-killed hemlock jointly with the Insect Investigations personnel.

The fourth class of students to attend the Ranger School completed its course in the spring of the year. This class was the first to take the expanded nine months' course, and the advantages of the longer period of studies were demonstrated. The fifth class, comprising another twenty students, commenced study in mid-September.

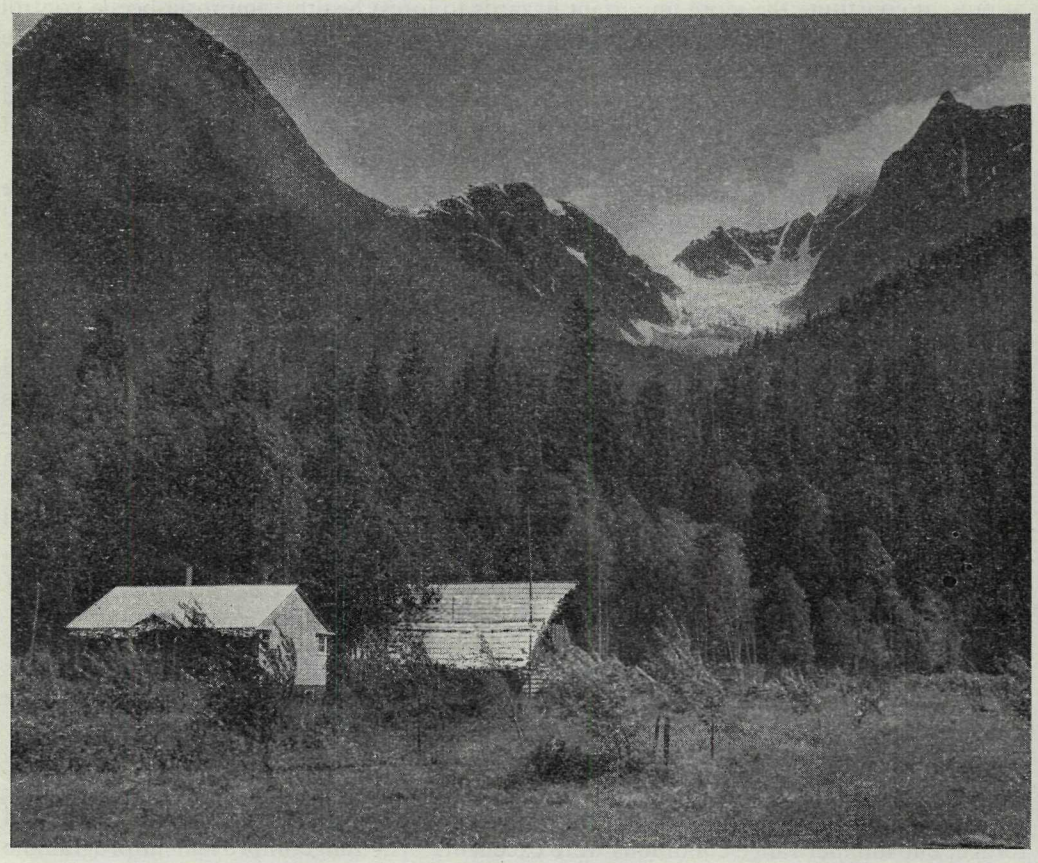
Public education through press advertisements was continued at the level of previous years, but increased funds permitted doubling of the radio-broadcasting programme. There was an extensive expansion in the number and variety of publications produced and in the photographic services provided. Three colour-and-sound motion-pictures were produced for the Forest Service, and work commenced on a film for the Topographic Survey Division of the Lands Service. A series of school lectures was initiated in co-operation with the Canadian Forestry Association.

Exhibits were placed in three major exhibitions in the Vancouver area and two rural fairs. Additional protection-signs for highway display were procured and distributed, together with a selection of coloured posters. Traffic in the Service library was heavier than in any previous year.

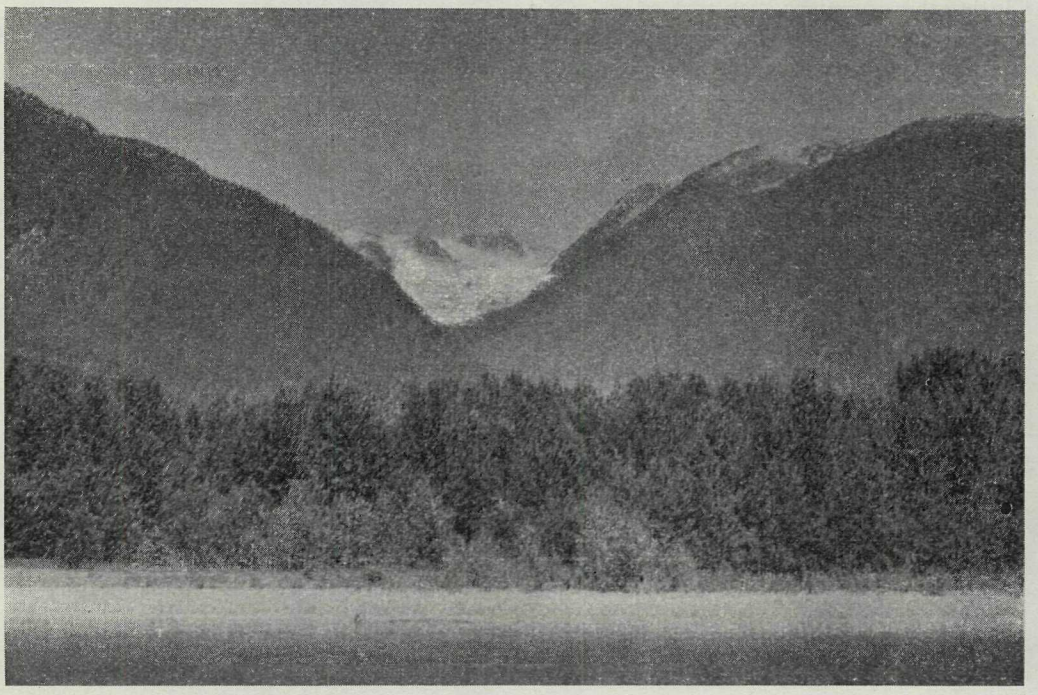
Grazing administration duties during the year were particularly heavy. Early in the year a revision and consolidation of Grazing Regulations was accomplished, and fees placed on a sliding scale governed by the ratio of average live-stock prices for the immediately preceding year to average prices for 1939.

Despite the severity of the weather during the winter of 1949–50, an adequate supply of hay reduced the losses of stock to only a little more than an average figure. Forage-growth in the spring was late, and overly dry conditions militated against good fall forage, but summer range conditions were excellent. The range-improvement programme during the year was satisfactory. Altogether 561,472 acres of range were reconnoitred during the summer.

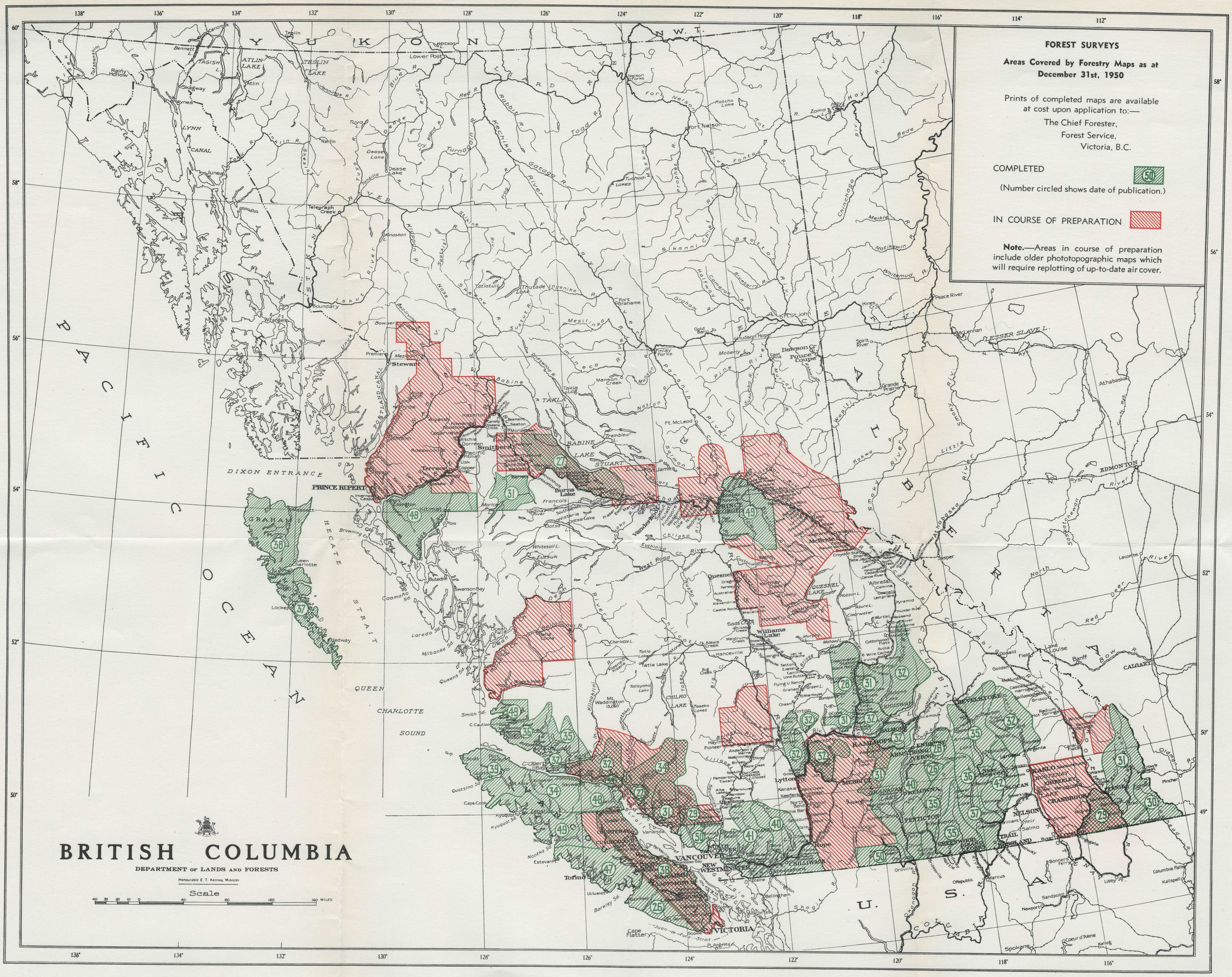
Reports of the various phases of Forest Service work are embodied in greater detail in the ensuing pages, together with numerous statistical tables.



Bella Coola River valley.



Nass River valley.

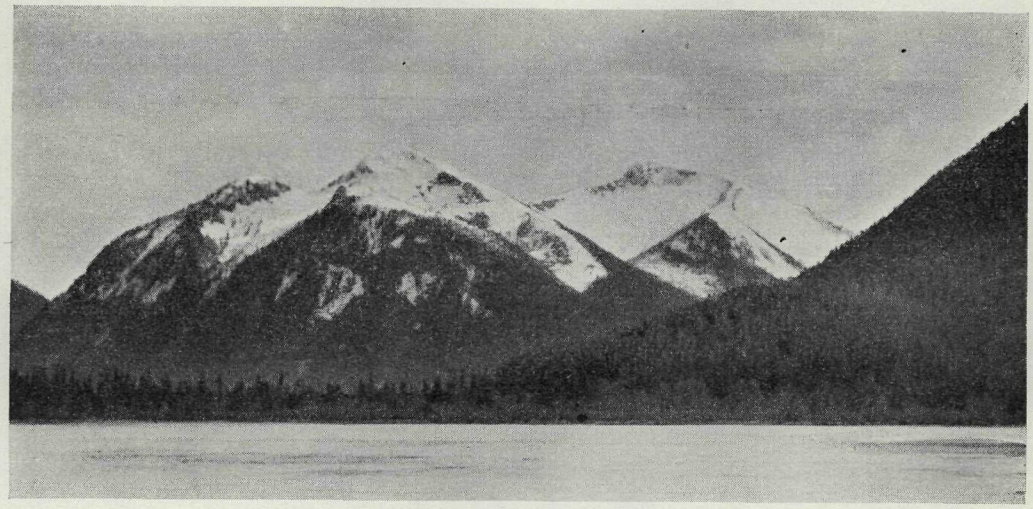

FOREST SURVEYS
Areas Covered by Forestry Maps as at December 31st, 1950
Prints of completed maps are available at cost upon application to:—
The Chief Forester,
Forest Service,
Victoria, B.C.
COMPLETED
(Number circled shows date of publication.)
IN COURSE OF PREPARATION
Note.—Areas in course of preparation include older phototopographic maps which will require replotting of up-to-date air cover.
BRITISH COLUMBIA
DEPARTMENT OF LANDS AND FORESTS
Honourable E. T. Kenney, Minister
Scale
Y U K O N
N.W.T.
PACIFIC OCEAN
DIXON ENTRANCE
QUEEN CHARLOTTE SOUND
HECATE STRAIT
PRINCE RUPERT
Terrace
Kitimat
Smithers
Burns Lake
PRINCE GEORGE
McBride
Quesnel
Williams Lake
Lytton
Hope
VANCOUVER
NEW WESTMINSTER
CHILLIWACK
VICTORIA
KAMLOOPS
SALMON ARM
ENDERBY
ARMSTRONG
VERNON
KELOWNA
PENTICTON
GREENWOOD
GRAND FORKS
NELSON
TRAIL
ROSSLAND
SLOCAN
NEW DENVER
KASLO
KOOTENAY LAKE
KIMBERLEY
CRANBROOK
FERNIE
REVELSTOKE
EDMONTON
CALGARY
Banff
Lake Louise
Jasper
Peace River
Fort Nelson
Fort St. John
Dawson Cr.
Prince Rupert
U. S. A.

FOREST ECONOMICS

FOREST SURVEYS

A satisfactory area was surveyed during the 1950 season, despite the difficulties encountered during May and early June due to the snow, which remained until an unusually late date. However, the weather during the latter part of the summer was especially favourable, and the field parties more than made up for the time lost earlier in the season. The total personnel of all parties numbered eighty-seven, and standard inventory surveys were completed on 4,346,280 acres, as follows:—

	Acres
Powell survey	903,680
Skeena survey	988,780
Upper Fraser survey	748,000
Princeton-Merritt survey	880,800
Bella Coola survey	438,500
Saanich Peninsula	121,520
Strathcona Park	265,000
	4,346,280



Skeena River valley.

In addition, detailed cruises were made for five separate projects, involving a total area of 15,670 acres.

Copies of the finished maps are made available to the public as soon as completed and, for the assistance of those interested, there is included with this Report a key-map on which is indicated the areas for which prints may be obtained on request, together with the areas for which tracings are being prepared. In 1950 the equivalent of thirty-two new maps were draughted.

Timber estimates are being prepared for such major regions as the Upper Fraser, Skeena, Princeton-Merritt, Sechelt, Powell, and the Esquimalt and Nanaimo Railway land grant, and will be published as surveys are completed.

PROVINCIAL FORESTS

Only one new Provincial forest was created in 1950. The Kyuquot Forest, comprising 1,865 square miles, was added to the forest reserves located throughout the lower coastal region. There were no boundary adjustments in any of the other forest reserves,

but, statistically, it was found that an error was being made in showing the Glacier Scenic Forest as a separate entity when it had been included with the Upper Arrow Forest years ago. The records have been changed accordingly.

The revised summary of the Provincial forests to date is as follows:—

Class of Forest	Coast Region		Interior Region		Total	
	Number	Area (Sq. Mi.)	Number	Area (Sq. Mi.)	Number	Area (Sq. Mi.)
Productive	25	18,101	28	21,411	53	39,512
Scenic	----	----------	1	127	1	127
Research	4	4	1	28	5	32
Totals	29	18,105	30	21,566	59	39,671

PERMANENT STUDY-PLOTS ESTABLISHED AND IN USE AS AT DECEMBER 31ST, 1950

Description of Project	Number of Plots Project	Gp.
Growth and yield studies—		
Coast forest types	559	
Southern Interior types	184	
Central Interior types	185	
	—	928
Silvicultural studies—		
On cut-over land—		
Seed dissemination from standing trees	8	
Survival of seed-trees	4	
Artificial seeding	7	
Growth of exotic trees	2	
Competition between broom and Douglas fir	1	
In young stands—		
Thinnings	11	
Prunings	8	
Christmas-tree cuttings	1	
In mature stands—		
Selective cutting	4	
Slash-disposal methods	6	
	—	52
Total number of plots	-----	980
Regional studies—	Number of Plots	Acres
Natural regeneration in representative districts—		
Alberni, Vancouver Island	1,200	4.8
Cowichan Lake, Vancouver Island	600	6.0
Alouette Lake, Fraser Valley	500	5.0
Cumshewa Lake, Queen Charlotte Islands	80	0.1
Totals	2,380	15.9

FOREST RESEARCH

Nursery Fertility Studies

The annual inventory of seedlings shows a decline in growth in all three nurseries. The following table shows data for Douglas fir. At Duncan there are two soils producing quite distinctive seedlings. The fill soil occupies areas of better drainage in which the surface soil is underlain by gravel, or under which tile drains have been laid and the ground levelled by filling with soil from elsewhere on the property. The normal and fill soil, hence, have been sampled separately. The figures in parentheses are for the last crop grown in the same field and are for 1947.

	Green Timbers	Quinsam	Duncan	
			Normal	Fill
Length of top (cm.)	9.9 (12.9)	14.0 (21.2)	23.6 (27.9)	13.8 (21.1)
Weight per seedling (gm.)	0.46 (0.80)	0.98 (1.64)	2.91 (4.34)	1.23 (2.10)
Top to root ratio	2.40 (1.51)	3.03 (2.43)	3.25 (2.46)	2.72 (2.19)
Number of secondary roots	11.3 (8.9)	11.4 (10.0)	18.6 (10.4)	14.00 (7.3)

A consistent decline in length of top and weight per seedling will be noted in all three nurseries, and this decline has been found to be statistically significant. This is not a serious situation at Duncan, for the average seedling is almost too large for easy planting. This year's fill seedlings are perhaps ideal. At Quinsam the growth is satisfactory, though not quite as robust as at Duncan. Further declines, however, should be checked. At Green Timbers the situation is critical. The seedlings are now down to a minimum size for field planting. Serious consideration should be given to a fertilizing programme.

It will be noted in the preceding table that the ratio of top to root has increased, although the number of secondary roots has also increased. It must be assumed that the roots are finer and shorter than in the previous crop. This suggests that with declining fertility the natural tendency is for the seedling to produce many fine roots to obtain nutrition, instead of fewer, larger roots when no scarcity prevails. This supposition is not borne out in fertilizer trials.

At Green Timbers a comprehensive fertilizer trial started in 1949 has been evaluated on the basis of 2–0 Douglas fir seedlings produced. The experiment was laid out as a Latin square of four fertilizer mixtures and a check. The following table summarizes the results:—

Commercial Fertilizer Mixture*	Length of Top	Weight per Seedling	Ration of Top to Root	Number of Secondary Roots
	(Cm.)	(Gm.)		
7–11–0 (blood and bone)	10.8	**0.64**	**2.5**	**13.8**
0–12–20	9.2	0.46	2.0	12.3
2–16–6	9.9	0.47	2.3	12.0
8–10–5	10.8	**0.65**	2.2	**14.5**
Check	9.7	0.46	2.1	11.2

* The numerical designation of commercial fertilizers refers to the percentage of nitrogen (N), phosphorus (P), and potash (K).

The bold-face figures show statistically significant increases over the check. It will be noted that two fertilizer mixtures have shown up well—7–11–0 and 8–10–5.

The same fertilizers were applied to a green manure crop of rye. All fertilizers produced a better crop than the check, with the 8–10–5 showing up best. The following figures show the height of the rye before ploughing in: 7–11–0, 20 inches; 2–16–6, 24 inches; 8–10–5, 36 inches; 0–12–20, 26 inches; check, 18 inches.

Other fertilizer trials are in progress at Green Timbers and Quinsam.

Field Survival of Nursery Stock

Paralleling fertilizer trials in the nursery are survival-plots of fertilized seedlings. The object is to determine if well-developed seedlings maintain their thriftiness when planted out as 2–0 stock.

The fertilized nursery stock from Green Timbers, reported on in 1948, was set out in an experimental plantation in the Sayward Forest. After two growing seasons the following mortality rates were found:—

Fertilizer Treatment	Mortality (Per Cent)	Standard Error
NK	1.7	0.4
NPK	3.4	0.8
N2PK	4.3	0.9
NP2K	5.5	0.9
NP	5.5	1.7
2NPK	6.6	1.3
PK	6.6	2.1
Check	7.3	1.9

Seedlings from all fertilizer treatments showed a greater survival than the check or unfertilized seedlings. The NK (nitrogen and potash) fertilizer was the only treatment showing a significant increase in survival. This was the treatment that produced the best root-development in the nursery.

Other plantations have been set out in the same area for various experimental purposes. The results are summarized as follows:—

(1) All seedling stock, regardless of nursery or size of seedling, have a high survival rate (90 per cent or over) if carefully planted at the right period.
(2) The small Green Timbers seedlings (length of top less than 10 centimetres) have the highest mortality.
(3) Fertilizers will increase the size of the seedlings and their ability to survive.
(4) Frost-killing of terminal and upper buds in the nursery results in a marked increase in mortality when planted out in the field.
(5) Large stock suffers most from frost-damage in the nursery and also suffers high mortality when planted out.
(6) Large stock suffers from grouse-damage more than small stock.

This summary is by no means final. It does suggest, however, that care in planting is by far the most important factor in reforestation. The results also show that extremely large or small stock are undesirable and that hardening-off in the nursery is important.

Land-use Survey

A land-use survey was made of the valley occupied by Silverhope Creek, the Klesilkwa River, and the Lower Skagit River. This is an area that extends in a southeasterly direction from about 3 miles west of Hope in the Lower Fraser Valley to the International Boundary—a distance of 35 miles.

The valley varies from a few hundred feet to about a mile in width. The elevation rises from about 100 feet at the mouth of the Silverhope Creek to 1,900 feet at the divide between Silverhope Creek and the Klesilkwa River. The Lower Skagit and its tributary, the Klesilkwa, flow through a comparatively level valley. The elevation at the International Boundary is 1,700 feet. The entire valley is bounded by steep mountains rising from 5,000 to 7,000 feet in elevation.

The soils of the Silverhope Valley are rough, stony, and of no agricultural value. In the Klesilkwa Valley there is a limited area of alluvial soils, with perhaps from 700 to 1,000 acres potentially arable. Part of this is swampy and would require drainage. The whole area is subject to flash floods in spring-time.

In the Skagit Valley there is a large acreage of potentially arable alluvial soil. This area, however, is to be flooded by a dam across the Skagit River in the State of Washington.

The conclusions of this survey are that the flooding of the lower part of the Skagit River eliminates the arable land that would have justified the exploitation of the Silverhope, Klesilkwa, and Skagit area for agricultural use. The remaining potentially arable land in the Klesilkwa Valley is insufficient in area to justify the maintenance of a public road, schools, etc., necessary for a settlement. It is, therefore, in the public interest that Crown lands be withheld from sale unless a public road is to be maintained for purposes other than the settlers' convenience.

Ecological Studies

During the past year the original site-type studies were broadened into regional ecological studies. This work was undertaken in co-operation with the Faculty of the University of British Columbia.

The objective was to determine the chief plant associations of a region and describe them in terms of their tree cover (species, vigour of growth, succession, etc.), and in terms of the lesser vegetation by which the associations may be recognized. The rela-

tionship between associations was studied by observation and by means of records of temperature, evaporation, soil-moisture, chemical analysis, etc., from plots selected for this purpose. In this way the macro-climate of the climax vegetation might be recognized, and the effects of micro-climate estimated in terms of variations found in the forest-cover.

From such basic information the effects of opening up large tracts by logging and the effects of fire may be estimated in terms of changes in micro-climate and soil, and this in turn interpreted in terms of new successions, which may or may not lead to the original forest associations. At the present time a report on these studies is being compiled.

FOREST EXPERIMENT STATIONS

Aleza Lake

Development of the Aleza Lake Forest Experiment Station proceeded through the past year. A modern residence for the forester-in-charge and basic landscaping of the new building-site were completed. Older buildings were repaired and redecorated. One new vehicle was added to the establishment, and re-equipment in terms of tools, machinery, and forestry instruments progressed.

Development of a permanent staff was initiated with the employment of a foreman. Temporary staff for the field season consisted of a forester-in-training, two forestry students, six to eight high-school students, and a varying number of daily-rate men engaged in various forestry and building projects. During the months of July and August an average of twenty-five men was fed daily in the camp cook-house. As in previous seasons the Upper Fraser Forest Survey party used the station facilities as a base for its summer operation.

The high-school student summer employment plan, whereby a certain emphasis was placed on instruction pertaining to forestry as well as on routine work, was successful. The students had an enjoyable summer, learned something of practical forestry, and contributed substantially to the progress of nearly all projects.

Based on cruise and sample-tree data taken in the 1949 season, a preliminary working-plan was outlined for the experiment station. Total merchantable volume for the area approximates 57,000,000 cubic feet and the annual allowable cut has been set at 830,000 cubic feet over the first decade. The major problem of management is to convert a mature and fairly static forest into a growing unit. Overmature elements will be eliminated. Field tallies in virgin forest indicate a general all-sized stem distribution with most trees in the lower diameter classes, while residual stands on old logged areas show good growth characteristics. Marking will precede all cutting in the immediate future, and emphasis will be placed on retaining a satisfactory reserve stand. Along main roads, where access is permanent, cutting will be light. Early return will be practical for salvage in these areas if mortality (wind-throw) is excessive, and for relogging at the end of a short cutting-cycle if growth is reasonably rapid. Less accessible areas, which constitute the bulk of the forest at present, will be logged more heavily, with no intent of returning before the end of a 30–60-year period. Minimum satisfactory stocking after logging is considered to be in the vicinity of 100 spruce stems, with 30 to 50 between 6 and 18 inches D.B.H., supported by several hundred balsam stems of varying size.

Through co-operation of the Air Survey Division of the Lands Service, a multiplex map with contours to 20-foot intervals was produced for some 1,500 acres of forest in the north-west corner of the reserve. Ground control had been obtained the previous season by station personnel. From a series of relatively low-level aerial photographs, the present map will be extended to cover the whole of the reserve area. Construction of a contour map from photographs for forestry purposes is experimental. Certain diffi-

culties, such as density of crown canopy, provide technical problems, but the new map has proven useful already in the consideration and planning of logging operations. Local conditions, in which wet ground and even swamp occur under the forest canopy, limit its use in road location, but, nevertheless, ground reconnaissance can be considerably reduced by eliminating routes and areas on the map in which minimum road specifications in per cent of grades cannot be achieved.

Location of the experimental area's main access road, designed to provide the reserve with 7 miles of main road, was begun in midsummer. The route taps gravel deposits on the Bowron River. Location was completed in November and right-of-way clearing commenced immediately. The latter operation, making use of two caterpillar tractors, is of particular interest in that few forestry projects have been carried out in the region during the winter season. The equipment was operated successfully, and the project has proceeded rapidly. A good volume of logs (500,000 F.B.M. at December 31st, 1950) has been decked along a winter road for sale to local industry. Returns from logs may defray the cost of the operation. Right-of-way clearing extends 50 feet on either side of the road centre to allow rapid thawing of snow and drying of the road in spring and summer. Final grading will be commenced in the summer of 1951 and completed with gravelling the following winter. According to the station working-plan, the road will be extended annually until some 15 miles of main road with necessary tributaries are available for logging operation. A permanent road system around which can be planned various forms of partial-cut management is the ultimate objective.

A report on the effects of tree-length skidding in the spruce-balsam forest type was based on a study carried out in the autumn of 1949. Heavy damage to the residual stand was indicated where tree-length skidding was practised under summer conditions. In general, all of the logging examined was prohibitive to early second cuts, and higher standards in terms of residual stand are recommended. Further recommendations of the report were:—

(1) Early definition of silvicultural aims and objectives for the spruce-balsam forest type.
(2) Determination of specific objectives in terms of the residual stand for each timber sale based on pre-examination of the stand, and requirement that the operator fulfil the defined objective.
(3) Elementary operational planning in terms of silvicultural aims on each logging chance.
(4) Use of an educational approach to further the development of better woods practice.

During the 1950 field season a series of total stem cruises was made in several of the forest-type classifications occurring on the reserve area. All trees, of all species, over 7 inches D.B.H. were tallied and samples taken of the smaller material. The types examined were:—

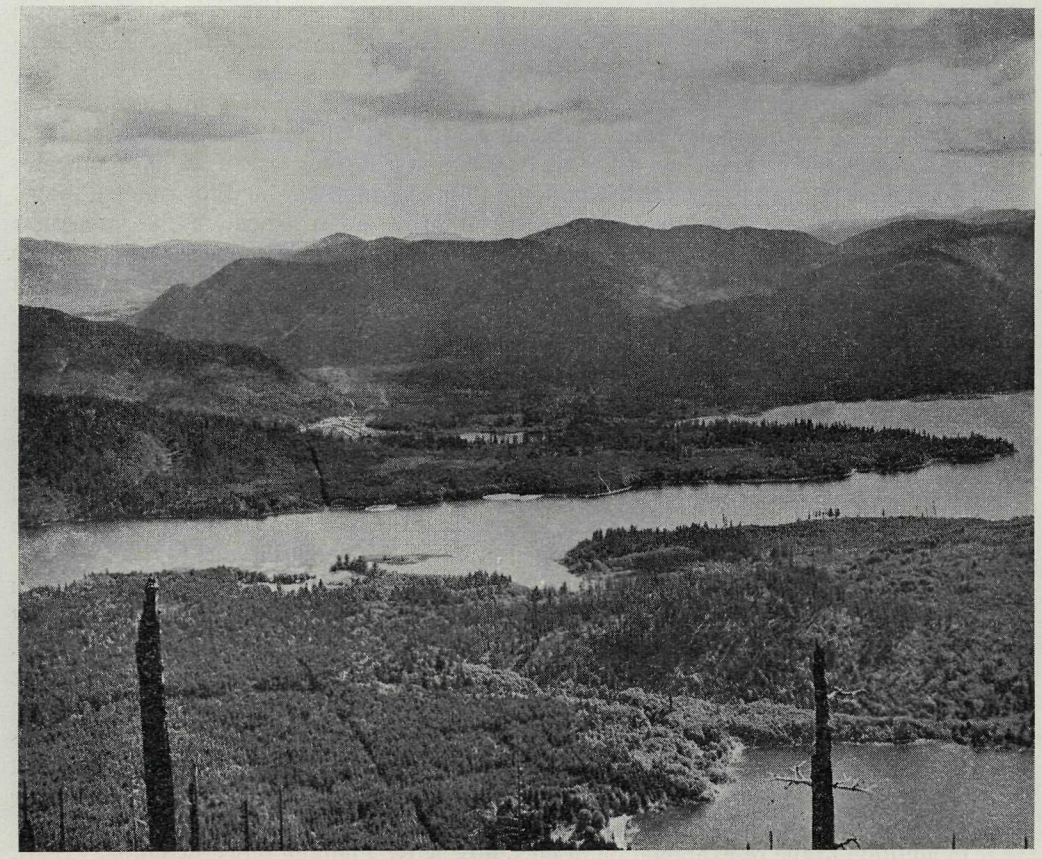
(1) Unlogged mature timber, 320 acres.
(2) Recently logged area which had been marked prior to cutting, 160 acres.
(3) Areas logged twenty-five and twenty-nine years previously, 400 acres approximately.

The unlogged mature timber was cruised in the course of marking for logging. The recently logged area was examined to supply a basis for future examinations, to determine the early extent of wind-throw, and to assess any reproductive tendencies. In the older logging, numerous sample trees were analysed to relate past and current growth in the existing stand, and to develop reasonable bases for growth forecasts in the immediate future. Various strip- and plot-cruises were made on each area, which will provide comparisons in sampling reliability. Reports are in process of preparation on the above projects.

Cowichan Lake

A comprehensive working-plan has been completed, covering past, present, and future activities (for next ten years) of the Cowichan Lake Experiment Station.

Silvicultural research at the station included work on established studies to determine the best method of Douglas fir stand-improvement.



Cowichan Lake Experimental Station and Ramsay Point Forest from 3,000 feet on Meade Mountain to north.

A fourth thinning was made on four plots which have been under treatment since 1929 and are now 39 years old.

The case-history of a low-thinning plot in comparison to an untreated plot is illustrative of present volume production. Thinned and unthinned areas have produced a gross volume of 7,500 and 7,900 total cubic feet, inside bark, respectively. In terms of gross mean annual production, this represents 193 and 202 cubic feet per acre per year. In the control-plot 9.2 per cent of the present net standing volume has been lost through mortality, and unrecovered, but the net mean annual increment is at 187 cubic feet per acre per year and is being put on 730 trees averaging 10 cubic feet (inside bark). In the low-thinned plot the standing volume is 4,500 total cubic feet per acre with a net mean annual increment of 185 cubic feet (inclusive of all thinning volumes from time of first thinning). Subsequent to the first thinning at 20 years, 59.5 per cent of the standing volume has been removed; of this, 87 per cent has been cut in two operations since 1947. Three years after the 1947 treatment, canopy closure had been restored sufficiently to permit a further cut of 22 per cent by volume so as to produce a residual

stand of 312 trees averaging 14.5 cubic feet per tree inside bark. Six per cent of the present standing volume on the thinned plot has been mortality. Two per cent was recoverable during thinning operations, and the remaining 4-per-cent loss was due to suppression of small trees after overly light thinnings which failed to forestall mortality when the plot was between 20 and 25 years old.

Since 1946 a study has been made of the instrumental measurement of radial growth. The aim was to develop a sensitive measure with which to compare growth response to various conditions and to determine features of seasonal growth. The practicability of the method in stands under cultural treatment was also tested. The history of this experiment, results, and use of the dial indicator were reported in Forest Service publication T. 33, " Precision Measurement of Radial Growth and Daily Radial Fluctuations in Douglas Fir." Subsequent to this publication a further test of the dial indicator was undertaken in conjunction with a periodic thinning in crown- and low-thinned plots. The dial indicator was used to provide a quantitative measurement of the immediate radial response each day for one week following treatment early in the growing season and to compare the magnitude of this daily response to the magnitude as measured at the end of the growing season.

The result of this test indicated that the response, within twenty-four hours, to a crown-thinning amounted to a 71.3-per-cent increase in the rate of growth of the treated stand. On the fourth day following treatment, this increase had fallen to 18.9 per cent, which was followed by a sudden decline on the seventh day to 3.8 per cent. By contrast, the immediate response in the low-thinned plot was neither so immediate nor so violent. Within the first twenty-four hours no measurable response was recorded by the dial indicator. By the fourth day, however, an increase of 19.8 per cent was evident—an increase which was maintained until the seventh day. Although these readings undoubtedly indicated immediate radial increases, varying in vigour and time of response with the type of thinning, it was found that the magnitude of this immediate increase was not correlated to the magnitude of the increase measured over the whole season. Therefore, on the basis of this small test, reliance cannot be placed on the assumption that the immediate response from one to seven days after thinning is a measure of the increase at the end of the growing period. It is suggested that discrepancy in the correlation was due to decrease in root competition and an increase in transpiration, thereby making it possible for a greater volume of water to be drawn up the stems of the trees under observation.

In addition to the re-examination of currently active thinning-plots, two other experiments were commenced. A series of five plots, each of 1 acre, was established to study the effect of very heavy low thinnings on medium (Site Indices 110–140) sites of Douglas fir, while a small-scale pruning and debudding experiment was initiated in a 10-year-old plantation of Douglas fir.

Following a reconnaissance of a 1,200-acre Provincial forest reserve in the Quatsino Sound region this year, it is intended to extend thinning studies to include pure hemlock (*Tsuga heterophylla* (Raf.) Sarg.) stands in the near future.

A local volume table for Douglas fir prepared for the experiment station in 1945 was revised this year to incorporate additional measurements on 140 felled trees.

SILVICULTURAL STUDIES

The factors of seed production by trees and stands of commercial species have been studied in the Douglas fir region and discussed from time to time in these Annual Reports. The results of this work, in so far as the dissemination of seed and reproduction from mature stands is concerned, have now been brought together in Forest Service publication T. 35, entitled " Seed Production by Conifers in the Coastal Region of British Columbia Related to Dissemination and Regeneration."

Further study of the problem of controlling the loss of Douglas fir seed in the ground by treatments to protect the seed from the white-footed mouse failed to uncover any completely effective repellent. Preliminary experiments in control by poisoning are now being conducted, using the rodenticide sodium fluoroacetate, commonly known as Compound 1080. In Oregon and Washington it has been found very effective against the white-footed mouse. In the Sayward Forest an area was poisoned according to methods developed by the United States Fish and Wildlife Service. Representatives of the Provincial Game Department examined the area after poisoning, but no harmful effects to other wild life were observed at any time. Results were definitely encouraging. Douglas fir seed sown in the spring, after poisoning, were undisturbed while germinating. The results of this experiment have been published in Forest Service Research Note No. 17. In November an area of 32 acres was effectively poisoned and seeded at Alberni, although there was a snowfall on the second day. The 1080 control eliminated a large mouse population, and trapping one month later did not catch any mice.

Tests in the spring with pelletted seed showed that the coating delayed germination. The British Columbia Research Council laboratory has continued to work on this problem, and seed with an improved coating is now being tested for germination in the field. Through co-operation of the MacMillan Export Company, one test of germination value is being made at its A.P.L. Division, near Alberni, on the poisoned area mentioned above. An ecological study of the rodent concerned has been published in the Forestry Chronicle, 26:115–126, 1950, "The Life History of the Deer Mouse." Previous work on this problem has been brought together in Forest Service publication T. 31, "Direct Seeding Experiments in the Southern Coastal Region of British Columbia, 1923–1949."

At Cowichan Lake Experiment Station the cone-crop on coniferous trees was poor in 1950, following the intermediate-sized crops of 1948 and 1949. The current crops on these trees, which are examined every year, are shown in the table below:—

TYPE OF CONE-CROP

Species	Good	Fair	Poor	*Nil*	Number of Trees
Douglas fir	----	9	29	45	83
Balsam	----	----	2	11	13
White Pine	----	----	1	8	9

Cone production was also measured on seven other plots on Vancouver Island. At Englishman River and Hillbank the crop on scattered seed-trees was fair to good. On the scattered trees at Sahtlam, Qualicum Bay, and Elk Falls Park, the crop was poor, while in closed stands at Cameron Lake and McCoy Lake there was no crop.

Further work was done this year on the cone-maturity study to determine the most favourable time for the collection of Douglas-fir cones. As reported last year, the specific-gravity test gave no indication of seed maturity. Details of the method and the results are given in Forest Service Research Note No. 18. This year, embryo-length was used as a guide to seed maturity. From July 20th to September 9th cones were collected at intervals from eight trees in the Hillcrest area where there was a fair to good cone-crop. Seeds from each tree were examined and embryo-length and seed-length measured. The ratio of embryo-length to seed-length rose steadily from 17.8 per cent on July 20th to 75 per cent on August 20th and thereafter remained at that level. Germination of the seed rose from 2.5 per cent to 83.4 per cent over the same period. Germination of the seed collected on August 10th was 24.3 per cent, indicating a rapid increase in germination between August 10th and 20th, culminating in a capacity of 83.4 per cent at the later date, which coincides with the attainment of full size by the embryo. This evidence shows that embryo-length is a reliable and simple guide to seed maturity in Douglas fir. Another germination test will be made in the spring of 1951 to check these results.

In the fall of 1949 an examination was made of seventeen trees to test the bud-counting method of forecasting cone-crops. Ten trees were near Skutz Falls and seven at Langford. Unfortunately, the trees selected had few female buds and so gave little data on which to judge the method. The results did show that the following year's fruiting buds can be disinguished quite accurately in the previous fall. However, owing to variations between individual trees and between adjacent areas, a very large sample, entailing a disproportionate amount of work, would be required to get such an early estimate of the next year's cone-crop.

An experiment was undertaken to test the germination of Douglas fir seed by chemical methods. During the war, 2–3–5 triphenyl tetrazolium bromide, now manufactured under the trade-name of " Grodex," was developed to test seeds of cereals, peas, and vetches. It has since proved suitable for testing the seeds of a number of tree species. The experiment was set up as follows: (1) Grodex test, 1,000 seeds (10×100); (2) Selenium test, 1,000 seeds (10×100); (3) unstratified seed, 2,000 seeds (20×100); (4) stratified seed, 1,000 seeds (10×100). Grodex tends to give a high germination value. In this test the figure was 3.1 per cent higher than the real germination of the stratified and unstratified seed. The method has much to recommend it. The test is quicker and safer than the Selenium test. (Grodex is non-toxic, whereas sodium biselenite is poisonous.) Grodex gives very consistent results; however, the indicated germination value being an overestimate of actual germination, further work is required to find the necessary conversion factors. An experiment has been started to find the most satisfactory storage conditions for Douglas-fir seed. Samples will be dried to different moisture contents and stored in sealed containers. Germination tests will be made each year for five years to determine the conditions under which the seed best retains its viability.

There is increasing appreciation of the need for improving the quality and the locality-record of seed collected for domestic and export use. Douglas fir is particularly sensitive to site conditions, and a relatively small difference in elevation between seed-source and the location of plantations for stock from the seed of that source may have considerable bearing on the adaptability and productivity of the stock. A project has been started which aims to select the better young stands for cone collections in order to regulate both the quality and provenance of seed used for reforestation purposes.

In view of the large and increasing area of cut-over land reforested by the Forest Service, a study has been initiated to make periodic examinations of the older plantations. The objective of these examinations is to record the present condition and future needs for their management. The working-plan is based on a preliminary survey made this year.

The exotic plantations near Alouette Lake were examined during the summer. Of the coniferous species planted, *Larix leptolepis* and *Larix dahurica* both maintain good height growth and survival. Average dominant height of *L. leptolepis* is 38 feet and of *L. dahurica* 49 feet (age, 24 years), survival being 83 and 65 per cent of original numbers planted. *Sequoia gigantea* which, up till the last examination in 1948 was healthy and growing satisfactorily, has suffered heavily from the severe cold of the last two winters. The foliage to a height of 15 feet has been killed and only the top few feet remain alive. The red oak, *Quercus borealis,* and the sugar maple, *Acer saccharum,* both maintain good height growth and vigour, but the American ash, *Fraxinus americana,* has lost much of its original vigour and good form, and many trees show heavy insect-attack.

The experimental pruning at Green Timbers was carried a stage further. The plantation is now 21 years old and had been pruned to 13 feet in 1946 (Forest Service Report, 1947, page 20). In 1950 the average D.B.H. of the trees in the pruned plot was 5.7 inches and the average height 42.7 feet. The trees were pruned to 20 feet in this operation, using hand-saws and ladders. The average pruning time per tree, based on 122 trees, was 4.5 minutes. The ladders were heavy and awkward to move about in the stand and, on the average, three men pruned 124 trees in an eight-hour day. Another plot was

Wind-thrown second growth following infestation by **Poria weirii.**

pruned up to 20 feet in one single operation. The average D.B.H. of the trees in this plot was 5.77 inches, and the average height was 43 feet. The average time taken to do the pruning on these trees was 7.5 minutes. From a comparison of these two plots it will be possible to find out whether it is more economical to prune to 20 feet in one stage or in three stages and, later, to find out if there is any difference in the quality of the wood as a result of the two methods of treatment.

The case-histories of restocking on logged and burned coastal types in the Cowichan Valley and near the Alouette River were brought up to date with examinations to complete records for a twenty-year period. This study is being analysed, and a report covering the results is being prepared.

A study was initiated to determine the composition, development, and ecology of regeneration in the root-rot openings in young Douglas fir stands. Work on this was carried out in the Cowichan Lake Experiment Forest and in the Alberni district.

MENSURATION

The programme of re-examination of permanent growth-study plots was maintained with the remeasurement of fifteen standard plots, and five empirical series involving eighty sub-plots, to total ninety-five plots.

The permanent plots are giving data which cannot be obtained by any other method. They indicate that, once a stand has its canopy complete, the productive capacity remains about constant for many decades. The mortality tends to increase with age, causing a reduction in net periodic volume. After 90 or 100 years some stands begin to break down due to wind-throw or some other natural agency. It is difficult to find stands beyond this age which meet the standards for normal tables. The few well-stocked stands beyond this age are the survivors of younger well-stocked stands, many of which have broken down. If the yields are based only on these remaining stands, they will be regarded with suspicion, especially for the older age-classes.

Volume Tables

Miscellaneous volume tables were prepared during the year. Site-class board-foot tables for mature Douglas fir, cedar, and hemlock especially adapted to grade-cruising by seasonally employed cruisers were compiled. These tables give the volumes of each log in position for trees classified by 6-inch D.B.H. classes and stands in 20-foot site-index classes as indicated by their average maximum heights. The volumes are given in British Columbia Rule for 32-foot logs. A field test this summer was satisfactory.

The following total cubic-foot volume table for black cottonwood has been prepared from data supplied by the Laboratory of Forest Pathology, Science Service, Dominion Department of Agriculture. The volumes for trees beyond the range in diameters and heights blocked out in the table are extensions and should be used with discretion.

Reclamation of opening made by infection of **Poria** root-rot and subsequent wind-throw of 35-year-old Douglas-fir trees. In a few years a luxuriant growth typical of the site covers the ground while small released cedar, hemlock, and balsam takes possession.

TOTAL CUBIC-FOOT VOLUME TABLE—BLACK COTTONWOOD (*POPULUS TRICHOCARPA*)
(Gross volume of entire tree in cubic feet.)

D.B.H.	Total Height												Av. Total Height	Av. Vol.	Number of Trees	D.B.H.
	60	70	80	90	100	110	120	130	140	150	160	170				
8	8	9	10	12	13	14	16						70	9	4	8
10	12	14	16	18	20	23	25	27					81	17	3	10
12	18	21	24	27	30	33	36	39					90	27	5	12
14	24	27	32	37	40	44	48	53	56				98	40	2	14
16	31	36	42	48	53	58	63	68	73	78			104	55	11	16
18		46	53	60	66	72	78	85	91	97			110	72	9	18
20		58	65	73	81	88	95	103	111	118			115	92	5	20
22		70	78	87	96	105	113	123	132	142			120	113	6	22
24		81	92	103	114	125	136	147	157	168			124	140	8	24
26				120	132	145	158	171	182	195	208		127	167	11	26
28				138	152	167	182	197	210	225	240		130	197	4	28
30				158	174	191	208	224	240	257	274		132	227	10	30
32				178	197	216	235	253	272	290	308		133	259	2	32
34				200	221	242	263	283	305	326	347		135	294	2	34
36				223	247	271	294	317	340	364	387		136	331	1	36
38					273	299	325	351	377	403	428	552	136	367	4	38
40					300	330	359	389	416	444	471	498	136	405		40
42					330	362	394	424	455	485	515	545	136	443	1	42
44							430	463	497	530	563	596				44
46							467	503	539	576	611	648				46
48							505	545	585	624	663	703				48
50							545	589	732	674	717	758				50
60							770	830	890	930	1,010	1,070				60
70							1,030	1,120	1,200	1,280	1,360	1,440				70
No.	1	2	2	8	11	16	14	22	11	1					88	

Block indicates extent of basic data. Data collected at Quesnel by Laboratory of Forest Pathology, Science Service, Dominion Department of Agriculture. Volume determined by sectioning logs to base of crown, top cubed as a paraboloid. Volume calculated for entire tree inside bark. Table prepared by alignment-chart method. Double bark thickness at D.B.H.=0.13 O.B. Standard deviation of individual trees ± 9.8 per cent. Aggregate deviation of table, 0.224 per cent high.

A study has been made of Girard's form-class principle in preparing log-length volume tables. The assumption is that trees having the same diameter at the top of the first log and having the same merchantable height will have similar, though not necessarily identical, rates of taper in the sawlog portion above the first log, regardless of species. The form-class is expressed as the relationship between the volume inside the bark at the top of the first 32-foot log and the diameter outside bark at breast height. The following equations based on British Columbia Rule and 32-foot logs have been calculated from Girard's base formula:—

Number of 32-foot Logs in Tree	Tree Volume in Board-feet, B.C. Rule, 32-foot Logs
1	$1.5232D^2 - 4.570D + 3$
2	$2.0716D^2 - 7.312D + 7$
2½	$2.6772D^2 - 9.414D + 9$
3	$3.1183D^2 - 11.101D + 10$
3½	$3.6888D^2 - 13.102D + 12$
4	$4.1607D^2 - 14.857D + 14$
4½	$4.7235D^2 - 16.832D + 16$
5	$5.2037D^2 - 18.609D + 17$
5½	$5.7496D^2 - 20.545D + 19$
6	$6.2462D^2 - 22.356D + 21$

D=D.I.B. top of first 32-foot log, merchantable top D.I.B.=60 per cent of diameter at top of first 32-foot log, which is approximately 40 per cent of the D.B.H., O.B. The above equation can be used for any species and form-class.

For example:—

Tree 50 inches D.B.H., 4½ log, form-class 70.

$$D=\frac{70}{100}\times 50''=35''$$

$$\text{Tree volume}=4.7235(35)^2-16.832(35)+16$$
$$=5{,}213 \text{ board-feet, B.C. Rule.}$$

The formula for the volume in cubic feet has been calculated for the merchantable portion of the tree above the first 32-foot log.

Volume cubic feet$=0.003732D^2$ L.

D=Diameter at top of first log.

L=Merchantable length in feet above first log.

Taking the example above:—

D=35″, 4½ logs=3½ logs above first log

=112′ volume above first log$=.003732(35)^2$

112=512 cubic feet.

The volume in the first log must be calculated separately to determine the merchantable volume of the tree. This will depend on the form-class and species.

A base cubic-foot log rule was made available for scaling. It is pleasing to note that the more progressive operators are leaning toward cubic feet in both their cruising and scaling. The mill production can be more readily estimated from cubic contents than British Columbia Log-scale. The following table shows the relationship between cubic feet and board-feet British Columbia Scale and mill tally.

AVERAGE FOR DOUGLAS FIR 16-FOOT LOGS

Top D.I.B.	Board-feet (B.C. Log-scale) per Cu. Ft.	Mill Tally per Cu. Ft.
9	4.3	7.1
12	5.4	6.8
15	6.2	6.9
18	6.5	7.0
21	6.7	7.1
24	7.0	7.4

Average mill tally, 7.1 board-feet per cubic foot.

(Table courtesy of Dominion Forest Products Laboratory, Vancouver.)

The above mill tallies represent a utilization for lumber of 60 per cent of the contents of the logs. In some mills up to 70 per cent is utilized for lumber and the remainder for other purposes such as pulp, etc. The board-feet (British Columbia Scale) per cubic foot ratio varies greatly with size of log, while the mill tally for an operation may be nearly constant. For this reason, lumber production can be more accurately estimated for a group of logs scaled in cubic feet than in board-feet. This also applies to pulp production. The cubic-foot scale is also fairest for logging contractors and logging superintendents particularly where small logs or long lengths are extracted.

YIELD

The following yield table is based on vegetative sites as described in previous Reports.

SITE-TYPE YIELD TABLE (WELL-STOCKED DOUGLAS FIR)
(Total volume per acre entire stand in cubic feet.)

Age	Site Type*					No. Plots
	P	PG	G	GPa	GU	
30	4,700	4,200	3,100	2,000	1,300	28
40	7,700	6,300	4,900	3,500	2,300	36
50	10,300	8,200	6,600	4,700	3,300	50
60	12,500	10,100	8,100	5,700	4,250	35
70	14,500	11,700	9,400	6,600	4,950	44
80	16,400	13,000	10,400	7,300	5,400	12
90	18,100	14,000	11,200	7,800	5,750	20
100	19,700	14,900	11,800	8,300	6,000	4
110	21,000	15,700	12,400	8,700	6,150	3
120	22,100	16,400	12,900	9,100	6,250	6
130	22,900	17,000	13,400	8,400	6,300	8
140	23,400	17,500	13,800	9,600	6,350	2
Number of plots	51	58	71	57	11	248
Average deviation, individual plots	13.4%	10.6%	16.0%	16.0%	8.8%	

Average deviation, 13.9 per cent; aggregate difference, 0.28 per cent.
* P=Polystichum; PG=Polystichum-Gaultheria; G=Gaultheria; GPa=Gaultheria-Parmelia; GU=Gaultheria-Usnia.

The table is based on 248 well-stocked plots, with Douglas fir forming 70 per cent or more of the stand. The plots were both permanent and temporary. The data from the periodic measurements of permanent plots gave the trends in volume increases. Beyond ninety years there are few plots, and the data must be used with discretion. No attempt was made to harmonize the volume curves for each site type. There was considerable overlapping of the volume data for the various sites. The average deviation of the plot volumes from the curved or table volumes was 13.9 per cent, which is not significantly different from tables where the site is based on the height of dominant and codominant trees and age. One method is no more accurate than the other, but where trees are tall the vegetative types may be more readily determined than age and height. The vegetation on cut-over areas has not to date been correlated with the vegetative types used in this table.

The volumes of stands correlated with average diameter was first used by this Service in preparing a yield table for Douglas fir shown in the 1924 Annual Report. The general principle is to eliminate the variable of height and number of trees by dividing the volume on each plot by these factors. The resulting quotient, plotted over average D.B.H. on double log-paper, gives a straight line. The data used in preparing the vegetative-type yield table gave the following equation:—

$$\frac{V}{N \times H} = \frac{D^{1.7153}}{227.2}$$

V=Total volume per acre in cubic feet.
N=Total number of trees.
H=Height of tree of average D.B.H.
D=Average D.B.H. of stand weighted by basal area.

The average deviation of individual plots from the curve expressed by the above formula was 3.7 per cent, which is approximately one-quarter that of the vegetative-site

table or site-index tables. It is felt that where periodic predictions are based on inventories, the prediction of the yield through average diameter is a superior method.

The base formula in its form $V = \frac{NHD^{1.715}}{227.2}$ is useful for cruising one-story second-growth Douglas fir. The number of trees can be counted. The average diameter can be closely approximated by counting the trees in two classes with the upper limit of the lower class the estimated mean diameter. This is adjusted to get the average diameter. The height of the tree of average D.B.H. is obtained by measuring trees about the average D.B.H. These factors applied to the base table will give the total cubic volume per acre. This value may be cut for any standard of utilization by using average D.B.H. per cent merchantable tables such as those given in the 1948 Annual Report.

The total number of trees per acre in each plot used in the Douglas fir yield table was plotted over average D.B.H. on double log-paper. The average deviation in number of trees for individual plots from the curved values was 14.5 per cent. Although this value is high, it is less than the variation when age and site are used. Therefore, where average diameter is used in short-cut methods of cruising, it would be better to count the number of trees than attempt to correlate the number with average D.B.H.

The height of tree of average D.B.H. and the average height of dominants and codominants were determined for each plot. The average difference for stands over 40 feet in height was 11.4 feet and the standard deviation of the difference was 4.1 feet. There was no significant decrease in difference with height. The height of tree of average diameter can be readily determined from a D.B.H.-total height curve, and using the above adjustment the average height of dominants and codominants can be closely approximated.

The field party of four men worked for three months making a survey of the residual stands and rate of growth on the sidehill types of the Okanagan Valley. The data are being worked up. A preliminary summary of the volume logged and residual stand on three areas are given below.

TABLE OF LOGGED AND RESIDUAL STANDS IN OKANAGAN VALLEY

Area	Site Index D.F.	Number of Plots	Logged					Residual Stand					
			Total Vol. (Cu. Ft.)	Av. D.B.H.	Species (%)			Number of Trees	Av. D.B.H.	Total Vol. (Cu. Ft.)	Species (%)		
					Py	F	Others				Py	F	Others
A	109	39	1,521	18.7	11	76	13	1,102	5.5	2,148	7	76	17
B	101	64	739	25.4	42	58	0	883	4.8	2,275	18	66	16
C	104	50	728	20.8	47	53	0	562	4.6	1,570	16	74	10

A reproduction survey of the three areas was made on 1/1000-acre units and these combined to form larger units.

PER CENT QUADRATS STOCKED

(Trees up to and including 3-inch D.B.H. class.)

Area	Number of 1/1000-acre Quadrats	Per Cent Stocked by Size of Unit in Acres				
		1/1000	1/500	1/333	1/250	1/125
A	784	18.9	28.3	36.7	39.3	59.2
B	1,024	26.7	37.3	46.1	48.0	69.5
C	624	25.6	36.8	48.6	49.3	70.5

A unit was considered to be stocked if there was one established seedling.

The above two tables give a picture of the stands. They are fairly well stocked, now having a volume from one and one-half to three times that removed in logging, but the

trees, as shown by the average diameters, are much smaller. The reproduction tends to establish in groups and the added fire-protection may tend to favour Douglas fir.

The rate of increase in diameter in the last twenty and forty years as indicated by ring-counts in the four Cardinal directions was tested on 180 trees in the mixed Douglas fir-yellow pine type of the Okanagan. The aspect was eastern and the slope 10 to 50 per cent. The average of the four counts on each tree is the most accurate and was used as a base in determining differences. The average difference, using the average of two borings at right angles, was more than twice as great as when two opposite borings were used and their standard deviation of differences was 50 per cent larger. In the current study of increment two borings were made on opposite sides of ten trees well distributed throughout the range in diameters on each of the 153 fifth-acre plots. Statistically this is sufficient to meet our standard of precision.

An analysis of the difference in gross merchantable cubic-foot volume of the Upper Fraser uneven-aged spruce-balsam type when computed by 2-, 4-, 6-, and 8-inch D.B.H. classes has been made. The diameter-class to be used for a certain maximum sampling error will depend on the number of samples making up the average. Assuming a maximum error of 1 per cent for sampling, a minimum of 13-, 26-, and 60-acre tallies for an average are required when 4-, 6-, and 8-inch classes are used respectively. The averages have to be corrected by the significant differences associated with the various classes. Under certain conditions large diameter-classes can be used without much loss in precision, the size depending on various factors, such as range in diameters in type, number of tallies in type, and allowable error for sampling justified by saving in field and compilation costs.

The errors in stock-taking may be divided into two major categories:—

(*a*) Sampling errors due to making a partial inventory.

(*b*) Non-sampling errors due to failure to obtain accurate information about each sampling unit, such as area of unit, diameter and heights of trees, etc.

The object is to obtain a specified degree of accuracy at a minimum cost. The principle is to obtain a sample just large enough to bring the sampling error down to a satisfactory level and to have sufficient controls to bring the non-sampling or human error to a minimum. Tallies on 71 acres in the uneven-aged spruce-balsam types of the Upper Fraser were analysed, and tables prepared to cover range in types commonly found in British Columbia. The percentage cruise for a given precision in this type depends on the area in each unit. For example, a 0.1-per-cent cruise on 30,000 acres will give the same precision as a 30-per-cent cruise on 80 acres. The use of statistics as a tool in planning inventories has been recognized in most softwood-producing countries of the world and finally will be adopted by all in reducing costs for a required precision of the estimate.

REFORESTATION

FOREST NURSERIES

Nursery production was reduced approximately 20 per cent by one of the worst winters on record. Frost-damage to both the 1–0 and 2–0 stock was severe at Duncan and Green Timbers. Although the annual precipitation for 1950 broke all records, rainfall during the crucial growing period for seedlings was very light, and supplementary watering was necessary.

Seed-beds were sown to produce 10,000,000 trees in the spring of 1952. Experimental work on soil-fertility was continued, and details are given by the Economics Division in this Report under " Nursery Fertility Studies."

At Green Timbers, due to the small size of the 2–0 planting stock, heavy culling was necessary, and only 2,384,000 trees were available for shipping to the projects. This condition may be caused by the severe winters of the past two years and the late spring growth or the gradual deterioration of the soil from continual cropping. With the reduced production at this nursery it is now possible to rest the land for two years between crops, and this condition will be remedied by the introduction of fertilizers. Plantations adjoining the nursery were brushed out and trails sprayed with 2–4–5T Esteron 64 to control undergrowth, with exceptionally good results.

At Campbell River 3,358,500 trees were shipped to planting projects in that area, and 3,600,000 trees will be available for planting in the spring of 1951. White-grub activity was negligible over the entire nursery-site, but it is not known if this is the result of using Benexane 5 or a normal cycle in the population of the grubs.

From Duncan Nursery 1,335,000 trees were shipped to planting projects in the Cowichan area. For the second year, root-pruning of 2–0 stock in August, to induce hardening-off before the fall frosts, was carried out with excellent results. A heavy infestation of strawberry root-weevil did considerable damage to the stock before the presence of the insect became apparent. However, this pest can be controlled by use of Ortho-bate before too much damage is done.

In the East Kootenay a few more seed-beds were sown near Elko to yellow pine and Douglas fir, and 50,000 seedlings were transplanted. Work was started on a new nursery-site on Perry Creek near Cranbrook, and seed-beds will be sown there in 1951.

SEED COLLECTIONS

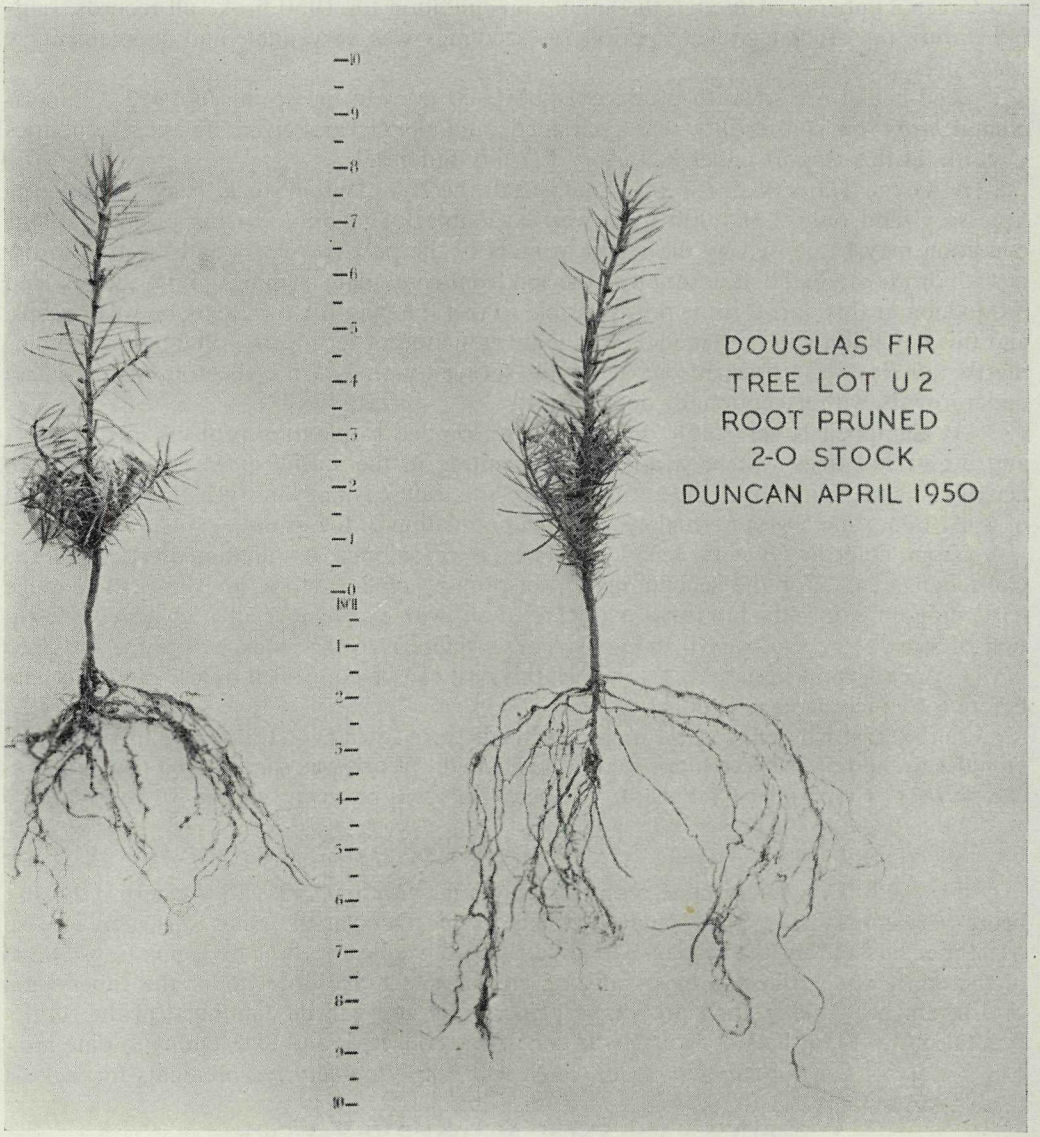
The 1950 Douglas-fir cone-crop was only fair, with hemlock and Western red cedar being very poor. The price paid to collectors for Douglas-fir cones was increased to $1.50 per bushel, but the response to advertising for collectors was disappointing. Most of the cones were collected by organizing crews of teen-age boys under the supervision of a foreman. This method proved very successful and will be continued in the future. A total of 4,600 bushels of Douglas-fir cones was collected, and extractions to date indicate a yield of 2,500 pounds of seed, which will supply nursery requirements for at least three years.

RECONNAISSANCE AND SURVEY WORK

Nine separate logged-and-burned areas, comprising 20,000 acres, were examined on the Coast. Only one area, of 7,500 acres, required planting, and a detailed map was prepared for the establishment of a planting project. In the East Kootenay region an additional 20,000 acres were explored, primarily to determine suitability for planting by machine.

PLANTING

For the third successive year because of snow, projects were not able to start until the latter part of March, and planting continued into the second week of May. Two fall


DOUGLAS FIR
TREE LOT U2
ROOT PRUNED
2-O STOCK
DUNCAN APRIL 1950

planting projects were carried on in areas not accessible in the early spring, but these were closed a month early, on November 15th, by an 18-inch fall of snow. During the year 6,720 acres of logged-and-burned land were reforested with 6,330,000 seedlings. One logging company planted an additional 680 acres with 550,000 trees. (*See* page 96 of Appendix for statistics of planting over the last ten years.)

Experimental planting with 1–1 yellow pine in the East Kootenay was carried on in the fall, when 16,000 trees were planted by machine and 12,000 with grub-hoes. Comparative survival between these two methods and also spring planting will be observed.

PREPARATION OF PLANTING AREAS

Crews were employed on seven different projects during the year. One new forty-five-man camp was erected (all sectional buildings) and another moved by barge to the west end of Great Central Lake.

Fifty miles of abandoned logging-grade was converted to truck-trails and 4 miles of new road were constructed. The maintenance of existing road systems is an ever-increasing problem, and in an attempt to keep up with this phase of the work, a new road-maintainer, complete with front-end loader, bulldozer blade, grader blade, and snow-plough, was purchased.

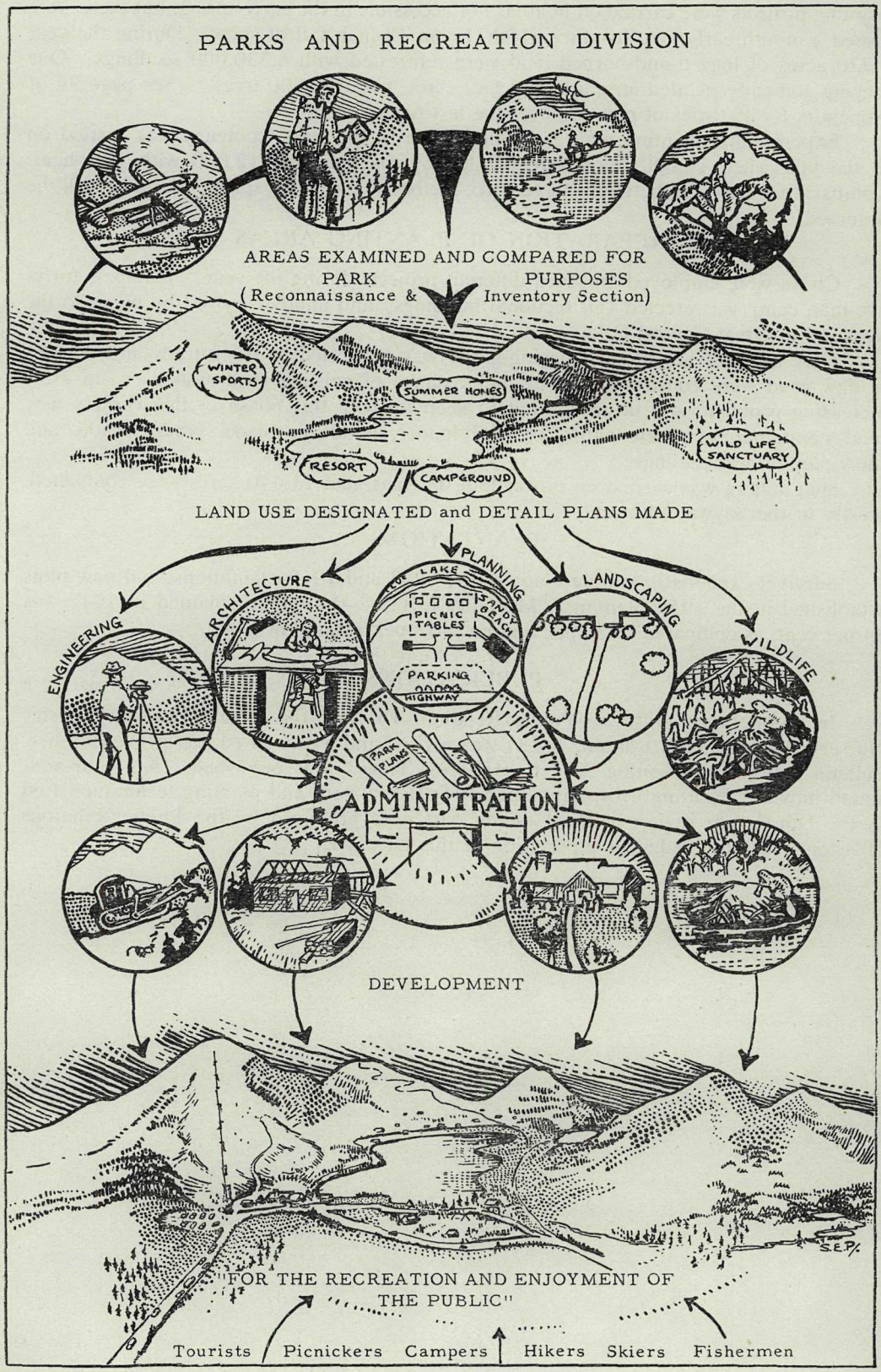
Snag-falling was carried on throughout the year, and 11,440 acres were completed, mostly in the Sayward Forest.

PLANTATIONS

Survival examinations were made in the 1947 and 1949 plantations, and new plots established in the 1950 planting. Mortality in the 3–0 seedlings planted in 1947 was 34 per cent, as compared to 20 per cent in 2–0 stock planted in 1949.

PUBLICATIONS

In co-operation with the Public Relations Division the Green Timbers Forestry Nursery Bulletin (First Edition, 1943) was revised and a second edition printed; a new bulletin entitled " Collecting Seed from Forest Trees " was published. A colour-and-sound movie, " Planting Prosperity," depicting the nursery and planting techniques used in the Douglas fir region of the Lower Coast, was produced by the Public Relations Division under the technical supervision of this Division.


PARKS AND RECREATION DIVISION
AREAS EXAMINED AND COMPARED FOR PARK PURPOSES
(Reconnaissance & Inventory Section)
WINTER SPORTS
SUMMER HOMES
RESORT
CAMPGROUND
WILD LIFE SANCTUARY
LAND USE DESIGNATED and DETAIL PLANS MADE
ENGINEERING
ARCHITECTURE
PLANNING
LAKE
PICNIC TABLES
SANDY BEACH
PARKING
HIGHWAY
LANDSCAPING
WILDLIFE
PARK PLANS
ADMINISTRATION
DEVELOPMENT
"FOR THE RECREATION AND ENJOYMENT OF THE PUBLIC"
Tourists
Picnickers
Campers
Hikers
Skiers
Fishermen
S.E.P.

PARKS AND RECREATION

Park-development in British Columbia has reached an important turning-point. For almost ten years the emphasis has been on reconnaissance, inventory, and planning, while several large undertakings, such as the Mount Seymour Road and Manning Park projects, have absorbed the bulk of moneys available for improvement work. Now, with the Mount Seymour Road completed and the main services and buildings installed at Manning Park, attention can be turned to phases which will directly welcome the visitor and give him an opportunity to stay and enjoy various park attractions.

ADMINISTRATION AND DEVELOPMENT

The increased staff required in the greatly expanded operations of this Division during the past several years has become stabilized to some extent. New personnel have now had sufficient experience to carry out their particular work with a minimum of supervision. A Recreational Officer assumed duties in the Kamloops District and thereby lessened appreciably the problems formerly handled in Victoria.

Since administrative headquarters and services were installed in several of the larger parks, it has been possible to have the supervisory personnel therein assume more responsibilities and establish their own individual administrative patterns.

The necessity for basic services in Mount Seymour and Manning Parks to meet the anticipated influx of visitors required, as in the past few years, the major share of development work and funds. The purchase of a compressor and a D-6 Caterpillar, complete with back-hoe, dragline, and bulldozer attachments, gave a great impetus to road and trail construction, but the intended building programme had to be drastically curtailed because of lack of funds.

Little Qualicum Falls Park.—Modern restrooms were constructed and placed in operation for the 1950 season. A stone-and-timber picnic shelter, equipped with tables and a unit of four brick-lined stone stoves, was opened to the public. Pit toilets and a water-outlet were provided at a temporary overnight camp area.

MacMillan Park.—A parking area was created at a registration point adjacent to the "Big Tree" in Cathedral Grove. Approximately 40 cords of firewood and 30,000 F.B.M. of sawlogs were salvaged from wind-thrown trees adjacent to the highway. Four hundred feet of 12-foot-wide gravelled roadway was constructed to a small picnic area at the mouth of Cameron River. Parking space for six cars was provided. Four picnic tables, two fireplaces, and pit toilets for men and women were installed.

Elk Falls Park.—A serious threat to valuable park property and also of concern to the British Columbia Power Commission were slides occurring in several places through lack of proper drainage. A co-operative attack on the problem was formulated, and a proportioning of costs established. The project was carried out in early winter and resulted in a deep ditch being dug to hard-pan around the periphery of the slide area. A large drain was placed in this ditch, and the seepage-waters collected and run down the bank in creosoted wooden piping.

Langford Workshop.—A planer has been installed and cupboards built for the storing of tools and equipment. The drying-shed was fitted with sliding doors and wired for lights. Of the eighty picnic tables made, sixty were shipped to various parks. The purchase of an acetylene welder made it possible to fabricate twenty steel fireplaces. Various pieces of furniture, signs, and carvings were turned out to fill special requirements.

Peace Arch Park.—The popularity of the park and the extensive use of the picnic facilities are shown by a registration of 13,503 persons at the summer house, 4,672 at the kitchen-dining building, and 5,972 attending club and association picnics. Over a million visitors entered Canada through the attractive landscaped grounds of the park.

Picnic shelter at Little Qualicum Falls Park.

Rest-rooms at Little Qualicum Falls Park.

Twelve picnic tables set on concrete slabs were placed adjacent to the kitchen-dining building and proved very popular. Additional drainage was provided at several critical points. A visual-type gasoline-pump and 500-gallon tank were installed, and the oil-house placed on a concrete slab, sided, and shaked.

The proposed picnic area on the old Indian reserve was carried forward by the clearing, burning, ploughing, grading, and seeding to grass of an area of approximately 3 acres. The water system was extended to provide future requirements.

Mount Seymour Park.—The contract let in May, 1949, for the remaining 4 miles of mountain road is nearing completion, with the road being officially opened by the Honourable E. T. Kenney on December 10th, 1950. Access by motor to the ski camp is now possible, and a bus turn-around has been constructed to accommodate three buses and a small number of cars. The service area at the base of the mountain was completed and a gasoline pump and tank installed.

Preparatory clearing and grading were carried out for a ski-tow, and later two temporary tows were rigged for operation. Buildings occupied by the concessionnaire and First Aid Ski Patrol were readied for winter use, and the headquarters building was furnished.

Manning Park.—As in the previous year, all of the building development was carried out under contract. However, the clearing, excavations, extension of light and water services, and the installation of sewage-disposal systems for four motel buildings and the service-station were completed by the Forest Service.

Extensive areas fronting on Pine Woods and the personnel building were brought to grade, layered with topsoil and seeded to grass. Filling and grading were carried out preparatory to the paving of the large adjacent parking-lot.

A ski hill, 800 feet long, behind the Ranger station was cleared and the slash completely burned. Two park-entrance signs were erected, and two fire-protection signs placed in the large burn.

The road and trail systems were greatly expanded with the help of three teen-age crews. The jeep-road to Three Brothers Mountain was extended 2½ miles, and an additional 1,800 feet of foot-trail constructed. The Windy Joe Lookout was made accessible by jeep by building the final 2 miles of jeep-trail. A trail, 1½ miles long, branching from this road leads to Frosty Mountain and was one of the projects undertaken by the trail crews. Trail crews made valuable improvements in the vicinity of Lightning Lakes. Four thousand feet of graded trail now allows pleasant travelling along Lightning, Flash, and Strike Lakes. The main climb to the Skyline Trail was relocated to jeep-trail standards, and right-of-way slashing accomplished for 2½ miles.

Wells Gray Park.—With the erection of a new bridge over the Murtle River in 1949, it was possible to make a crossing this year with road-building machinery and start work on the jeep-trail to Clearwater Lake. The first 5.3 miles of the 15.5-mile-long route was completed.

Maintenance.—The winter maintenance crew working in the parks on Vancouver Island completed their varied programme by the end of April. Park attendants were then placed in each park, with the exception of Goldstream Park, and the usual intensive maintenance and supervision was continued throughout the tourist season. Two new parks, Ivy Green Park and Goldstream Park, were readied for visitor use by a thorough cleaning and the installation of signs, picnic tables, and fireplaces. The importance of these services and the intensive maintenance required on the small park areas may be better appreciated from the following table:—

Name of Park	Number of Registered Visitors	Number of Campers
Little Qualicum Falls	16,066	279
Elk Falls	10,315	894
Englishman River Falls	9,558	213
Stamp Falls	5,681	195
John Dean	4,700	504
Totals	46,320	2,085

The above figures represent only 40 per cent of the total number of persons who actually visited the parks, since a large proportion do not register. A small crew was employed on clean-up and repair work during the 1950–51 fall and winter season.

Problems in Peace Arch Park were aggravated by the severe winter of 1949–50 which killed a number of trees and shrubs. Added to the usual maintenance of lawns and beds of flowering annuals was the care of the recently installed picnic facilities.

In Mount Seymour the completed section of road required continual repair and improvement. Buildings to house the various concessions were altered, and such facilities as light, water, and fuel were modernized for more efficient service.

The road to Dawson Falls in Wells Gray Park was further ditched and surfaced, and the new bridge over the Murtle River was sprayed with wood preservative and all metal parts given a coat of red lead. As forest-protection projects, four trails were cleared and made passable for horse traffic.

RECONNAISSANCE AND INVENTORY

The reconnaissance and recording of the recreational assets of this Province are proving to be a tremendous task which will take many years to complete. The staff specializing in this work now consists of three men, assisted by the ever-increasing co-operation of district staffs and other Recreational Foresters in the field. Organization and classification of the data gathered to date have been the main objective of this past year, along with an attempt at standardization of reconnaissance methods and descriptive definitions. The latter phase of this work is complicated by the fact that parks and recreational values are often intangible in nature, hence difficult to define clearly.

The loss of one assistant and the addition of two new men required that some time be spent in initiating the new members in the present organization of the section and familiarizing them with the problems. To this end, both men were on field work for from one to three months. During the same period a third man was on loan to the Forest Economics Division for road-survey purposes. The main projects undertaken this year were:—

(1) A survey and reservation of potential camp-sites on the Fraser Canyon Highway.
(2) A study of problems in Hamber Park and a review of its recreational assets.
(3) A preliminary regional study of the recreational requirements of Prince George, Prince Rupert, and Peace River areas.
(4) A reconnaissance of the Bowron Lakes area and its problems in relation to its eventual park status.
(5) A survey of forest recreation problems at Pendleton Bay and Topley Landing in the Babine Forest.

Wherever possible, contact was made with the district staff, and forest-recreation problems were discussed and clarified. The Strathcona Park-Forbidden Plateau report was finally completed, along with the second part of the Bowron Lakes report.

The inventory of timber values in Strathcona Park is in process of compilation by the Surveys Section of the Forest Economics Division, which also gave valuable assistance

in cruising and preparing estimates of timber volumes within two areas under investigation as potential parks—namely, the Mount Brenton area, and an entrance and winter sports unit of the Forbidden Plateau.

Summary of Parks
(As of December 31st, 1950)

Class of Park	Number	Acreage
A	24	296,318.680
B	5	7,054,891.000
C	29	4,044.445
Special	3	1,656,455.000
Totals	61	9,011,709.125

New Parks

Parks formed during 1950 are as follows:—

Name	Created	Acreage	Class	Vicinity	Forest District
Cameron Lake	Nov. 7, 1950	733	"A"	Cameron Lake, V.I.	Vancouver.
Miracle Beach	Oct. 16, 1950	142	"A"	Oyster River, V.I.	Vancouver.

Increases in Acreage

Manning Park increased from 171,500 acres to 176,080 acres.
Wells Gray Park increased from 1,164,960 acres to 1,165,005 acres.

PLANNING

While it must always be recognized that the objective of park administration is development enabling greater public enjoyment of recreation areas, increasing emphasis is being placed on the planning which must guide such development. Parks are becoming recognized as the outdoor homes of people, and planners are striving to integrate the various uses and areas involved with much the same nicety that the architect seeks in designing a home or any other building. Considerable progress has been achieved toward this end during the past year. The policy is being continued of carrying out the greater part of park-development in those areas most readily accessible on the Lower Mainland, Vancouver Island, and to camp-sites and roadside areas adjacent to prominent highways.

Little Qualicum Falls Park.—The development plan at Little Qualicum Falls Park was revised to provide improved accommodation for maintenance personnel and to segregate overnight campers from intensively used picnic areas.

Goldstream Park.—Following the acquisition of Goldstream Park, preliminary investigations were carried out, and data regarding access, topography, cover, and use have been added to the registered plan of the area.

Miracle Beach Park.—A basic development plan providing for intensive day and overnight use of this newly acquired seaside park was produced. Ultimate facilities anticipated for the area include access and internal roads, parking areas, picnic sites and shelters, change-houses and toilets, camp-sites, and park attendant's quarters and service-yard. The plan envisions early installation of a gravity water system, the haulage of driftwood from the beach, and the construction of some type of permeable groins to protect and build up the sand beach.

MacMillan Park.—A basic development plan was prepared to allow for the public enjoyment of this area and to preserve and protect it from improper use. Requisite signs, guard-rails, pathways, and structures were designed and, in part located on the ground.

Cameron Lake Park.—Three small usable areas on the shore of Cameron Lake were mapped, and tentative plans for their development as picnic-sites were formulated.

Sayward Forest.—Following an extensive study, a recreation plan was evolved for the Sayward Forest, and recommendations were prepared to facilitate the administration of recreation potentials.

Peace Arch Park.—Outdoor picnic facilities were laid out in furtherance of the existing over-all development plan.

Mount Seymour Park.—A landscape plan for the lower Administration Building was prepared, and the task of gathering data to correlate uses and facilities at the upper end of the road was continued. A topographic map (2-foot contours) of the upper area was prepared; data on potential chair-lift locations, rope-tows and parking facilities, lodges, cafeterias, dormitories, and other installations were gathered; and a plan for the ultimate development of the park is nearing completion.

Manning Park.—Motel units were sited and early units of the trail system located. Landscape plans were prepared for Pine Woods Lodge and the service-station. Preliminary surveys and plans were completed for four picnic-and-campsite areas adjacent to the Hope–Princeton Highway.

Cultus Lake.—Preliminary mapping was completed. Tentative proposals have been prepared and a tract chosen as the site of a Department of Agriculture (Dominion) Insectary. Final plans for this park must await decisions on the relocation of the Columbia Valley Road.

Wells Gray Park.—While a firm plan for the development of this great area has not yet been evolved, a large amount of work toward that end was accomplished during the past year. The possibilities of co-ordinating the requirements of both forest protection and recreation use in an integrated system of jeep-trails and horse-trails were explored, and preliminary locations between Dawson Falls, Clearwater Lake, Mahood Lake, and Murtle Lake were investigated. Camp-sites and picnic areas were located in the vicinity of Dawson Falls, and potential Ranger station and lodge sites were chosen and mapped. The first phases in the evolution of a wild-life management plan were completed.

Ranger Station Landscape Plans.—To assist other divisions of the Service, the Planning Section has provided, as time and opportunity permit, landscape plans for newly constructed Ranger stations. Such plans were prepared for two stations during the past year.

Other Parks.—The Board of Park Commissioners, Nanaimo, sought assistance in planning the development of Bowen Park. Necessary field work has been completed, and a comprehensive long-term plan is being prepared as other demands upon the services of Division personnel permit.

ENGINEERING AND ARCHITECTURAL DESIGN

In execution of the development plans for the various parks throughout the Province, the Engineering Section has been concerned with the following: (1) Designs, (2) surveys, (3) consultation and (or) supervision on Forest Service projects, and (4) supervision of contracts.

Miracle Beach.—Preliminary engineering reconnaissance only has been carried out in this newly acquired park area.

Forbidden Plateau.—A three-man crew spent two weeks in this area making a reconnaissance of the Anderson Lake region where the park entrance might be located and running a traverse of 2 miles to serve as a base-line for cruising purposes and as a road location.

Elk Falls Park.—Surveys were carried out and a drainage plan formulated to alleviate seepage from the John Hart Dam causing the bank to slide above the swimming-pool area. Further work has been done in the vicinity of Elk Falls to provide a master

drainage plan. This involved the design of culverts, catch-basins, and means of safe disposal of waste into the river.

Mount Seymour Park.—A topographical survey was completed in the area between the Administration Building and the Concession Building to allow for study of parking facilities and the location of the lodge. A transit traverse, 3 miles long, was completed through the cabin area to Goldie Lake and then on to the Administration Building. The survey also included the erection of two concrete monuments with calculated azimuth.

The contractor started work at Station 330+00 toward the end of June, but progressed rather slowly at first due to snow at the upper levels. The following work was completed:—

(1) Clearing, 13.055 acres.
(2) Grubbing, 9.201 acres.
(3) Grade excavation:—
  (*a*) Rock, 9,922 cubic yards.
  (*b*) O.M., 29,759 cubic yards.
(4) Foundation excavation:—
  (*a*) Rock, 56 cubic yards.
  (*b*) O.M., 331 cubic yards.
(5) Culverts, 734 lineal feet.
(6) Select subgrade material, 5,863 cubic yards.
(7) Finish material, 203 cubic yards.
(8) Haul (combined), 6,065 cubic yards.
(9) Over-haul, 5,097 cubic yards.

At Mile 4 a drainage system was constructed to divert a portion of the road drainage into a ditch formed by the old West Side Trail. Two 36-inch culverts were installed, one 128 feet long.

At Mile 4.4 a 500-foot-long section of road, badly damaged in the storm of November, 1949, was reconstructed, entailing the removal of some 700 cubic yards of rock and the placing of 300 cubic yards of road gravel. From this point to Mile 5.5 all ditches were redug and considerable gravel placed on the road.

Manning Park.—Additional construction in the concession area this year necessitated the supervision of two contracts and the extension of services.

Surveys were limited to location of buildings, line and grade for water, and electrical transmission-services extensions, layout and grade of driveways, parking areas, lawns, and sprinkler system.

During the year several development projects were undertaken by Forest Service crews under supervision of the Park Ranger, and for these projects the Resident Engineer requisitioned materials and provided consultation as required. These works included:—

(1) Installation of four 2,000-gallon underground gasoline storage-tanks, the construction of a pump island, and the mounting of the gasoline pumps for the service-station.
(2) One thousand six hundred feet of extensions to the water and electrical transmission systems to supply the service-station and four motel buildings erected during the year.
(3) Grading driveways, parking areas, lawns, and other areas.
(4) Construction of an additional grease-trap and two disposal-beds at Pine Woods.
(5) Installation of an underground-sprinkler outlet system in the area around Pine Woods.
(6) Clearing and grading of jeep-trails to Windy Joe Mountain and those started to the Three Brothers Mountain area and Skyline Trail summit.

The 1949 contracts for the construction of the Forest Service Personnel Building and Pine Woods were brought to completion by June 1st, and the latter officially opened for business under a concessionaire.

The 1950 contract for four motel buildings, each containing three rental units, and the sales wing of a service-station was supervised during the latter half of the year and, by the year's end, work was almost completed. The electrical installation for these structures was under a separate contract, but progressed along with the construction and is also near completion.

Wells Gray Park.—Engineering work centred on the location and partial construction of a jeep-trail from Dawson Falls to Clearwater Lake.

A party consisting of one graduate civil engineer and two engineering students spent three months in the park on reconnaissance and location of 15.5 miles of jeep-trail from the Murtle River Bridge to Clearwater Lake. Location is such that a maximum grade of 7½ per cent, and a minimum radius of turn of 90 feet can be provided. A chain-and-compass traverse was run over the existing 4 miles of park road, and levels taken over the route. Detailed topographic maps of the Dawson Falls area and a proposed Ranger station-site were prepared to a scale of 50 feet to the inch and contour interval of 5 feet.

Under supervision of the Park Ranger, advised by the Resident Engineer, the approaches to the Murtle River Bridge and 5.3 miles of the Clearwater Lake jeep-trail were constructed during the year. Present grade of the bridge approach is 17 per cent, which is satisfactory for present use, but location is such that grade can be reduced to 10 per cent.

Cultus Lake.—An engineer and an assistant prepared topographic maps of five areas on the easterly and southerly shores of the lake. These will be used in the planning phase of the park development.

Silver Star Park.—A party of three spent three weeks in October on the Silver Star Park Road project. A preliminary line was run and a rough estimate of construction costs was prepared. A road, built to winter standards, 5.2 miles long, will be required to give access to the ski-ing area, and a total of 8½ miles at a grade of 8 per cent is needed to reach the top.

Liard River Hot Springs.—A reconnaissance was carried out by one engineer with the assistance of the nearest Forest Ranger to locate the best access route to these hot springs, which are less than one-half mile from the Alaska Highway. They are difficult to reach due to a stretch of sulphurous bog created by the overflow of the springs. A chain-and-compass line over the most promising route reached the large pool in 1¼ miles, and the smaller and hotter pool one-quarter mile farther. Levels and cross-sections were taken with an Abney level to facilitate a rough estimate of cost of construction. Topography in the vicinity of the pools was plotted for development planning.

FOREST MANAGEMENT

The estimated value of all forest products for the year 1950 reached a total of $468,371,000. This value far exceeds all previous records and reflects the combination of high volume of production and inflationary values. Practically all forest products shared in this increase, but particularly lumber, pulp and paper, shingles, and plywood.

The total cut for the Province amounted to approximately 4,560,000,000 board-feet log-scale, being an increase of 510,000,000 feet over 1949 and the greatest annual cut in our history.

Water-borne lumber shipments exceeded those of 1949 by 320,000,000 feet. Greatly increased shipments to the United States and the Atlantic Coast account entirely for the increase. At the same time, shipments to the United Kingdom are down from 1949 by approximately 100,000,000 feet. Shipments to other markets remained fairly constant.

The statistical tables in the Appendix of this Report supply details of forest-management activities, and the following comments comprise the highlights of the data enumerated in the detailed tables.

Of the total cut of 4,560,000,000 feet—all products in board-feet—Douglas fir readily maintains its leading position in volume cut—namely, approximately 1,834,000,000 board-feet, or 40 per cent of the total. This is in excess of the combined total of the next two species in order of volume cut—namely, hemlock and cedar. The cut of these species amounts to approximately 920,000,000 board-feet or 20 per cent and 801,000,000 board-feet or 18 per cent respectively. Spruce and balsam, the next species in importance, amount to approximately 487,000,000 board-feet or 11 per cent and 239,000,000 board-feet or 5 per cent respectively. Other species in order of importance are as follows: Larch, lodgepole pine, yellow pine, and white pine, amounting in all to 256,000,000 board-feet or 5 per cent. The balance of 1 per cent is made up of deciduous species.

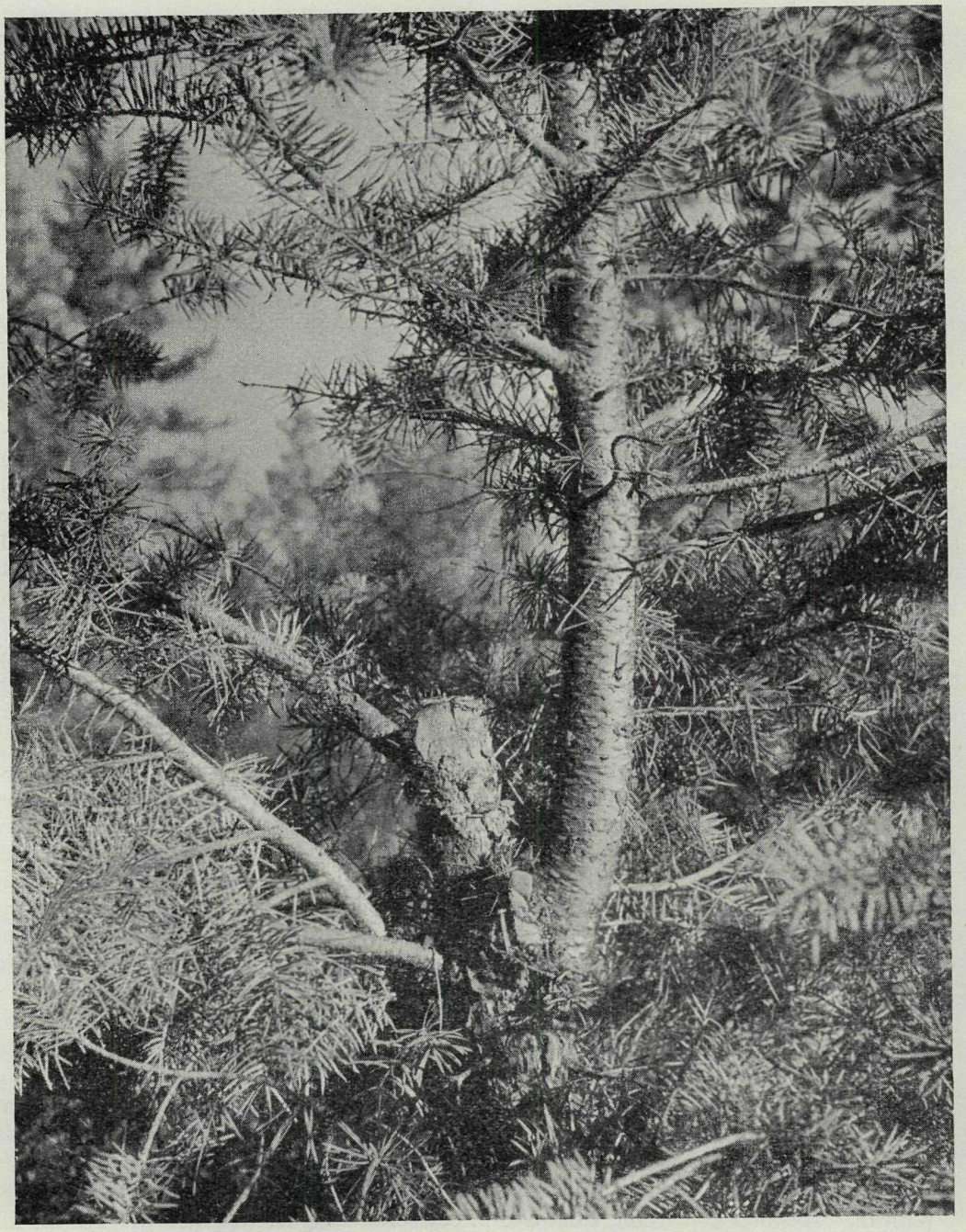
All forest districts participated in the increased cut of 510,000,000 board-feet, of which 350,000,000 originated in the Vancouver Forest District or the equivalent of an increase of 12 per cent for that forest district over 1949. The Fort George Forest District had the largest percentage gain—namely, 22 per cent or 52,000,000 feet.

On the basis of origin of cut, timber sales continue to lead all other categories, with approximately 1,600,000,000 feet; next follow old Crown grants, with about 1,100,000,000 feet; timber licences are in third place, with 800,000,000 feet. All these categories show a gain over 1949. Volume production in cubic feet shows a continuing increase, reflecting the growing tendency toward closer utilization of lower-grade logs through relogging of salvage values principally for the manufacture of pulp. For the first time in our history a scale from management licences shows up. In the future the cut from management licences will assume ever-increasing importance with each successive year.

Timber sales awarded amount to 2,591, including cash sales, being slightly higher than 1949; however, the estimated value increased by approximately $3,500,000 to $9,153,000, reflecting the higher stumpage values which have taken place generally throughout the Province, particularly for sawlog species. Total existing sales remain at approximately the same level—namely, 6,200. The total area under sale contract is 1,500,000 acres, with guarantee deposits amounting to $2,800,000.

Stumpage prices bid show a wide variation for all species due to competitive bidding. With the exception of balsam, stumpage prices show a higher weighted average for all species. The weighted average for all species is $5.19 per thousand, inclusive of royalty, an increase of $1.14 or 28 per cent over 1949.

As 1950 closed, the demand for Crown timber reached its highest level of the year; in particular, numerous applications are on hand for large individual volumes.



Cropped eight years ago, this stem has since produced a " limb " tree which is ready for cutting.

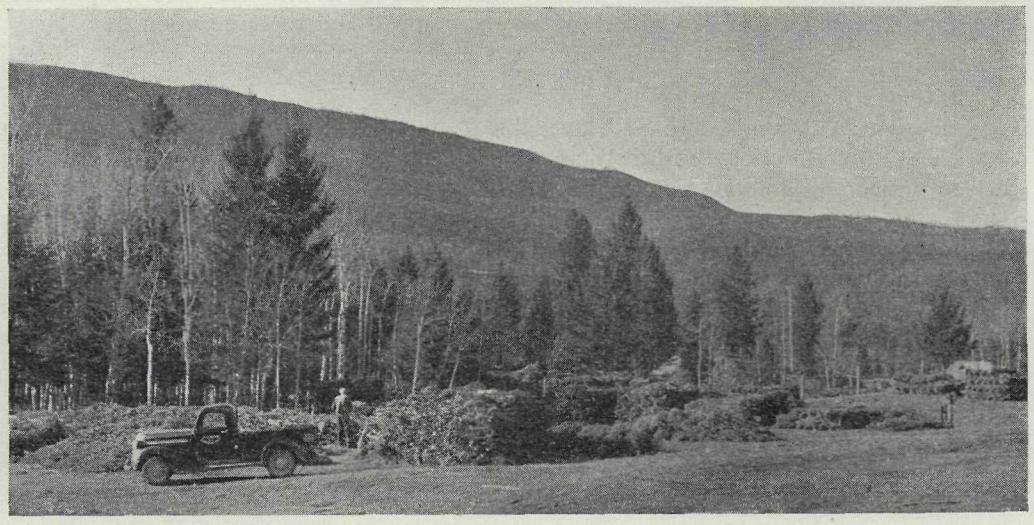
The number of operating sawmills throughout the Province reached an all-time high of 1,891, including 65 shingle-mills; conversely the number of shut-downs in both saw and shingle mills was down. The fact that the number of operating sawmills in 1950 is double those in existence in 1945 clearly indicates the expansive development of the lumber industry in recent years in all parts of the Province. In so doing it must also indicate the rapidity of forest-capital depletion now taking place and, as a consequence, the increased urgency for immediate application of sound silvicultural practices and regulation.

Total log exports continued their downward trend, amounting to 138,000,000 feet in comparison with 146,000,000 and 164,000,000 feet for the years 1949 and 1948 respectively. Of the 138,000,000 feet exported, 125,000,000 feet or 81 per cent originated on Crown grants with export privileges. The value of minor products marketed outside the Province of $5,800,000 shows an advance of $300,000 or 6 per cent, the bulk going to the United States. Poles and piling constituted 68 per cent of the total value.

Other activities included in the Forest Management Division which show increased activity over 1949 are as follows: Timber sales cruised numbered 2,196, or an increase of 34 per cent; number of logging inspections was 16,221, or an increase of 5 per cent. The frequency of inspections, however, is far below that considered necessary to maintain adequate supervision. This is due to the inability of an inadequate field staff to cope with the increased activity generally in logging and milling operations.

Reversing the trend during 1949, the number of trespass cases reported shows a sharp decline. The acreage cut over and volume showed a corresponding decline.

In consequence of the increase in total production, it may be noted that timber marks issued and draughting-office work showed a very marked increase, and greatly in excess of normal activities in these directions.



Thousands of Christmas trees pass through this sorting-yard in the East Kootenay.

SUSTAINED-YIELD MANAGEMENT

Study of the situation with respect to sustained-yield forestry on specific areas by private industry and the Forest Service has led to completion of six more contracts for forest management licences during the year. The total number now in effect is eight. Working-plans are at hand for two more prospective licences, for which contracts should

be executed shortly. In five other cases where the application has been approved and a reserve established, working-plans are in various stages of preparation.

Analysis was completed of four public working-circles consisting of Provincial forests or parts of them, and regulation of cut will be initiated during the coming year. Field work leading to complete working-plans for these and other areas is proceeding. In the field of extension forestry, activity was confined to farm-woodlot licences under section 19 of the "Forest Act," for three of which working-plans have been prepared. Field work in connection with other applications has been carried out. A bulletin dealing with these licences was prepared and published during the year. While the number of farm-woodlot licences will be limited by the relatively small areas of suitable Crown land in or near farming communities, they will provide working examples of what can be accomplished in farm forestry and be a nucleus for extension forestry among farmers in general.

FOREST-COVER MAPS

In the course of the year 1,308 maps were revised, as follows: Victoria, 397; district offices, 430; Rangers' offices, 481. Of the above total, 113 are new replacements. New replacements included 25 new forest-survey editions and the 75 maps comprising these were distributed to the three offices concerned. Thirty-eight were maps replaced for wear and tear.

Instruction in forest-cover mapping and the organization of maps and plans was given to ninety-seven Forest Service personnel and nineteen Land Inspectors and Land Utilization personnel of the Lands Service at thirty-one points throughout the Province, as follows: Ranger School, Green Timbers, 21; Vancouver Forest District, 30; Fort George Forest District, 6; Kamloops Forest District, 8; Nelson Forest District, 32; Victoria, 19.

An extensive reconnaissance of the Beaverfoot River and Kootenay River watersheds within the Nelson Forest District was made to check the cover-map record. An approximate area of 214 square miles was mapped and reported upon.

SILVICULTURAL FUND

During 1950, funds were made available from the Silvicultural Fund for silvicultural work in all four Interior forest districts. Nelson Forest District employed two crews on eleven projects, Kamloops Forest District employed two crews on sixteen projects, Fort George employed two crews on ten projects, and Prince Rupert employed one crew on five projects. Work performed consisted of snag-falling, piling and burning logging slash adjacent to public highways, reduction of slash-hazard along logging-roads by piling and burning, piling and burning abandoned mill-waste debris, reduction of slash-hazard by lopping and piling and burning accumulations of logging slash on timber-sale areas, construction of fire-guards by utilization of old logging-roads where practicable, and (or) natural fire-breaks.

FOREST ACCOUNTS

In spite of the adverse weather conditions, which hampered operations and resulted in reduced collections for the first three months of 1950, another new record was set for revenue collections, the total of $9,229,987.15 being an increase over the previous record year of 1949 of $1,048,126.18.

Charges against logging operations for the calendar year also increased, by $1,507,556.52, to a new record high of $10,163,125.26.

The year 1950 saw the first cutting permits issued under management licences, the record of which is shown on page 101.

Due to the continuing increase in the volume of accounting and recording work, it has been necessary to modernize some of the accounting procedures. All timber-sale, timber-licence, and timber-lease records are now kept on a ready-reference card system, and the Scale and Royalty Accounts Receivable ledgers are now being posted by a mechanical posting-machine.

FOREST PROTECTION

WEATHER

At the start the 1950 fire season was most encouraging from the fire-fighting standpoint. A late, cold spring, common throughout the Province, precluded the usual flash-hazard. Both snow and sharp frost were experienced at several points throughout the Interior on May 22nd. By the end of May the green growth had obliterated the danger of flash fires. Thereafter, several periods of hazard build-up occurred which were relieved generally by heavier rains than usual. September would have proved a disastrous month in the Interior if the usual lightning-storms had developed but, fortunately, these were comparatively few. A comparison with fires for the past ten years in Table No. 48 (*see* Appendix) shows that the 1,515 fires reported were only slightly over the average for the past ten years.

In the Vancouver Forest District, in spite of the general feeling that last summer was the driest in many years, precipitation for the area was above the ten-year average during the fire season. The periodic hazard build-ups of July and August were relieved by heavier rains than usual. The hazard risk continued into late September and thereby retarded intentional slash-burning to some extent.

In the Prince Rupert Forest District the fire season was comparatively light, with only fifty-three fires reported, the most hazardous period being the first week of July, when the Perow fire, disastrous to several small mills, occurred.

In the Fort George Forest District, west of the Rockies, no great hazard build-up was experienced until June 8th. During that month the precipitation was only one-quarter of the average, but this condition was relieved by July 8th. September was also an unusually dry month in the Fort George District. East of the Rockies the fire season was severe. Although May was an easier month than usual, June was more active, particularly in the northern part of the area where several large fires occurred—mostly in the perma-frost areas where the scrub timber did not warrant major fire-fighting expenditures. General rains and cooler weather than usual alleviated the situation until September 9th. Subsequently, high winds, low humidities, and the total absence of rain soon raised the fire-hazard to a high level. New fires sprang up, old dormant fires revived, and settlers' burning-fires got out of control, particularly between September 19th to 25th, when numerous acreages were burned. These fires burning in the outlying areas, mostly in scrub-timber types, plus similar fires in Alberta, caused a widespread smoke haze which received considerable publicity.

In the Kamloops Forest District, due to the late spring, the usual early fires of the cattle country were missing. June and July were generally hot and dry, with conditions becoming acute in the latter half of that month. A break in the weather thereafter eased the situation temporarily, but hazard conditions built up again during August and continued to September 23rd. With 531 of the total fires for the Province, the Kamloops District had the worst fire season of our five forest districts west of the Rocky Mountains.

During the fire season, weather in the Nelson Forest District was similar to that of Kamloops, except during the month of September, when the rainfall was double that of Kamloops. Both districts benefited greatly by the moderate lightning activity as compared with former years, which accounts for the 10-per-cent decrease in the number of fires from this cause compared to the past ten years, as shown in Table No. 48 (*see* Appendix).

FIRES

Occurrences and Causes

The 1,515 fires of the 1950 season, although less than the number for last year, were still slightly above the ten-year average (*see* Table No. 48 of the Appendix). For

monthly fire occurrence by districts *see* Table No. 46. Shown below are comparative figures of fire occurrence, by forest districts for the ten-year period 1941–50:—

Forest District	Fire Occurrence during Ten-year Period 1941–50	Percentage of All B.C.
Vancouver	3,980	27.04
Prince Rupert	581	3.95
Fort George	1,473	10.01
Kamloops	4,400	29.89
Nelson	4,285	29.11
Totals	14,719	100.00

Sixty-three per cent of the total fires occurred during July and August, which are always the worst two fire months, and the higher percentage of these two months—namely, 11 per cent—is a reflection of the relatively reduced lightning-fires in September.

The three major causes of fire occurrence were campers and smokers, 35.8 per cent; lightning, 22.6 per cent; and railways, 13 per cent. For reference *see* Table No. 52 of the Appendix. Camper and smoker fires are up 6 per cent over the ten-year average and lightning is down 11 per cent. Railway fires are down 6 per cent below last year and 1 per cent below the ten-year average. In the Vancouver Forest District, last year's figure of 55 per cent, due to railways operating, dropped to 24 per cent this year. These decreases in railway fires can be largely attributed to the more general use of diesel-powered locomotives.

Cost of Fire-fighting

For details under this heading *see* Tables Nos. 41 and 57 of the Appendix. The latter table covers only wages, food, and transportation of fire crews and does not include Forest Service protection overhead as detailed for the previous year in Table No. 40.

Again it will be noted in comparing Tables Nos. 41 and 57 that outside agencies in the Vancouver Forest District spent more money on direct fire-fighting than the Forest Service over the whole Province. On two of these industry fires, $13,343 is reported to have been spent, which was approximately the total expended by the Forest Service in fighting fire in the Vancouver Forest District last year. These high costs to industry are due largely to the payment of prevailing wages to fire-fighters. If statutory fire-fighting rates of pay were raised to the same level, it is estimated that the 1950 fire-fighting cost to the Forest Service would have been over $300,000 instead of $141,688.

The two major causes of Forest Service fire-fighting costs are campers and smokers, 43 per cent, and lightning, 33 per cent. The former is up 15 per cent over last year, and it is a sad commentary that carelessness on their part caused a needless fire-fighting expenditure of $63,780.

The total cost to the Forest Service of direct fire-fighting in 1950—namely, $141,688—is up almost 50 per cent over last year and 18.8 per cent above the average for the past ten years.

Damage

The total area burned in 1950 is estimated at 848,246 acres or more than two and one-half times the average for the past ten years. Table No. 54 (*see* Appendix) shows that the Fort George Forest District accounted for over 95 per cent of the area burned. In that district over 80 per cent, or 795,500 acres, of the burned acreage was east of the Rockies in the Peace River country and north of the 60th parallel. There three fires averaged over 200,000 acres in size and fifteen fires aggregated 780,400 acres, or over 92 per cent of all the acreage burned in the Province during 1950. Table No. 54 also shows that, although the acreage burned was so large, the damage is estimated at less than

the ten-year average. This is due to the majority of the damage occurring east of the Rockies in the northern part of the Province. Of the 780,400 acres mentioned, only 1,520 acres were classed as mature timber and 43,800 acres as immature timber, mostly on low-quality sites. The balance, or 725,000 acres, was classed as non-commercial cover, grazing land, or non-productive.

As a result of these Peace River fires, it will be noted from Table No. 54 that 78 per cent of the fire damage for the Province is attributed to the Fort George Forest District.

From Table No. 53 (*see* Appendix), damage to property other than forests is reported as $413,200, of which 80.7 per cent occurred in the Vancouver Forest District. Most of this damage to equipment and felled-and-bucked timber in the Vancouver Forest District was caused by the desire of some operators to maintain log production at the risk of fire occurrence in the more hazardous weather, and again some extremely costly payments were made for errors in judgment.

FIRE-CONTROL PLANNING AND RESEARCH

Visibility Mapping

Three two-man crews were in the field this year under the over-all supervision of a Technical Forest Assistant. As in previous years, the personnel was recruited from forestry students at the University of British Columbia, and work was carried out in the Vancouver, Fort George, Prince Rupert, and Nelson Forest Districts. One hundred and twenty-seven possible lookout-sites were examined in detail, and visibility maps and reports completed for each. Of these, eleven primary lookouts and nine secondary lookouts were finally recommended as follows: Vancouver Forest District, six primary (five manned in 1950) and one secondary; Fort George Forest District, one primary and three secondary; Prince Rupert Forest District, two primary and three secondary; Nelson Forest District, two primary and two secondary.

The information obtained by the crews has been compiled and bound in book form, and a copy of each report has been forwarded to the district concerned.

Panoramic Lookout Photography

During the past summer the experienced two-man lookout photography crew accomplished an excellent season's work. With efforts confined to the three southern forest districts, the crew was able to take full advantage of periods of locally good photographing weather, as the distances to be moved from point to point were comparatively short. In all twenty-three lookouts were completed.

Lookouts photographed for the first time were located in forest districts as follows: Vancouver, one; Nelson, one; and Kamloops, three. Lookouts with outdated pictures were rephotographed as follows: Vancouver, six; Nelson, ten; and Kamloops, two. A total of 159 sets of photographs was completed. This figure includes multiple sets for the lookouts done this year and reprints from old negatives for the Forest Service and industry as they were required. Since 1936, 135 lookouts have been photographed and, of these, 34 have been retakes.

Trail and Road Traverses

Four traverse crews, as described in last year's Annual Report, were again fielded. In all, some 310 miles of existing roads and trails were traversed, marked on the ground at 20-chain intervals, and plotted on maps by these crews in forest districts as follows: Prince Rupert, 76 miles; Fort George, 100 miles; Kamloops, 76 miles; and Nelson, 58 miles.

Fire-weather Record and Investigations

As the study of fire weather and factors influencing fire-risk is a very complex one, it was thought best to concentrate on one district—namely, the Vancouver Forest District—for the present.

With this in view, the number of stations observing and recording fire-hazard factors was increased to forty-six in that district. Of these, twenty-six stations radioed their findings twice daily to the Vancouver and Victoria headquarters.

These statistics were used not only for correlation with weather forecasts in determining hazard build-up, as already described in the 1946 Forest Service Annual Report, but were used by the Forest Service meteorologist for comparison of existing fire-danger rating systems.

Results indicate that the extensive use of fuel-moisture sticks as one of the principal and simplest devices for determining hazard build-up is fully justified. During 1950, 217 sets of hazard-sticks were distributed throughout the Forest Service and 157 sets to operators. The latter number represents an increase of 17 over last year.

The amount and rate of fuel-moisture loss was found to be directly related to the amount of moisture present in the sticks. The noon and afternoon moisture can generally be predicted from the early-morning content on rain-free days of moderate or low relative humidity. On such days if the 8 a.m. moisture content is down to 9½ per cent, sticks may be expected to be above 8 per cent at noon but below 8 per cent before 8 p.m.

If used in this manner, however, careful check must be maintained of the weather forecasts, as subsequent rain, fog, or high relative humidities would reduce the hazard and completely alter the situation. Similarly, a strong wind later in the day would materially increase the rate of spread if an accidental fire occurred.

Investigations were conducted to test the relationship between solar radiation and fuel moisture. Results indicate that neither the hours of bright sunshine nor the intensity of same have any appreciable direct effect on the rate of drying of the sticks.

So far investigations indicate that the moisture content of the sticks is controlled primarily by the moisture content of the air. In the absence of visible moisture, such as rain or fog, the water-vapour content of the air is indicated by relative humidity.

To summarize, it is felt that, in order to be adequately informed on fire risk, it is still necessary to keep track of fuel-moisture content as indicated by hazard-sticks plus relative humidity and weather forecasts. It is also axiomatic that observations used for determining fire-hazard must be made at the location for which the hazard is to be determined.

Miscellaneous Projects

The hazardmeter, an Australian device used to replace fuel-moisture indicator sticks, was made up and tested. This meter consists of a strip of hemlock bonded to a strip of cedar and mounted vertically. The results obtained from two months of observation proved it to be too erratic and inconsistent to be of practical value.

A preliminary investigation was made to determine the effect of hanging hazard-sticks vertically instead of placing them in the customary horizontal position 1 foot above the ground. The difference did not appear to be of any real significance in the measurement of fire-hazard. When rain occurs, horizontal sticks usually become heavier than vertical sticks. This is largely due to water standing on the sticks; hence more water can soak into the wood. There is also more water on the stick-surface to be weighed with the wood. However, when dry weather follows the rain, the horizontal sticks dry much faster than do the vertical sticks. It was found that both sets contained the same amount of moisture before the dangerous degree of dryness is reached. This would indicate that the present practice of using horizontal sticks to represent haphazardly arranged forest fuels is justifiable.

FIRE-SUPPRESSION CREWS

Thirteen suppression crews were again fielded in 1950 in the Vancouver, Kamloops, and Nelson Forest Districts in the same locations as described in last year's Annual Report. In addition, a ten-man crew was located in the vicinity of Hillcrest, near Duncan on Vancouver Island.

As emphasized in past Reports, these crews again proved their value as a fire-suppression force, and the summary of their effectiveness is tabulated below. In addition, these crews averaged more than 35 per cent of their gross time on project work such as roads and trails, and the results of that work are included in the tabulation on page 57.

RECORD OF SUPPRESSION CREW ACTION, 1950

Size of Fire When Attacked	Number of Fires	Subsequent Spread (by Number of Fires)				
		¼ Acre or Less	Over ¼ Acre to 1 Acre	Over 1 Acre to 5 Acres	Over 5 Acres to 50 Acres	Over 50 Acres
Spot (up to ¼ acre)	90	81	8	1	----	----
Over ¼ acre and up to 1 acre	20	----	12	7	1	----
Over 1 acre and up to 5 acres	23	----	----	22	1	----
Over 5 acres and up to 50 acres	6	----	----	----	5	1
Over 50 acres	7	----	----	----	----	7
Totals	146	81	20	30	7	8

AIRCRAFT

Flying under the contract with Central British Columbia Airways Limited was continued during the 1950 season, and a total of 1,396 accident-free flying-hours was logged. By mutual agreement, an additional radio-equipped floatplane was included for the contract season, and the four aeroplanes were stationed as follows: Fort George, Kamloops, Penticton, and Nelson.

All aircraft, while based at these points, were again on call in any forest district east of the Cascades and Coast Mountains. In addition, the Kamloops aeroplane was available to the Vancouver Forest District and the Fort George aeroplane was available to the Prince Rupert Forest District east of the Cascades. All aircraft were capable of carrying over 1,000 pounds and were again radio-equipped and fitted with dropping-hatches. They were used for fire-patrol, spotting fires, and the transport of men, equipment, and supplies. Considerable skill has now been developed in three forest districts in parachute-dropping from these aeroplanes. By using war-surplus personnel chutes, loads as heavy as 250 pounds have been dropped, and fragile items, such as cases of eggs, power-saws, radios, and fire-fighting pumps, are now parachuted to fire-fighters, when necessary, without breakage.

To supplement the flying contract, local aircraft were chartered to a limited degree, particularly in the Prince Rupert Forest District and in the Fort George District east of the Rocky Mountains.

MECHANICAL EQUIPMENT

The approved complement of mechanical equipment was ordered early in the year and, as for the past two years, delivery was made with a minimum of delay in most instances. The items purchased are as follows:—

Automotive

Sedans	7
Coupes	10
Coaches	2
Suburban carryalls	10
Station wagons (four-wheel drive)	3
½-ton light deliveries (two-wheel drive)	17
1-ton light deliveries (two-wheel drive)	12
1-ton light deliveries (four-wheel drive)	18
Dodge power-wagons	1
1½-ton trucks	2
2-ton trucks	1
3-ton trucks	4
Total	87

The suburban carryalls listed above are a new type as far as the Forest Service is concerned and have proved very satisfactory for specialized uses.

Tankers

The three tankers mentioned in last year's Report proved quite satisfactory, and one additional unit was purchased this year.

Trailers, Tractors, and Maintainers

Six conventional two-wheel box trailers were obtained for hauling boats and general use.

One innovation this year was the fitting-out of the road-maintainer crews with conventional two-wheel, 14-foot, caravan trailers to enable the operators to stay out on the job in preference to coming in to some central headquarters each day. The trailers were equipped with fuel-storage tanks, which keep the maintainers supplied for a week. Four units were purchased for this work and proved satisfactory.

A special 28-foot cook-dining trailer was purchased for use of the Prince Rupert silvicultural crew. A considerable saving was effected by utilizing a standard caravan shell and under-carriage, furnishing the interior to suit Forest Service needs. The unit was generally quite satisfactory, although it is planned to make several structural changes in any future models as under-clearance was found to be insufficient for off-pavement operation.

Four crawler tractors were purchased—one Cletrac D.D.H. equipped with blade and drum for use in the Fort George District (Peace River area), one wide-gauge D-6 Caterpillar complete with blade and a Hystaway-backhoe-dragline and crane attachment for the Parks and Recreation Division, one International T.D. 9 complete with blade and drum for the Prince Rupert District, and one International T.D. 18 for use of our newly organized access-road engineering section, with initial operation at Salmon Arm.

Five Huber maintainers complete with attachments were obtained for use of the Vancouver, Nelson, Fort George, and Prince Rupert Districts, and the Reforestation Division.

Outboard Motors, Pumps, and Chain-saws

As only a very limited number of outboard motors were needed, little difficulty was experienced in obtaining eleven units in the following sizes: 5 horse-power, four; 8 horse-power, three; 16 horse-power, two; and 22 horse-power, two.

A total of sixty Bennett-MacDonald fire-pumps were constructed at the Forest Service Marine Station and, in addition, forty-two medium-weight commercially manufactured units were obtained.

During the year fifty-five chain-saws were obtained, practically all of which were the one-man type; of this number, four were allocated to silvicultural crews for use in slash-disposal and forty-four to various Ranger districts for forest-protection work. Two of these units are electrically operated from a light-weight high-frequency portable generator and are especially adapted for use in clearing roads and trails.

Miscellaneous Equipment

Five lighting plants were purchased, one of which was for use with the electric chain-saws mentioned, two for use of the Public Relations and Education Division to operate motion-picture projectors, and two for lighting Ranger stations; all units were in the 600–2,000-watt 115-volt category. An additional Warsop gasoline-driven portable rock-drill was purchased for use in the Kamloops Forest District.

Mechanical Inspection

The Mechanical Inspectors were assigned to district and division work as outlined in the 1949 Report. They were able to complete the inspections of all equipment in their respective areas and spent the balance of their time supervising maintenance and repair of the equipment. The allocation of Inspectors worked out very well, except for the one combined Inspector covering the Fort George and Prince Rupert Forest Service equipment plus any vehicles of the Lands Service and the Department of Finance in those areas. Distances are so great and so many units are in out-of-the-way locations where no garage facilities are available that more servicing is necessary by the Inspectors than in other forest districts. Ultimately, a separate Inspector will have to be allocated each district for adequate supervision of maintenance in the northern part of the Province.

FOREST SERVICE MARINE STATION

As reported last year, the Forest Service Marine Station was seriously damaged by fire and, due mainly to the slow process of getting the complicated electrical wiring installed, it was not until May 1st, 1950, that the whole plant was in full production. In December, 1950, a contract was let for a fully automatic sprinkling system throughout the entire plant, and this, together with the 50-foot spacing between our three main buildings, has greatly reduced the fire risk at the station.

In the marine-repair section, with three boat-ways available, it was possible to reduce the backlog of repair work on the Forest Service fleet. This included twenty-nine complete overhauls, four major rebuilds, and sixteen minor repairs, such as painting, etc., on launches from 20 to 84 feet in length. In new construction a variety of boats was built, including two 34-foot Forest Service standard one-man boats, one 20-foot special inboard motor-boat for the Queen Charlotte Islands, and one 30-foot shallow-draught lake-and-river launch for the Stuart Lake area. In addition, two pilot-houses and cabins were fabricated and shipped to Interior lake landing-craft, and a miscellany of repair work and installation on launch lighting plants and heavy-duty diesel marine engines was performed.

In the prefabricating-shop a wide variety of work was accomplished. This included the prefabrication and shipping of twenty-seven knock-down section buildings 20 by 24 feet, sixteen knock-down lookout buildings, and a miscellaneous collection of crates, tool-boxes, and launch furniture, such as stools, tables, and food-lockers. In addition, this year a new project was undertaken in the fabrication of certain types of office furniture for Forest Service offices throughout the Province. By the end of the year, thirty-eight map-cabinets and thirteen draughting-table tops were built.

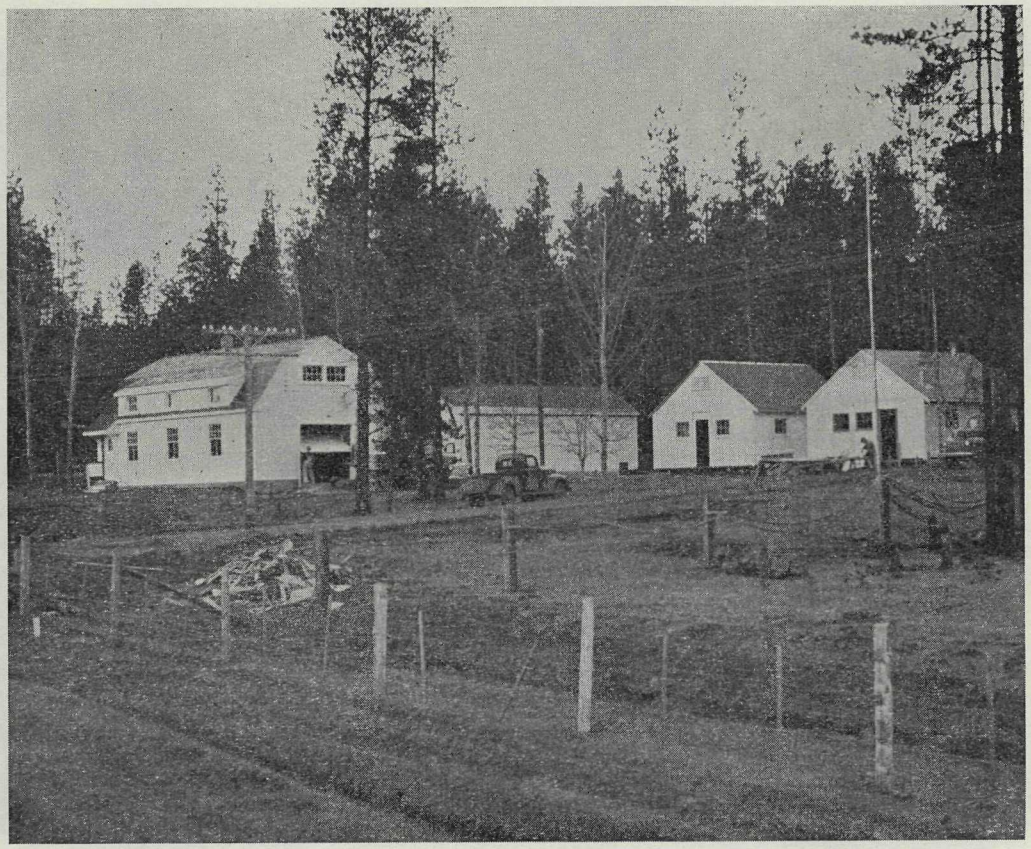
In the machine-shop section an increased overhaul programme was necessary because of the backlog of this work which had accumulated while the plant was being rebuilt. In all, 148 pumps and 47 outboard motors were received from various parts of the Province,

and these were overhauled, tested, and returned within the calendar year. In new construction, sixty Bennett-MacDonald portable fire-fighting pumps and their corresponding tool-boxes and tools were assembled and shipped. A revised model of the Bennett fire-finder for lookouts (first mentioned in the 1948 Annual Report) was perfected, and 15 units were completed while 100 more were 20 per cent complete by the end of the year. In addition, a miscellany of items used in the Forest Service were manufactured, such as fuel-moisture scales, straight-edges, special paper-punches, cubic-scale computers, cut-away models, and various machined items required by the prefabricating-shop or marine section of the Station.

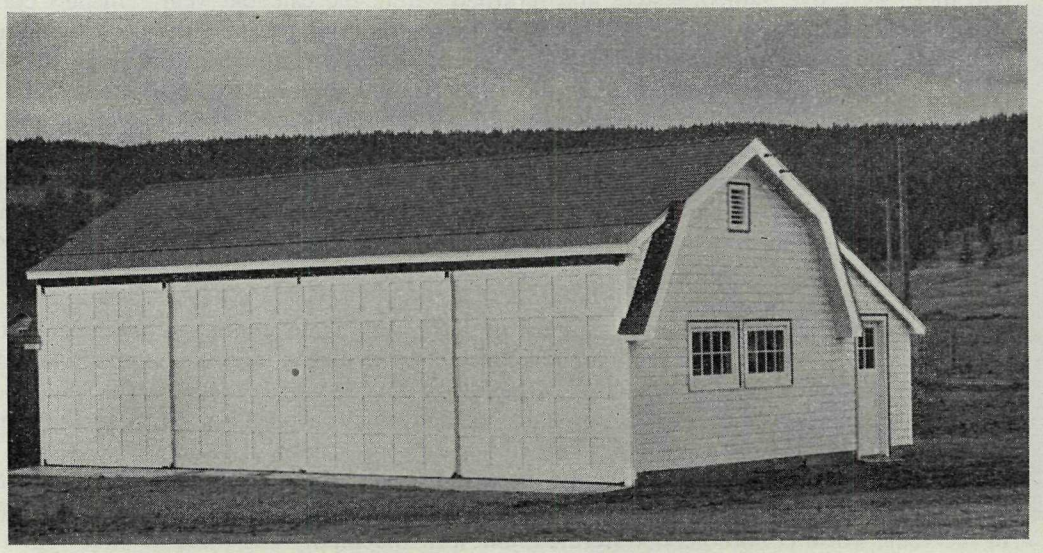
BUILDING AND CONSTRUCTION

The construction programme started in 1947 was again continued this year with excellent results. The competition among contractors was keen, and the competitive bids submitted did much to keep our costs of buildings down to a reasonable level while our standardized building plans kept the designing and engineering costs down to the bare minimum.

During the first half of the year the increased supply of materials and price stabilization continued in the same manner as the previous six months; however, in the latter half of the year, world conditions deteriorated, and now the supply and price of the essentials are in a state of flux.



Ranger station buildings, including sectional huts, 100-Mile House.



Standard four-car garage, Williams Lake.

Assistant Ranger headquarters, Arrow Park.

Of the forty-six major building projects under way this year, thirty-six have been completed, as shown in tabular form below:—

MAJOR NEW BUILDING PROJECTS FOR FOREST-PROTECTION AND ADMINISTRATION PURPOSES, 1950

Location	Type of Building	Construction Agency	Progress to Date
Alberni*	Warehouse	Contract	Completed.
Alberni*	Alterations to office	Contract	Completed.
Alert Bay	Renewing float	Day-labour	Completed.
Arrow Park	Assistant Ranger headquarters	Contract	Completed.
Burns Lake	Warehouse	Contract	Completed.
Canim Lake	Boat-house	Day-labour	Completed.
Creston*	Warehouse, four-car garage	Contract	Completed.
Columbia Crossing*	Assistant Ranger headquarters	Day-labour	Completed.
Columbia River*	Boat-house (at Mile 17)	Day-labour	Completed.
Chase	Office and stores building, four-car garage	Contract	Work proceeding.
Cowichan Lake	Office and stores building, four-car garage	Contract	Work proceeding.
Elko*	Ranger residence	Contract	Completed.
Fort St. James	Warehouse	Forest Service project	Completed.
Fernie	Four-car garage	Forest Service project	Completed.
Fort Fraser	Alterations to office and residence	Forest Service project	Work proceeding.
Grand Forks*	Four-car garage	Contract	Completed.
Hardy Bay	Assistant Ranger headquarters	Forest Service project	Completed.
Harrison Lake	Fill for building-site	Contract	Work proceeding.
Horsefly Lake	Boat-house	Day-labour	Completed.
Invermere	Four-car garage	Contract	Completed.
Kettle Valley*	Office and stores building, four-car garage	Contract	Completed.
Kaslo	Four-car garage	Forest Service project	Completed.
Kitsumgallum	Boat-house	Forest Service project	Completed.
Langford*	Warehouse	Contract	Completed.
Langford*	Alterations to office	Contract	Completed.
Merritt	Four-car garage	Contract	Completed.
Mission City	Alterations to pump-house	Contract	Completed.
Nakusp	Four-car garage	Contract	Completed.
Nelson	Enlarged warehouse and office building	Plans in preparation.	
100-Mile House	Office and stores building, four-car garage	Contract	Completed.
Powell River	Office and stores building, four-car garage	Contract	Completed.
Princeton	Four-car garage	Contract	Completed.
Pender Harbour	Office and stores building, four-car garage	Contract	Completed.
Port Moody	Office and stores building, four-car garage	Contract	Completed.
Penticton	Office and stores building, four-car garage	Contract	Work proceeding.
Port Clements	Boat-house	Labour contract	Completed.
Prince George	Warehouse	Plans in preparation.	
Queen Charlotte City	Office and stores building	Contract	Completed.
Quesnel	Warehouse	Plans in preparation.	
Sugar Lake	Boat-house	Day-labour	Completed.
Trout Lake	Assistant Ranger headquarters	Forest Service project	Completed.
Williams Lake	Four-car garage	Contract	Completed.
Vancouver	Storage-basin at Forest Service Marine Station	Contract	Work proceeding.
Vancouver	Sprinkler system at Forest Service Marine Station	Contract	Work proceeding.
Victoria	Storage-floor, warehouse	Contract	Completed.
Yahk	Assistant Ranger headquarters	Forest Service project	Completed.

* Denotes project started last year (*see* page 65 of 1949 Annual Report).

ROADS AND TRAILS

The road and trail programme featured for the first time in last year's Annual Report was continued on a similar scale in 1950. Again, the emphasis was placed on maintenance rather than on new construction.

In the summary below the work accomplished is segregated into light, medium, and heavy categories, based on the difficulty encountered.

	Light	Medium	Heavy	Total
	Miles	Miles	Miles	Miles
New road-construction	20.9	18.3	29.4	68.6
Road-maintenance	193.5	56.6	38.3	288.4
Total new road construction and maintenance	214.4	74.9	67.7	357.0
New trail-construction	24.0	16.3	43.8	84.1
Trail-maintenance	668.0	330.3	150.9	1,149.2
Total new trail construction and maintenance	692.0	346.6	194.7	1,233.3

RADIO COMMUNICATION

During the year 1950–51 expansion in communications added fifty-one transmitting units to the Forest Service network. A steady improvement in the reliability and speed of message-handling was reflected in the phenomenal increase in traffic handled by radio which, during 1950, totalled 33,000 messages.

New units added include nearly all Forest Service types, with the inclusion of F.M. equipment for the first time. Various types purchased were as follows:—

SPF portable trans-receiver	31
PAC 10-watt trans-receiver	2
HQT-200-8 200-watt transmitter, eight channels	3
RS-100-T 100-watt transmitter, four channels	2
MRT-25 25-watt marine transmitter, five channels	2
MRT-100 100-watt marine transmitter, five channels	3
110C 50-watt transmitter, three channels	1
F.M. 30-watt trans-receiver	6
F.M. 15-watt trans-receiver, mobile	3
Total	53

In the Prince Rupert Forest District, previously isolated from radio contact with the other districts and Victoria, 1950 brought a marked improvement in communication, with the installation of new equipment and the reorganization of the network. At headquarters a 200-watt transmitter of eight channels now connects Prince Rupert to Victoria throughout the daylight hours and puts a strong signal into all parts of the district. A steel tower supporting a multiple aerial system provides the district headquarters for the first time with an efficient outlet for its transmissions. Two Ranger stations were equipped with the new Forest Service development—the type RS-100-T transmitter of 100 watts which replaced the small 10-watt units found to be ineffective in that locality. Two Ranger stations were also equipped with remote-control receivers.

In the Vancouver Forest District three more Ranger launches were brought up to date with modern 100-watt five-channel marine transmitters, and Vancouver headquarters station was connected successfully to Ranger stations at Duncan and Langford by means of 150-megacycle F.M. Changes anticipated in the main transmitting and receiving equipment of the Vancouver station have not yet been carried out, but a new 200-watt transmitter was constructed and is nearly ready for installation. All Assistant Ranger launches are now equipped with 25-watt transmitters, and these have proved extremely successful.

In the Kamloops and Fort George Forest Districts no radical changes were made, although both districts, particularly the former, showed a marked increase in messages handled.

Nelson headquarters station was brought up to standard with a 200-watt transmitter, and it was intended to install a new six-channel remote receiver also, but this project has not yet been completed. The loss of the remote-control site and the necessity for evacuation of the area immediately forced the selection of a new site and the building of a new remote-control station during the late summer. In spite of difficulties and delays, this station was completed before weather conditions could stop construction, and results so far obtained are a great improvement over those obtained at the old site.

In Victoria, in addition to a continuous programme of construction work on new equipment, experimental work was carried out with F.M. on 150 megacycles with the present very useful Victoria-Vancouver circuit as the result. Experimental work was done also on the design for a new-type light-weight " Fire Portable " transmitter-receiver. This unit has not been tested in the field, and results will not be known until another fire season has passed.

The use of F.M. for the first time during 1950 provided a small complete network which proved extremely practical and efficient in traffic-handling. At the same time, much useful information was obtained regarding the behaviour of frequencies of 150 megacycles and above in relation to long-distance transmission over rough terrain. In consideration of the use of F.M. on a large scale to replace medium frequencies, results obtained so far lead us to the following conclusions:—

(*a*) Distances of 100 miles or over can be achieved with a frequency above 150 megacycles.

(*b*) To cover any distance over 10 miles successfully, a relay or repeater point between 800 and 1,000 feet high is absolutely essential.

(*c*) Repeater points, to be practical, must have both road and power facilities available, and must be below snow-level.

(*d*) Mobile F.M. transmission will be successful only when a number of repeater stations are in operation.

(*e*) F.M. units, when carefully established as a result of experiments by a technician, definitely solve the noise-level problem and show little tendency to fade as a result of weather conditions.

(*f*) Expansion on the very high frequencies is possible, but not on a wide scale until power and road facilities are extended to a large number of suitable high points. The other major difficulty is the high cost involved, which will confine Forest Service installations to the Vancouver Forest District for the present, unless the Service is denied the use of medium frequencies.

No changes in Forest Service frequencies were made by the Department of Transport during the year, but six new frequencies were added, between 152 megacycles and 174 megacycles, for F.M. use only.

At the close of 1950 the number of sets in use, exclusive of those ordered but undelivered, is as follows:

Type	Number	Type	Number
SPF	331	MRT-100, MRT-25, marine	24
PAC	54	Remote receivers—	
S-25	5	Headquarters	6
5-50	2	Ranger	8
100-watt composite	1	F.M.	8
RS-100-T	2	F.M. mobile	2
HQT-200-8	5		
		Total, all types	448

Messages handled by all forest districts during the year, exclusive of weather reports, unnumbered notes, and conversations, reached the following totals (the totals for 1949 are shown also for comparison):—

District	Number of Messages 1949	1950
Prince Rupert	1,338	3,170
Fort George	2,078	2,831
Kamloops	2,023	2,990
Manning Park	------	448
Vancouver	5,952	10,386
Nelson	2,211	4,308
Victoria	5,731	9,309
Totals	19,333	33,442

The number of messages for 1950 was nearly double that for 1949, the phenomenal increase being due, in part, to improved equipment and the addition of the F.M. circuit.

SLASH-DISPOSAL AND SNAG-FALLING

Because of climatic conditions, results of slash-disposal in the Vancouver Forest District in 1950 were disappointing.

Spring slash-burning was delayed by the late spring and the heavy snow which remained on many of the slash areas until after the opening of the fire season. The opportunities for slash-disposal in September were brief because of the protracted fall hazard and necessitated working the week-end of September 30th by those operators who secured optimum results. Rain on October 2nd made further broadcast-burning impossible. Due to these factors 45 per cent of the 47,800 acres of slash requiring burning was not done this year (for reference *see* Tables Nos. 44 and 45 of the Appendix).

The same tables show the increasing acreage of slash where spot-burning only is required—16,890 acres in 1950. Since only a small fraction of this acreage is actually burned, the true area of slash which was not required to be burned is much greater than the 28,736 acres which Table No. 44 indicates.

Throughout the year, snag-falling in the Vancouver Forest District logging operations remained at a high level of performance, as indicated in Table No. 42. In addition, progress was made in snagging selected areas of old snags occurring in logging done prior to the implementation of section 113 of the " Forest Act." The planning of these fire-breaks was co-ordinated with the work of the Reforestation Division and the snag-free planted areas. In 1950, 1,500 acres were snagged either by contract or by day-labour at Lower Campbell Lake, Brewster Lake, Robertson River, and Rosewall, and this work was paid for from the accumulated assessment fund. In addition, the Reforestation Division snagged 11,440 acres in 1950 in advance of planting (*see* the section of this Report under " Reforestation ").

The slash and snag tables in the Appendix were increased and rearranged this year to give a more comprehensive picture of what happened during 1950 in this very important phase of forestry work.

FIRE-LAW ENFORCEMENT

In an attempt to reduce the number of man-caused fires in 1950, information was laid in forty-three cases during the year. As will be noted from Table No. 58 (*see* Appendix), only one of these cases was dismissed for lack of sufficient evidence, and the number of cases brought into Court was increased by 38 per cent. Campers and smokers caused 6 per cent more fires in 1950 than the previous ten-year average (*see* Table No. 51), hence rigorous prosecutions for infractions will have to be continued next year.

FOREST CLOSURES

Again it was unnecessary to hamper the Coast industry by invoking a general closure. As in 1949, many operators voluntarily went on early-morning shift or closed entirely when local hazard build-ups occurred.

Regional closures were again invoked where warranted by existing forest values and hazard conditions. In some cases these were enforced by closure gates and Forest Service attendants. In other less-frequented areas, warnings of the closures through the press, radio, and poster advertising sufficed.

FOREST CLOSURES, 1950

Area	District	Effective Date	Termination Date
Sayward Forest	Vancouver	July 5	Sept. 25
Bear Creek	Kamloops	July 7	Oct. 2
Koch Creek	Nelson	July 27	Oct. 5
Hartley Creek-Sulphur Creek	Nelson	Aug. 5	Oct. 5
Lamb Creek	Nelson	Aug. 11	Oct. 5
Anderson-Five Mile Creek	Nelson	Sept. 22	Oct. 5

CO-OPERATION—OTHER AGENCIES

The usual excellent co-operation from honorary fire wardens must be acknowledged with thanks and appreciation. In 1950 the honorary fire warden organization numbered 837 throughout the Province. These public-spirited citizens voluntarily undertake fire-fighting duties in their local communities year after year, thus augmenting the Forest Service staff and performing a most valuable function in the forest fire-suppression organization.

In addition, there were 694 fire-prevention officers appointed under authority of section 123 of the "Forest Act." These men are appointed at the request of their employers in forest industry and have the same authority as a forest officer on the particular operation with which they are concerned.

Acknowledgment must again be made for the excellent co-operation received from the Royal Canadian Air Force and from commercial air lines and private pilots in detecting and reporting fires.

FOREST-INSECT INVESTIGATIONS*

FOREST-INSECT SURVEY

The forest-insect survey in British Columbia enjoyed the closest support and co-operation of the British Columbia Forest Service during 1950. Additional to insect collections, the Forest Service field staff contributed greatly in providing special reports on insect conditions and through the provision of travel facilities by road, water, and air. Survey collections for the year totalled 6,317, of which 776 were submitted by Forest Service personnel as follows: Vancouver District, 245; Prince Rupert District, 108; Fort George District, 139; Kamloops District, 153; and Nelson District, 131. Of the many pests investigated during the year, two are of major importance at present—the spruce bud-worm and bark-beetles.

Forest-insect investigations camp occupied during 1950 at Bolean Lake—the study centre for the spruce bark-beetle.

Spruce Bud-worm.—An extensive outbreak of the spruce bud-worm was discovered near Burns Lake in the Prince Rupert Forest District. Covering an area of some 380 square miles, it is bordered on the west by a line from Burns Lake to Babine Lake, extending eastward about 36 miles to an apex at Helen Lake, including Augier, Pinkut, and Taltapin Lakes. Small infestations occur on the north side of Babine Lake opposite Donald Landing and on the south side near Topley. Ranger S. T. Strimbold, British Columbia Forest Service, Burns Lake, reported continuing infestation eastward to Fort

* Prepared by Forest Insect Investigations, Science Service, Dominion Department of Agriculture, Victoria and Vernon Laboratories.

St. James as observed from the air. Complete defoliation occurred only on the understory of balsam, particularly where it occurred below an overstory of pine. General defoliation on spruce and balsam was about 20 per cent. Evidence was not available to establish whether or not this outbreak represents a one- or two-year life-cycle, since 1950 was the flight year for moths of both the one- and two-year-cycle bud-worm. In view of the spruce-balsam forest associated with this outbreak, a two-year-cycle is suggested, as is typical of bud-worm in British Columbia on these hosts. If such is the case, the seriousness of this outbreak is lessened, since severe defoliation occurs only at alternate years, giving the tree an opportunity to recuperate.

Elsewhere in the Province the bud-worm was particularly active, with noticeable defoliation in the Fort George District as follows: Bowron-Isaac Lake chain north-west to Narrow Lake, an area approximately 50 miles long by 20 miles wide; between the Crooked and Parsnip Valleys; headwaters of Torpy River west of Nation River.

In the Kamloops District localized infestations were recorded at Sock and Johnson Lakes, Cicero Creek, Martin Creek, Monashee Summit, Silver Hills, and Bear Creek. In the Nelson District there was light to medium infestation at Inonoaklin Crossing and at Kettle Crossing.

The actual damage to timber by this insect has been minor despite its activity, and there is little to indicate any timber losses in the immediate future.

Bark-beetles.—Bark-beetles constituted the most serious insect in the Interior forests for 1950. Extensive infestations of the mountain-pine beetle, *Dendroctonus monticolæ* Hopk., have occurred during the past several years in the lodgepole-pine stands of the East Kootenays. The largest of these are in the White River valley, between Forster and Frances Creeks, on Steamboat Mountain, and in the Windermere Creek valley. The latter infestation mushroomed in the past two years and now covers the north slope of the valley for a distance of about 6 miles.

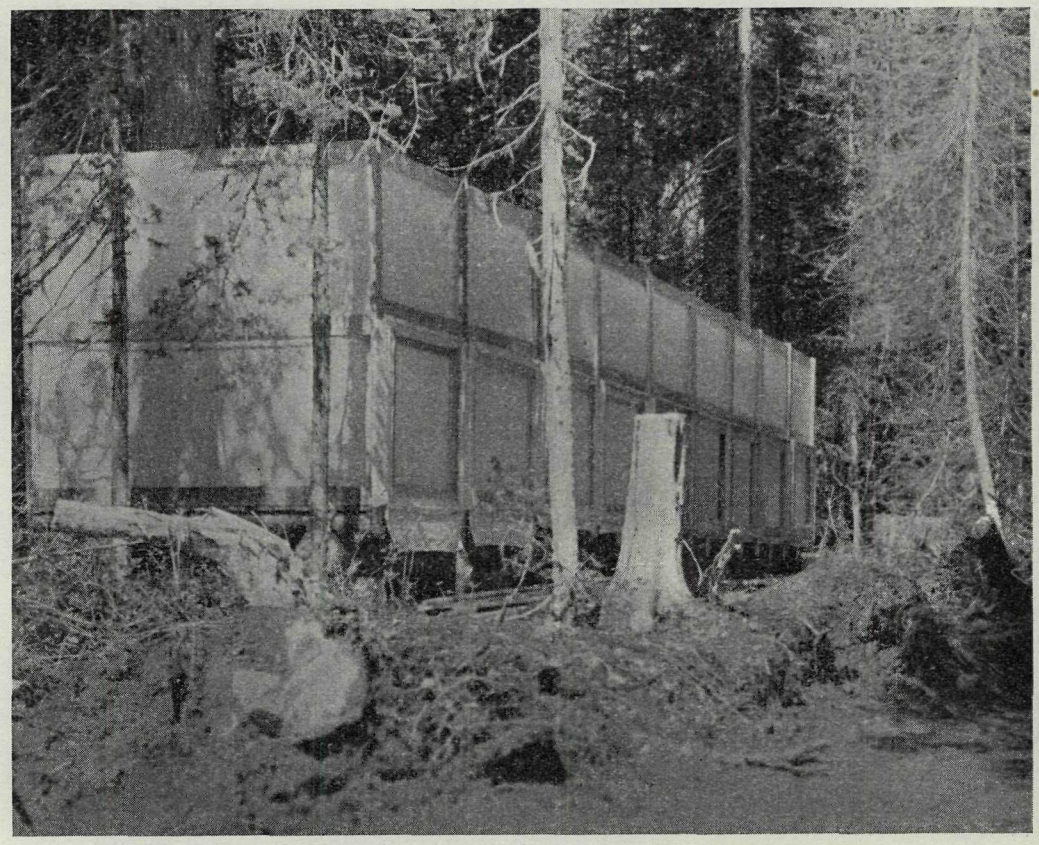
The mountain-pine beetle has continued to spread through the white-pine stands of the Revelstoke and Shuswap Lake areas. Active infestations occur near Miles 42, 47, and 54 north of Revelstoke, while to the south the beetle is active on Mount Macpherson, at Greenslide, and near Arrowhead. In the Shuswap Lake area most of the white pine between Cape Horn and Encounter Point on the west side of Seymour Arm is now under attack, and other areas of infestation occur on Anstey Arm, south of Cinnemousun Narrows, and near Celista.

Although there has been no major outbreak of the Douglas-fir beetle, *Dendroctonus pseudotsugæ* Hopk., this species has been taking a steady annual toll of mature and overmature trees throughout the range of Douglas fir in the Interior of the Province.

The importance of the continual loss which may, in the aggregate, amount to as much as 40 per cent of the merchantable lumber on an area, has not been fully appreciated in the past. This year an appraisal has been made of an endemic infestation near Quesnel as a preliminary step in an investigation of the problem in relation to forest management.

SPECIAL STUDIES

Engelmann Spruce Bark-beetle.—An intensive study of the relationship of bark-beetle increase and forest management was initiated in the spruce-balsam stands at Bolean Lake in the Kamloops Forest District. This infestation is the first major outbreak in British Columbia since the disastrous outbreak in Colorado which started in 1939 and resulted in an estimated loss of from three to four billion board-feet of Engelmann spruce. This project has three objectives: (1) To determine the cause of the population build-up, (2) to assess the influence of the selective-logging method in use in the Bolean Lake area on this build-up, and (3) to study the life-history and habits of this species under the conditions of the spruce-balsam forests of the Southern Interior of British Columbia.



A " brood cage " housing infested spruce logs for studies on the spruce bark-beetle, Bolean Lake, 1950.

Information on the first two points has been gathered by an intensive cruise of the area in question and extensive cruises of the adjacent stands to determine the nature, extent, and distribution of the infestations, and by the intensive examination of a 1-acre plot in the centre of the original infestation to determine the progressive development of the population, the optimum breeding areas, and the relationship of stand treatment to the build-up. In addition, reproduction plots were set up to see whether or not part of the cost of a bark-beetle control project might not justifiably be charged against reforestation. The bionomics of the species are being studied by the felling of trap-trees and the construction of brood-cages. With only one season's work completed, conclusions are indefinite as yet. There should result, however, some very definite information on bark-beetle population build-up as related to blow-down and slash following selective logging, and the significance of resultant regeneration as developed from present logging practices in this forest type.

Deterioration of Hemlock-looper-killed Timber.—The mortality of timber defoliated by the hemlock looper on Vancouver Island has been traced through the study of sample plots established throughout heavily attacked stands. The initial defoliation, which occurred during 1945 and 1946, predisposed epidemics of secondary bark-mining insects that have succeeded in killing many weakened trees. This subsequent mortality culminated between 1948 and 1949, when secondary insect populations reached a peak. Further killing between 1949 and 1950 dropped to such a low proportion of the total damage that the examination of the permanent sample plots will probably be discontinued during 1951.

Joint studies pertaining to the loss in volume and value of this dead timber were continued during the summer in co-operation with the Dominion Forest Pathology Laboratory and Bloedel, Stewart & Welch Limited. Insects have not been primarily responsible for the loss in either volume or grade of dead Western hemlock. Instead, the decay organism, *Fomes pinicola* (Sw.) Cke., has not only caused most of the direct loss, but has been responsible for considerable loss due to breakage. The reduction in volume-return from large bodies of dead hemlock has been extensive enough to warrant the discontinuation of salvage operations in some localities.

New forest-insect laboratory erected at Vernon in conjunction with British Columbia Forest Service Ranger establishment. This building will be available for occupancy about April, 1951.

Chemical Control of Ambrosia-beetles.—A field experiment designed to test the efficacy of several chemicals in preventing excessive " pinworm " damage in recently felled timber was carried out at Cowichan Lake. Eight second-growth Douglas-fir logs were felled and treated in July. When these were examined in October, it was found that benzine hexachloride, when applied either in a fuel-oil solution or in a water emul-

sion, proved successful in preventing a moderate ambrosia-beetle attack. These results are encouraging because they indicate that the transportation cost and added fire-hazard involved in applying an oil spray may be eliminated by using benzine hexachloride in a water emulsion. Further work in chemical control of these insects is projected for 1951.

Forest-nursery Insect Studies.—The strawberry root-weevil assumed importance during 1950 in the Duncan Nursery. At the time of planting, seedlings with roots attacked were found in a number of beds. Later examination revealed a light but rather general population in the 2–0 beds. Development of larvæ in these beds was kept under observation and, when young adults were noted, poison-bait barriers were spread about the nursery boundaries. As a result, hundreds of potential invading beetles from adjoining land were found dead amidst the bait. It is unlikely that populations of any account became established within the nursery, and protection of the 1952 crop seems to have been achieved. Similar measures may be required in 1951.

Evidence of white grubs was found for the first time at the Duncan Nursery in 1950. Although now present, the insect so far is not important. At the Quinsam Nursery the insect showed both a decline in attack and activity during 1950. This is no doubt due to the present crop growing upon land treated in 1949 with benzine hexachloride.

Since soil-insects and nursery-rotations provide rather complicated interrelationships, considerable attention and study were directed to analysing mechanical requirements for chemical control. It appears that present nursery equipment can be inexpensively adapted to provide these facilities and that no interference with ordinary nursery procedures seems necessary.

FOREST-DISEASE INVESTIGATIONS*

The activities of the forest-disease laboratory were expanded during 1950 to provide for studies of extended duration in forest-disease examination and control. These developments were made possible in large part through the co-operation of the British Columbia Forest Service by reserving selected areas of representative forest land for continuing pathological research. Thus a 70-acre experimental forest was reserved in second-growth Douglas fir and Western hemlock on Vancouver Island and 140 acres were reserved in the Nelson District for continuing research on the pole-blight disease of Western white pine. In addition, 25 acres were set aside in the Fort George District to provide for an analysis of the progressive deterioration of wind-thrown spruce.

Field personnel during 1950 totalled forty-five, of which twenty-one were permanent members of the forest-disease laboratory and twenty-four were student assistants and labourers. The further co-operation of the Forest Service in providing six of the latter personnel is hereby gratefully acknowledged.

Publications distributed during 1950 included the following:—

Browne, J. E.; Foster, A. T.; and Thomas, G. P.: A Preliminary Investigation into the Decay Losses Sustained in Western Hemlock and Amabilis Fir in the Upper Kitimat Region. Dom. Lab. of For. Pathology. Mimeographed. May, 1950.

Foster, R. E., and Craig, H. M.: Preliminary Decay Analyses of Western Hemlock in the Big Bend Region of British Columbia. Dom. Lab. of For. Pathology, Victoria. Mimeographed. March, 1950.

Thomas, G. P.: Two New Outbreaks of *Phomopsis lokoyæ* in British Columbia. Can. Jour. Res., C, 28: 477–481. October, 1950.

DISEASES OF MATURE AND OVERMATURE FORESTS

1. Studies of decay in mature and overmature Douglas fir were conducted in the Nimpkish Lake area, Vancouver Island. Preliminary evaluations of the data accumulated in other areas of the southern coastal region over the past several years indicate that, under normal conditions, heart-rot losses are of secondary importance in the utilization of this species. Over most of the region average losses from decay were found to be less than 10 per cent. At Bella Coola and at Nanoose, however, losses in excess of 15 per cent were record. Further analyses of the basic data are in progress.

2. Investigations of decay in Western hemlock and amabilis fir were continued in the Prince Rupert Forest District. A further sample of 8.25 acres was obtained in the Lakelse and Kitsumgallum areas, bringing the total number of examinations in this region to 472 hemlock and 406 fir. Present results indicate that the excessive cull losses recorded during 1949 do not apply over the entire region. Thus current analyses provide cull deductions of approximately 45 per cent in Western hemlock and 23 per cent in fir, as compared with the previous reference to 67 and 62 per cent respectively. Continuing analyses are being undertaken in an effort to define the varying stand conditions and thus provide a direct measure of hidden defect.

3. The inventory examination of Western hemlock in the Big Bend region received further consideration during the past year. Plots were examined at Wigwam and between Miles 30 and 48 on the Columbia River north of Revelstoke. Twenty-eight plots comprising a total of 7 acres and 668 hemlock of merchantable size have now been analysed. Present analyses indicate that the highly defective condition reported in 1949 extends over the entire region of mature hemlock. Thus cull factors in excess of 60 per cent appear to be consistent within sites 80 and 100. Further sampling in younger stands and on better sites is contemplated.

*This section of the Report has been prepared by the Laboratory of Forest Pathology, Science Service, Dominion Department of Agriculture, Victoria, B.C.

4. Four acres in the spruce-balsam type were examined in the vicinity of Summit Lake in the Fort George Forest District. Sixteen plots were felled, yielding a total of 335 spruce and 67 amabilis fir. Additional trees were felled to provide an adequate

Trunk symptoms of the pole-blight disease of Western white pine, showing long narrow lesions adjacent to the inner bark and associated pitch exudation.

sample in the larger diameter-classes. The sample was representative of typical 200-year-old spruce-balsam stands on site 100 in the region under consideration. Decay losses amounted to 16 per cent in spruce and 24 per cent in balsam in board-foot measure.

Butt-rots were the cause of most decay in both species and, in addition, contributed to excessive wind-fall.

5. Examinations of hemlock-looper-killed stands on Lower Vancouver Island were continued. It was found that decay and breakage losses in Western hemlock had increased approximately 20 per cent over the past two years, cumulative defect amounting to 31 per cent exclusive of normal heart-rot. The probable net recovery of hemlock, excluding losses subsequent to felling, was estimated at approximately 55 per cent of the total stand volume of this species.

6. Twenty plots were established in the Crescent Spur area, Fort George District, to provide for the continuing analysis of deterioration in wind-thrown spruce and amabilis fir. A total of 1,069 trees, of which 505 were standing and 564 totally or partially uprooted or broken, were tagged for future study. Of this latter group, 80 per cent were dead, 20 per cent living. Preliminary analyses indicate that existing losses are confined to sap stain.

DISEASES OF IMMATURE FORESTS

1. Seventy acres of second-growth Douglas fir and hemlock were placed in reserve for pathological studies in the Alberni region. It is intended to establish permanent sample plots in order to study the nature, and to follow the course, of disease in immature stands. Experimental thinning and related operations will be carried out for purposes of disease-control.

2. An intensive survey of the Douglas-fir root-rot caused by *Poria weirii* was undertaken in the coastal region. Present results indicate the existence of different strains of the fungus and a varying susceptibility of Douglas fir, hemlock, and Western red cedar. Thus cedar appears to be relatively free from this disease on the Coast, yet Douglas fir may be subject to considerable loss under similar stand conditions. In the Interior, cedar and fir appear to be attacked with equal vigour. Further investigations will be undertaken to determine the silvicultural implications of these findings and the effect of thinning as a control measure.

3. A detailed examination of the blister-rust control programme in Wisconsin was undertaken during 1950. It was found that certain of the existing techniques employed in the isolation and testing of resistant trees may be applicable in British Columbia. Cuttings of Eastern *Ribes* sp. were established in an experimental disease-garden on Lower Vancouver Island to provide for the possible development of geographic races of the blister-rust organism.

4. A meeting was held in the Arrow Lakes region for the purpose of reviewing current investigations on the pole-blight disease of Western white pine. Twenty-seven American and Canadian foresters and pathologists were in attendance. An examination of 50-year-old pine in the Shawnigan Lake area, Vancouver Island, supported previous indications that the distribution of pole-blight in British Columbia was confined to the Interior region. Surveys conducted in the vicinity of Shuswap Lake, north of Sicamous, extended the known distribution of the disease to this area. Permanent plots were established in the Silverton area to determine the progress of the disease and the effect of pine mortality on associated species. In addition, sanitation cutting was undertaken to determine the feasibility of protecting healthy pine through the elimination of infected trees. A total of 255 pines was removed from 8.1 acres. Eighteen permanent sample plots were established to study the subsequent progress of the disease in the remaining 210 pines. Inoculation experiments were conducted, using the most frequently occurring organisms isolated from the inner bark and lesions of infected pine.

5. An investigation of a report of heavy cankering of a 53-year-old stand of lodgepole pine in the Kelowna area, Kamloops Forest District, revealed an epidemic incidence of infection by two organisms. Heavy damage was caused by a rust, *Cronartium stalactiforme,* and a canker organism believed to be *Atropellis* sp. Combined infection was as

high as 100 per cent in localized areas. It was evident that heavy infection occurred early in the life of the stand and that the present infection is not spreading appreciably. Infection in adjacent areas was not high.

6. An examination of lodgepole-pine stands in the Cariboo District indicated severe infection by the mistletoe, *Arceuthobium americanum,* from Clinton through to Williams Lake. It appears that this parasite has been active for a number of years and that many of the infected trees will eventually be killed or will fail to reach merchantable size within an economic rotation.

Severe infection of the lodgepole-pine mistletoe, **Arceuthobium americanum**, north of Clinton.

7. The first authentic record of Douglas-fir mistletoe, *Arceuthobium douglassii,* in British Columbia was obtained in the vicinity of Keremeos. Heavy infections were noted in restricted localities on mature trees and on reproduction. Further records of the disease were obtained at Westbank, Kelowna, and in the Kootenay District from Gray Creek to Sirdar.

DISEASES OF NURSERY STOCK

Postponement of the research programme of nursery disease was necessitated through the temporary transfer of personnel to the University of Michigan. Continuing research is being conducted at this latter location with equipment and facilities not at present available in British Columbia. A general survey of conditions at Duncan, Quinsam, and Green Timbers Nurseries indicates, however, that mortality losses through disease were at a minimum during 1950.

FOREST RANGER SCHOOL

Due to the introduction in 1949 of a three-term course spread over one and a half years, the fourth class to attend the Ranger School took its third and final term between January 5th and April 6th, 1950. This term was devoted to the following subjects:—

	Number of Hours
1. Forest Management	110
(*a*) Review of the " Forest Act."	
(*b*) Management Policies and Procedures.	
2. Grazing Management	40
(*a*) " Grazing Act," "Animals Act," etc.	
(*b*) Administration of Crown Range.	
3. Log-scaling, Theory and Practice	90
4. Stumpage Appraisals	25
5. Silviculture (Silvics and Application in British Columbia)	80
6. Forest Pathology (Tree-diseases in British Columbia)	16
7. Botany (Identification of British Columbia Trees and Woods)	35
8. Forest Inventory Mapping	30
9. General Review, " Operation " Subjects	30
Field-trips, Miscellaneous	44
	500

It is not possible to accurately assess the value of the extra three months' training to the graduates in terms of increased proficiency, but some advantages are clear. With younger and less-experienced candidates to draw from, basic instruction in fundamentals requires more attention, as a substitute for the knowledge which it was assumed former classes had gained from experience. The instructional staff has increased time for this further elaboration of each subject as required. The students themselves are under less pressure and can be expected to retain more of the knowledge imparted. Finally, with the course spread over three terms, it is possible to spend more time on reviews and correcting weaknesses which show up in the summer interval when the students are engaged in putting their newly acquired knowledge and skills to use.

The fifth, or 1950–51, class reported to the School on September 18th and immediately commenced the three months' course of study outlined below. There are twenty-one students in the class with representation from all forest districts, as shown in Table No. 60 of the Appendix. These men will continue their studies during 1951 after a three weeks' break for Christmas and statutory holiday leaves.

First-term Curriculum, September 18th to December 19th, 1950

Operation	Number of Hours	
1. Fire Law and General Operation Procedure	70	
2. Preliminary Fire Organization	60	
3. Construction Techniques	50	
4. Office Methods	20	
5. Public Speaking	30	
		230

General

1. Mathematics Review	20	
2. Surveying (Part 1)	150	
3. Forest Inventory Mapping	30	
4A. Elementary Botany	40	
		240
Tests and Miscellaneous		30
		500

EXTRA COURSES

A special one-week course was given to lookout-men appointed to the Vancouver Forest District. This followed the spring term and is the third course of this nature given at the School.

In addition to the necessary training in the detection and reporting of forest fires, instruction in the use and maintenance of weather-recording instruments was stressed.

A noticeable point in respect to this short course is that, although the men are for the most part definitely inexperienced (the majority are still at university or fresh from high school), reports again indicate that their work during the season has been quite satisfactory. While this may well be due to the type of men the Service has been fortunate enough to obtain, there is, nevertheless, much for a " green " man to learn before he can fulfil his duties adequately on the lookout. Perhaps due to the type of man required and the nature of the work, there appears to be a large turnover in this position. With new men coming to the job each year, the course covers an important field.

BUILDING AND GROUNDS

A number of improvements to the buildings were made by the staff during the summer recess. A considerable amount of repainting was found necessary and was accomplished.

A new building, 16 by 14 feet, was erected by the staff to accommodate material and equipment used in the maintenance of the grounds. In addition, a small frost-proof building was put up to house two Bickle-Seagrave pumps, adjoining the 16,000-gallon water-reservoir constructed last year. The two pumps supply water under adequate pressure for fire-fighting emergencies to two stand-pipes installed at strategic locations with respect to the School buildings.

Paving of the entrance-road from the gate on the Nichol Road to the driveways leading to the main buildings was completed. The road leading to the garage was given a flush-coat and fine gravel finish.

Landscaping and planting proceeded throughout the summer; the grounds now compare very favourably with any similar institution. Lawn curbing (cement), where required to protect flower beds, and lawn edging have been constructed, and the whole is now well on the way to finished grounds.

ACKNOWLEDGMENTS

The School again wishes to acknowledge with thanks the assistance received from the undermentioned organizations, whose aid materially added to the efficacy of the courses: The Division of Plant Pathology, Dominion Department of Agriculture (Forest Pathology); the Division of Entomology, Dominion Department of Agriculture (Forest Entomology); ex-Provincial Police (Law Enforcement); St. John Ambulance Society (First Aid); the University of British Columbia for its co-operation and accommodation at its Loon Lake camp in the Haney Forest (where the School carried out survey and forest mensuration exercises); B.C. Forest Products Limited, Youbou, for transportation in connection with field work in the Nitinat Valley; and to the Victoria Lumber Company for transportation and assistance in slash-disposal and logging-inspection field work.

PUBLIC RELATIONS AND EDUCATION

Increasing volume and diversity in all phases of the Division's work during the year stressed the need for expansion in staff, equipment, and working-space. It is particularly desirable that an additional technician be secured for the Photographic Section if the present volume and quality of work is to be maintained. Additional working-space and improved facilities in the form of a proper darkroom, projection-room, general workroom, and storage-space for publications, exhibits, and the photographic library are urgently required.

PRESS AND RADIO

The Division produced a series of six forest-protection advertisements, each of which appeared, during the five-month fire season, in ten daily and seventy-four weekly newspapers. In addition, the series, in part or in whole, also appeared in eighteen periodicals and trade journals. This coverage represented a modest increase over the previous year of three weekly newspapers and three periodicals. The layout, copy, and scheduling of this series was the work of the Division, while the artwork was produced by the Government Printing Bureau. The issuing of insertion instructions to the various publications was handled through an agency.

Pre-fire-season advertisements, three in number, were placed in the daily and weekly press prior to the fire season. These advertisements appeared in seven daily and thirty-five weekly newspapers in the Vancouver Forest District and in two weeklies in the Peace River Block, Fort George Forest District. Copy for these advertisements was the product of the Division, and insertion instructions were issued directly to the publications concerned.

In addition to these two series of forest-protection advertisements, twenty-four special layouts with copy were prepared for a like number of publications reaching a wide cross-section of the population.

The Division prepared and released, through the Legislative Press Gallery, a number of special items of interest concerning the activities of the Service.

The forest-protection and educational radio campaign was doubled over that of the previous year, which enabled the broadcasting of fifty-two fifteen-second flash announcements over each of the eighteen radio stations operating in the Province. Copy for these broadcasts was produced by the Division, and the scheduling of the standard portion of the series was handled directly with the stations. Fire-hazard messages were scheduled by district offices. Special messages were prepared and beamed to particular areas in response to requests received from district offices.

The Division is again indebted to both press and radio for their generous support in space and time in assisting our protection and educational programmes, and extend thanks for this invaluable co-operation.

PUBLICATIONS

The Annual Report of the Service for the calendar year 1949 was edited and distributed by mailing-list and, in response to subsequent requests, to a greater number of interested persons than ever before. Three technical articles, by members of the Research Section of the Forest Economics Division, were edited by the Division and published as Technical Publications T. 33 and T. 34, and Research Note No. 17. The two technical publications were first published as contributions to the Forestry Chronicle, the Service subsequently purchasing and distributing reprints. Assistance was given to other divisions of the Service in the production of one Forest Resources Bulletin (No. 4) and three popular bulletins. In addition, the Division compiled and issued the first of a series of illustrated booklets, designed especially for school distribution, entitled "Illustrated Forest Activities."

The increasing interest in and demand for literature of all classes on forestry was demonstrated by the fact that three publications went into their second printing after only one or two years of distribution, and two older ones were also reprinted. In addition, arrangements were completed to reprint 40,000 copies of the children's booklet "How the Fir Forest Was Saved"; the first edition was distributed to some 35,000 school-children during the spring of the year. The film catalogue was also revised and reprinted.

The Division designed and distributed the 1951 Forest Service calendar, and produced twelve personnel news-letters, one personnel directory, and two lists of publications.

Two special-event souvenir folders were printed to commemorate the opening of Pine Woods Lodge, Manning Park, and the Mount Seymour Park Road. One hundred thousand cards urging car-riders to use the ash-trays were printed and distributed to drivers being examined for licences, through the co-operation of the Motor-vehicle Branch.

PHOTOGRAPHY AND MOTION PICTURES

During the year the following photographic prints were supplied to other divisions of the Service, outside publications, students, and other interested parties requesting this service:—

Description	Number
Enlargements—	
8 by 10 inches	1,403
5 by 7 inches	145
Jumbo prints	125
Magna prints	612
4 by 5 inches	141
	2,426
Contact prints	1,020
Total prints	3,446

In addition to these, contact index prints were made of the 893 new negatives entered in the Division files. This volume of work entailed much overtime effort and, in order to maintain the quality and quantity of photographic work in the future, the acquisition of an assistant to the photographer, and the construction of proper darkroom facilities are vital.

A large volume of photographic work on new buildings, launches, logging methods, types and stands, and research projects was completed on behalf of other divisions of the Service.

Fire and weather charts of the Operation Division, which have been stored for reference in their original large bulky form, are in the process of being photographed and reduced to 11- by 14-inch size for filing purposes. At the end of the year 75 per cent of the charts of the Vancouver Forest District had been photographed. The remaining charts will be photographed as time permits.

Three colour-and-sound motion-picture films were completed during the year. These films dealt with forest protection ("Havoc," 500 feet), reforestation ("Planting Prosperity," 800 feet), and the forest industries ("Timber-r-r," 800 feet), and have proven worth-while additions to the Division library. All but the final sounding has been completed on a film on the Christmas-tree industry ("Santa's Foresters," 800 feet).

At the request of the Topographic Survey Division, Lands Service, the Division photographer accompanied a survey party into Northern British Columbia in the vicinity of Bowser Lake. This resulted in the production of a colour film of 1,200 feet entitled "Flying Surveyors," which was ready for sounding and final editing by the end of the year.

The photographer continued to obtain footage in colour for producing educational films on water power and erosion, the activities of the Forest Service, care and protection of fire-fighting equipment, a special project for the Economics Division (Research) recording in continuous motion the growth of a fir-cone from the bud stage, and proper range management. In this connection a total of some 3,200 feet of film was recorded on these subjects.

In carrying out his work during the year, the photographer travelled 12,500 miles by car, 1,800 miles by commercial air lines, 2,200 miles by boat, and 130 miles by helicopter, for a total of 16,300 miles.

Film Library

With the removal of six obsolete subjects which were felt to be detrimental to the standing of the library, and the addition of nine new sound films, seven of which were in colour, the motion-picture library ended the calendar year with a stock of seventy-eight subjects.

As in the past, a considerable number of films dealing with forestry and allied sciences, and produced by outside commercial agencies, were previewed by members of the Division with a view to purchase. The standard of such educational films is being constantly improved, thus making it possible to purchase several suitable subjects for the library.

The trend on the part of the public away from silent films continued to be evident during the year, with circulation on silent subjects below that of the previous year. However, the addition of the new up-to-date productions toward the end of the year saved the library from losing many of its contacts, although the number of individual films loaned was off 2 per cent from the previous year and 10 per cent in the last two years.

The number of loans was up to 416, an increase of 19 over the previous year, an indication that the actual use of the library is not falling off. The number of showings was up to a record high of 1,880, an increase of 375 showings over the previous year. This increase was primarily accounted for by the showings given on the school-lecture tour.

The total audience for the year reached a new record of 165,372 persons, of whom 26,988 were adults, 95,102 children, and 43,282 not classified. Of the 95,102 children viewing the films, 39,633 were reached by the two members of the Division's school-lecture tour team. This brings the cumulative total audience for the years 1945 to 1950, inclusive, to 494,597, with an average audience of 84 persons.

A total of 163 showings to 15,300 persons was given by headquarters and district personnel of the Service. The Fort George Forest District again registered the largest audience of any district with a total of 4,884, while Nelson led in the number of individual showings with 33.

The most widely seen of the educational films were " Adventures of Junior Raindrop " (shown 132 times to 12,905 persons), " Garibaldi Park " (62 times to 10,460 persons), and " Tweedsmuir Park " (76 times to 9,029 persons).

Certain American universities continued to utilize the services of our film library, and the office of the United States Forest Service at Columbus, Ohio, borrowed films for the first time.

During the year the Division's motion-picture projection equipment was borrowed forty-two times by members of other divisions. The two slide projectors were borrowed a total of twenty-seven times. A tabular statement of the stock and circulation of the film library appears on page 132 of the Report.

EXHIBITS

The Division concentrated its efforts on three large exhibitions instead of the several small fall fairs, as had been the policy in the past. In co-operation with the Canadian

Forestry Association (British Columbia Branch) a large commercially built display was entered in the North Vancouver Exhibition and later in the Pacific National Exhibition in Vancouver and the Modern Home Exhibition at New Westminster. At these locations the display caused interest and favourable comment. Due to the Division's lack of storage-space, the exhibit has been left with the Canadian Forestry Association pending further use. The portable fire-detection display was pressed into service for its third year; this time at the Comox Agricultural and Industrial Fall Fair, Courtenay. A special small display featuring a selection of Forest Service pumps and technical equipment of interest to the public was arranged for the View Royal Community Fair near Victoria. In all cases where exhibits were shown, a member of the Division was in attendance.

SIGNS AND POSTERS

Due to lack of the necessary working-space, it was not possible for members of the staff to continue with the construction of the large forest-protection Scotchlite highway-signs. Therefore, an order was placed with a commercial company to make up a total of twenty-five of these signs, using the material previously assembled for that purpose by the Division. This work was completed satisfactorily late in the summer, and five signs were shipped to each district. Each forest district now has ten of these large reflecting-signs for use during the fire season on the main routes of travel within their boundaries.

Special forest-protection highway-signs were designed by the Division for erection on the Hope–Princeton Highway at the entrance to Manning Park. These signs were most successful and caused favourable comment on the part of the travelling public and in the press.

The production of standardized directional signs was impossible during the year because of lack of working-space. In December the Forest Service Marine Station indicated that it was able to initiate the construction of fifty of the Ranger-station signs. By the end of the year, sufficient material had been ordered by the Division and delivered to the Marine Station to permit a start to be made on these signs.

During the year the Division designed and distributed eight new coloured forest- and range-protection posters of various sizes and shapes. A stock in eleven poster designs is now available for display during the fire season.

MISCELLANEOUS MEDIA

An oval-shaped coloured decalcomania transfer with a forest-protection message and design was produced by the Division for use on automobile windshields during fire seasons. Ten thousand copies were secured from a commercial company for distribution prior to the 1951 fire season.

For the first time the Division utilized the publicity medium of the smaller independent motion-picture theatres throughout the Province with a forest-protection stereopticon slide. This slide was shown on alternate nights during the months of June, July, and August in fourteen theatres to an estimated audience of some 60,000 persons. The slide was an original design produced by the Division.

CO-OPERATION

During the months of July and August the Division arranged for an educational tour through certain Forest Service installations for members of the junior forest-warden movement encamped at Port Atkinson, Burrard Inlet. Altogether, some 200 junior wardens were conducted through the Green Timbers Nursery, Ranger School, Forest Service Marine Station, and Forest Service Radio Station XL442, Vancouver. Four tours were made, each with approximately fifty wardens in attendance. The forester in charge of the division or his assistant supervised each of the tours and spoke to the group on each occasion. The willing co-operation on the part of the four installations visited

is deeply appreciated by the Division and accounted in no small measure for the success of the project.

A total of 837 honorary fire wardens was appointed by the districts during the year. To each appointee went a letter of appreciation over the Minister's signature and a year's subscription to the conservation magazine " Forest and Outdoors."

The Division co-operated closely with the Parks and Recreation Division in making arrangements for and organizing two special events during the year—the opening of Pine Woods Lodge, Manning Park, and Mount Seymour Park Road.

Another special project was carried out in conjunction with the Reforestation Division and the Vancouver Forest District when members of the press were taken on an extensive tour of the planting areas on Vancouver Island. This resulted in many fine factually sound articles in the press on the reforestation and forest-protection activities of the Service.

Frequent aid in material, suggestions, and assistance in editing manuscripts was rendered a number of individuals preparing forestry or forest-industry articles for publication.

Shortly after the public-school term commenced in the fall, the Division, with the endorsation of the Department of Education and the co-operation of the Canadian Forestry Association (British Columbia Branch), launched a motion picture-lecture tour through the elementary, junior high, and superior schools of the Province. The Division put two lecturers in the field, and the Canadian Forestry Association one. By the year's end all schools in these classes on Vancouver Island, and some schools on the Southern Mainland Coast, had been visited by one of the two lecturers operating in the Vancouver Forest District. The second Forest Service lecturer toured the Kamloops Forest District and had made good progress by the year's end.

During the initial three-month period, from approximately October 15th to December 15th, 148 lectures were given by the three lecturers and a total school attendance of 17,706 was recorded. In addition, some 30 special showings (other than to school-children) were presented to audiences totalling 1,655.

The talks and films have aroused widespread interest amongst both teachers and students in the problems of forest management and conservation. The films shown have also stimulated requests for further visual aids, while the inquiries for pamphlets have almost exhausted the available supply.

In order to embark on this worth-while project, it was necessary for the Division to add two lecturers to its personnel. One of these, a senior Ranger of long service, was transferred to the Division on a permanent basis, while the other lecturer was added from outside the Service on a temporary basis.

Manuscripts for a series of " Conservation Topics " for distribution to the schools, as follow-ups to the lectures, were at hand and in the process of editing by the end of the year. The Division is indebted to members of the Economics Division (Research), the Parks and Recreation Division, and the Forest Insect and Forest Diseases Investigation Services, Dominion Department of Agriculture, for preparing the originals of these manuscripts.

LIBRARY

The library continued to operate at a high level of activity, with a very noticeable increase in the number of requests for loans and information on a wide variety of forestry and allied subjects. A large number of special publications covering a broad field of activities was ordered for members of the Service.

Owing primarily to lack of space, the library is not yet able to provide completely the service for which it was designed. The ever-increasing number of photographic file-cabinets and Kodachrome-slide files continues to tax the limited facilities available. The almost constant traffic through the library in connection with photographic matters, unfortunately, makes it impossible to maintain an atmosphere conducive to reading or serious study.

GRAZING

INTRODUCTION

The grass-land and forest ranges of this Province are a valuable resource which, if properly managed, can continue to make large annual contributions to the Provincial economy in perpetuity. They will supply forage for live stock, serve as important recreational areas, and be suitable as a home for game without any reduction in their value as watershed areas. If mismanaged and allowed to deteriorate, returns in the form of meat and wool will diminish and other values will be damaged.

A very large percentage of the range land in this Province remains as Crown land, and the live-stock industry is largely dependent on the Crown range for summer forage. The allocation and preservation of this range is the responsibility of the Forest Service and, through close co-operation with and by the stockmen, continued progress toward improved range-management practices was made during 1950.

ADMINISTRATION

In view of the necessity of maintaining the closest possible contact with the ranching industry, grazing administration is decentralized to the fullest extent practical. The bulk of administrative work is carried out under the direction of the District Forester concerned. Specialized personnel are employed to handle this phase of forest administration at the district-office level, and a fair share of the time of the Ranger staff is also devoted to range administration.

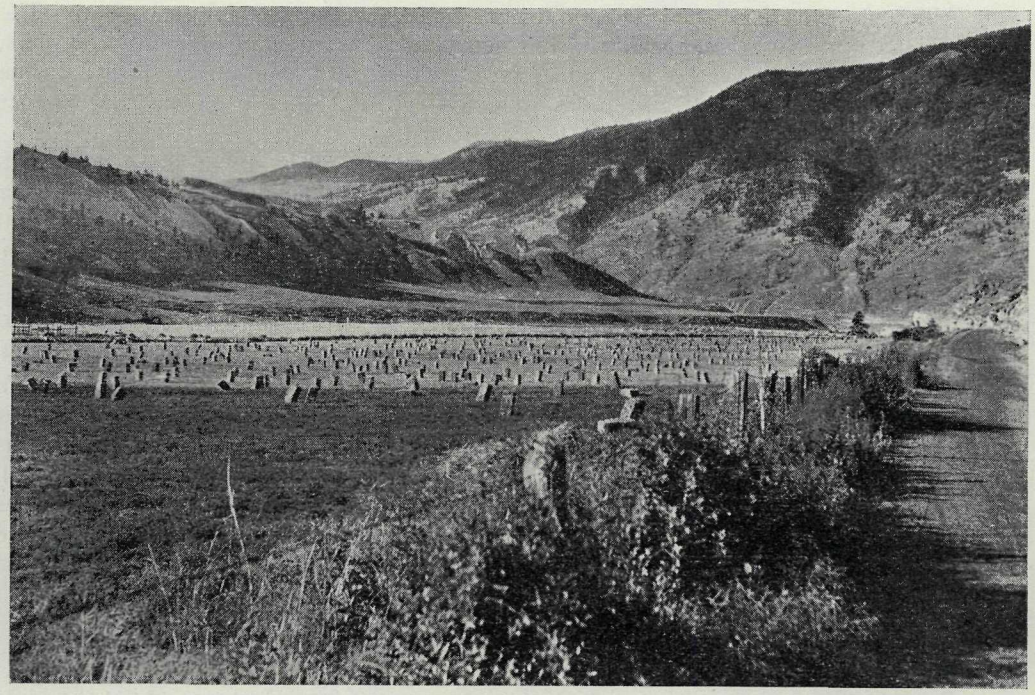
During 1950 the volume of routine administrative work was particularly heavy. This was due to numerous factors, including more intensive range management, an increase in grazing fees, and an intensified range-improvement programme. Numerous changes in ranch ownership, resulting in the necessity of reallocating grazing privileges, meant additional work. Land applications, which must be checked carefully to determine their effect on the use of Crown range, were numerous. A considerable amount of effort was also expended in improving and clarifying grazing-permit area descriptions.

Early in the year the Grazing Regulations were revised and consolidated. The only innovation of importance concerned grazing fees, which were placed on a sliding scale. The fees which had been in effect since 1919 are now used as base fees and are related to average live-stock prices for 1939. The actual fees charged each year are in the same ratio to the base fees as average prices for the immediately preceding year are to average prices for 1939. On this basis, grazing fees charged in 1950 were 16 cents per head per month for cattle, 20 cents per head per month for horses, and 3¼ cents per head per month for sheep.

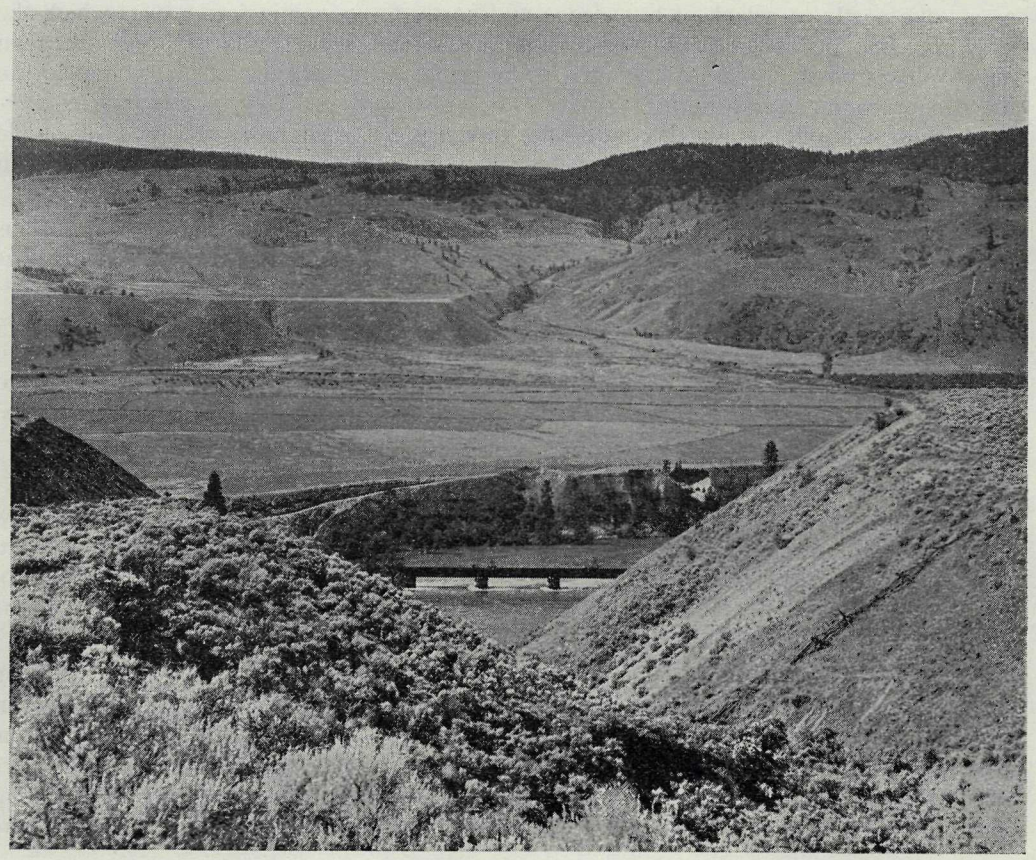
GENERAL CONDITIONS

The winter of 1949–50 was extremely cold, a condition detrimental to live stock. However, in most areas there was an adequate supply of hay, and over-all losses were not much above average. In a few cases, where inadequate hay was provided or where stockmen had relied too greatly on winter range, losses were severe. On the average, stock were in somewhat poorer condition than desirable when turned out on the range.

The advent of spring weather was late and, throughout the range area, forage growth was very slow. Turnout on the spring ranges was delayed as long as possible, but in many areas it became necessary to allow grazing before the range was properly ready for use. With the exception of the East Kootenay Valley and the easterly portion of the Boundary country, subsequent summer heat and dry conditions prevented a good recovery on the grass-land ranges. The volume of fall forage was, therefore, below average and, even in the East Kootenay Valley, late summer drought had a detrimental effect.



Baled hay for winter feed, Thompson River valley.



Association of summer range, spring-fall range, and agricultural land for winter feed.

Although growth started late, summer range conditions were excellent. The adequate moisture reserves, resulting from heavy winter snow and previous wet years, combined with the hot weather to produce large quantities of good-quality forage on the forest ranges. Alpine range conditions were also good. Stock came off the summer range in better condition than average.

Owing to the generally poor condition of the fall ranges and a sharp cold spell accompanied by snow in the early part of November, winter feeding commenced earlier than usual in many areas. However, the cold weather did not persist and, as the 1950 hay-harvest was good both as to quantity and quality throughout most of the range country, it is expected that stock will come through the winter in good condition.

Grasshoppers were not a particularly damaging factor to the range this year, although there are some indications that the grasshopper cycle is again on the up-swing.

Materials and equipment were in good supply during 1950 and, for the first time since 1941, an adequate supply of good-quality barbed wire was obtained for use in our range-improvement programme. Although the ranch and range labour situation has improved somewhat, costs are up very considerably and the turnover of labour is still abnormally large. In spite of high ranch wages, labourers are attracted by the amenities of the town. As stock-handling requires considerable skill and experience, and as time is required for a rider to become familiar with an extensive range, a stable labour force is essential to good range management.

RANGE MANAGEMENT

Proper management is necessary to obtain maximum forage returns and at the same time prevent deterioration of the range resource. Range depletion has occurred in some areas, due partly to a lack of knowledge and partly to economic forces over which the stockman had no control. A particular effort is now being made to bring about an improvement on these depleted ranges. The principal malpractices to be remedied are too early turnout, overstocking, and poor stock distribution. Time is required to overcome these without unduly disrupting the industry. Considerable progress was made during 1950, with the co-operation of the range-users concerned. Further progress can be expected as the stockmen become aware of the benefits deriving therefrom.

During the year, emphasis was placed on developing improved management plans for ranges recently covered by range surveys. Implementation of these plans was commenced and will continue progressively.

Several alpine ranges which were formerly grazed by sheep are now being used by cattle, as the ranches concerned have converted to the latter class of stock. In spite of weeds comprising a high percentage of the forage, the cattle, particularly cows and calves, have done surprisingly well. Cattlemen are now showing a marked interest in the use of alpine ranges.

CO-OPERATION

There are now forty-four active live-stock associations in the Province. Three new associations were formed during the year and one was disbanded owing to changed conditions and a lack of interest. One hundred and twelve meetings were reported, of which ninety-two were attended by forest officers. The associations continued to be of valuable assistance in all phases of range administration.

During the year several trial range-improvement projects were carried out in co-operation with the Dominion Range Experiment Station. Excellent response was also received from the Station in connection with plant identification and technical problems which were referred to it for study and advice. Several range inspections were carried out in company with Game Department officials to study game-livestock relationships. Close co-operation with the Live Stock Branch of the Department of Agriculture

continued throughout the year in connection with the bull-control and disease-free areas being established in the range country. Close contact with the various Indian Agents was maintained with reference to the use of Crown range by Indians.

RANGE IMPROVEMENT

With increased funds and more material available, the range-improvement programme was stepped up in 1950, with the following projects being completed: Stock-bridges, 2; cattle-guards, 8; drift-fences, 16; experimental plots, 4; holding-grounds (repaired), 5; mudhole fences, 2; range seedings, 2; stock-trails, 7; water-developments, 3; weed-control measures, 1. In addition, stockmen were authorized to construct, at their own expense, the following secondary improvements: Breeding pastures, 1; corrals, 1; drift-fences, 2; grazing enclosures, 1.

Further action was taken to keep the ranges clear of wild and useless horses. On the recommendation of associations and stockmen, fifty horse-roundup permits and fifty-two horse-shooting licences were issued. Seventy-nine horses were rounded up and shipped for slaughter and 674 were shot.

The range seedings carried out to date have been on a pilot basis only, owing to the high cost of seed and a lack of information as to the best methods of seeding. However, on the basis of experience gained, it is felt more of this work should be undertaken. In anticipation of an increase in activity along this line, a quantity of crested wheat-grass seed was obtained late in the year when prices were the most favourable in years. Also a plot 22 acres in extent in the vicinity of Kamloops was seeded to crested wheat-grass, from which seed may be harvested in the event of a recurring shortage of this seed.

The experimental plots listed above were established to study the effect of fire on range, the response of depleted range to complete protection, response of dry grass-land range to fertilizer applications, and the adaptability of various grass species for use on dry range in the Grand Forks area.

The weed-control measure listed is a continuation of the goatweed project commenced in 1949. It is now evident that complete eradication of this pest from the range area is impractical. Efforts in 1950 were directed toward reducing the spread of the weed. Weed-patches isolated from the main areas of infestation and along roads or in other strategic locations were treated. In all, a net area of 80 acres was treated.

Early in the year a meeting between forest officers and a committee of the British Columbia Beef Cattle Growers' Association was held to discuss range improvements generally and in particular the type of projects which should be given preference in the utilization of any additional funds available as a result of the increase in grazing fees.

RANGE RECONNAISSANCE

The range-reconnaissance programme was reduced somewhat in 1950, with the following areas being covered:—

	Acres
Nicola Stock Range (Maka Creek unit)	51,680
Ashcroft Stock Range (north-west portion)	417,792
Grand Forks-Greenwood Riding Stock Ranges	92,000
	561,472

In addition, eleven range examinations were carried out, in the course of which old range-surveys were checked and, where necessary, the maps revised or extended.

GRAZING, HAY, AND SPECIAL-USE PERMITS

Grazing permits issued in 1950 were approximately the same in number as in 1949. The number of stock covered was down somewhat owing to continued heavy sales

resulting from high prices. The tabulation on page 133 shows the volume of business for 1950 and the past ten years.

Grazing fees billed and collected in 1950 were much higher than in previous years, and are shown in the tabulation on page 133. The marked increase in fees was due to the revision of the grazing regulations referred to earlier.

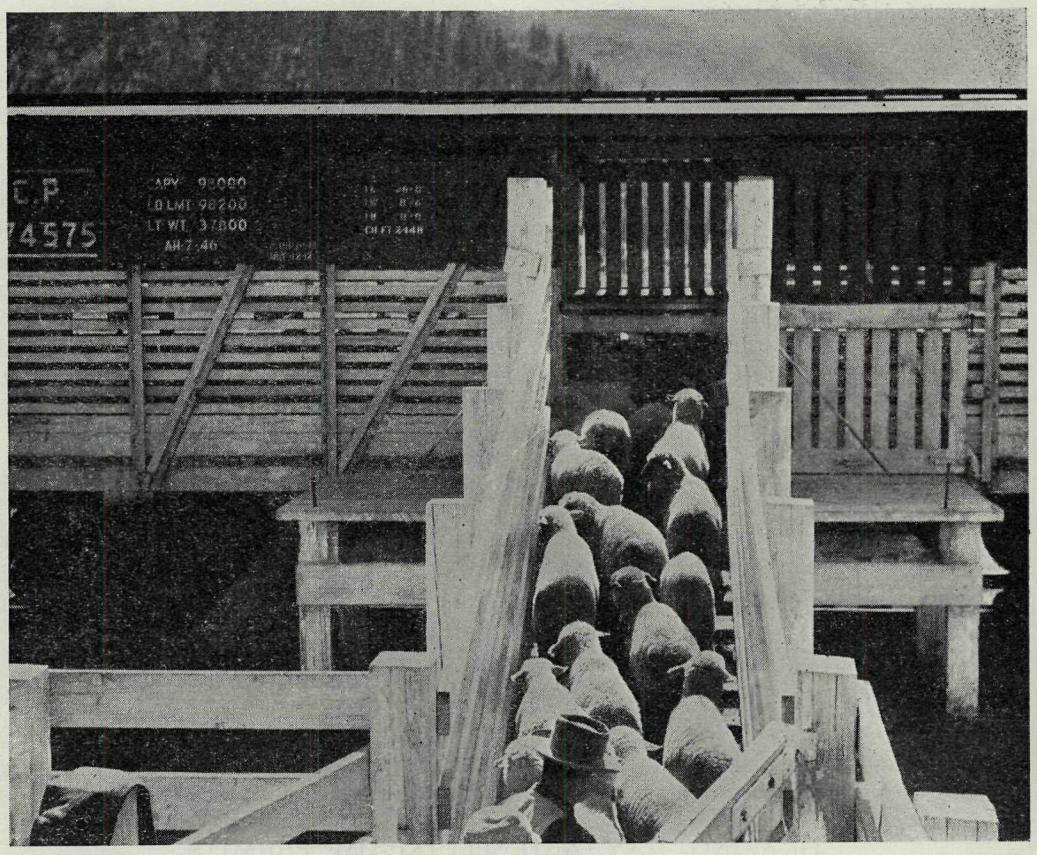
Twenty-three special-use permits authorizing the fencing of pastures for special purposes in Provincial forests were issued in 1950.

One hundred and sixty-two hay-cutting permits authorizing the cutting of 1,942 tons of hay and 84 tons of rushes on Crown range were issued. This is a considerable decrease from 1949.

MISCELLANEOUS

Live-stock Losses

Losses of stock on the range appeared to be somewhat heavier this year. Poisonous weeds continued to be a problem, with timber milk-vetch being particularly bad. Owing to the dry summer, water-levels in lakes dropped lower than for several years, and reports of mired animals were more frequent. Losses to predatory animals were reported less than during the last few years. Highway traffic is responsible for an increasing number of stock-losses. Some animals are reported to have died from gunshot wounds during the hunting season.



Loading sheep, Elko.

Markets and Prices

Demand still far exceeds the supply of meat and wool on the markets available to British Columbia stockmen. As a result, prices advanced as much as 40 per cent during the year. Shipments of cattle were about the same as in 1949, with sheep and lambs being up about 10 per cent. There were six major range-livestock shows and sales in 1950.

Prosecutions

No prosecutions were instituted in 1950 under the " Grazing Act " and regulations. As usual, a number of acts of trespass took place, but in all instances the stockmen concerned complied with our written instructions to rectify the situation.

Plant Collections

Plant identification is essential as a basis for range management. To aid in this, collections of mounted specimens of the important range plants are being built up in the district offices. This work continued during 1950 and, in addition, the Grazing Division supplied the Ranger School with the nucleus of a grazing herbarium for use in connection with the course in grazing.

PERSONNEL DIRECTORY, 1951

VICTORIA OFFICE

C. D. Orchard	Deputy Minister and Chief Forester	Victoria.
R. C. St. Clair	Assistant Chief Forester.	
C. Cooper	Forest Counsel.	
R. G. McKee	Forester i/c Operation Division	Victoria.
P. Young	Assistant Forester.	
A. H. Dixon	Assistant Forester.	
D. W. Perrie	Meteorologist.	
P. H. Bodman	Forester-in-training.	
R. T. Flanagan	Forester-in-training.	
E. A. Moyes	Forester-in-training.	
W. C. Spouse	Mechanical Superintendent.	
A. B. Crowe	Assistant Mechanical Superintendent.	
J. H. Taylor	Superintendent of Construction.	
G. A. Playfair	Radio Superintendent.	
H. E. Ferguson	Assistant Radio Superintendent.	
R. L. Fielder	Technical Forest Assistant (Fire Research).	
L. Lucas	Technical Forest Assistant (Fire Research).	
A. Stringer	Chief Clerk.	
F. S. McKinnon	Forester i/c Management Division	Victoria.
S. E. Marling	Forester.	
G. M. Abernethy	Assistant Forester.	
J. S. Stokes	Assistant Forester.	
A. E. Collins	Assistant Forester (Forest-cover Maps).	
W. G. Hughes	Assistant Forester (Management Licences).	
D. M. Carey	Assistant Forester (Public Working-circles).	
D. M. Trew	Assistant Forester (Farm-woodlot Licences).	
F. F. Slaney	Engineer.	
R. G. Gilchrist	Chief Draughtsman.	
E. H. Henshall	Chief Clerk.	
A. Chisholm	Chief Clerk (Timber-sale Administration).	
H. Casilio	Senior Clerk (Timber-sale Contracts).	
H. G. McWilliams	Forester i/c Reforestation Division	Victoria.
A. H. Bamford	Assistant Forester.	
E. G. Whiting	Assistant Forester.	
W. D. Grainger	Forester-in-training.	
T. Wells	Nursery Superintendent (New Westminster).	
J. R. Long	Nursery Superintendent (Duncan).	
W. Turner	Nursery Superintendent (Campbell River).	
N. G. Wharf	Clerk.	
E. G. Oldham	Forester i/c Parks and Recreation Division	Victoria.
C. P. Lyons	Assistant Forester.	
L. Brooks	Forester-in-training.	
R. H. Ahrens	Forester-in-training.	
R. Lowrey	Forester-in-training.	
W. E. Rolls	Forester-in-training.	
G. F. Macnab	Forester-in-training.	
D. L. Macmurchie	Technical Forest Assistant.	
N. M. F. Pope	Technical Forest Assistant.	
G. A. Wood	Technical Forest Assistant (Geographer).	
R. Y. Edwards	Assistant Biologist.	
E. A. McGowan	Engineer-in-training.	
C. J. Velay	Engineer-in-training.	
J. M. Bailey	Engineer-in-training.	
R. Stewart	Architectural Draughtsman.	
S. E. Park	Senior Clerk (Administration).	
E. Charlton	Senior Clerk (Accounts).	

VICTORIA OFFICE—*Continued*

E. Druce	Forester i/c Public Relations and Education Division	Victoria.
D. R. Monk	Public Relations Officer (Administration).	
P. W. H. G. Johnson	Public Relations Officer (Photography).	
W. N. Campbell	Technical Forest Assistant	
Miss I. Chisholm	Forest Service Library.	
R. H. Spilsbury	Forester i/c Research Division	Victoria.
E. H. Garman	Assistant Forester (Silviculture).	
A. R. Fraser	Assistant Forester (Mensuration).	
L. A. deGrace	Assistant Forester (Aleza Lake Experimental Station).	
A. L. Orr-Ewing	Assistant Forester (Silviculture).	
G. C. Warrack	Assistant Forester (Silviculture).	
H. C. Joergensen	Assistant Forester.	
J. M. Finnis	Forester-in-training.	
R. L. Schmidt	Forester-in-training.	
M. B. Clark	Forester-in-training.	
T. P. Decie	Forester-in-training.	
H. A. W. Knight	Agrologist-in-training.	
E. A. Roberts	Foreman (Cowichan Lake Experimental Station).	
H. M. Pogue	Forester i/c Forest Surveys and Inventory Division	Victoria.
G. Silburn	Assistant Forester.	
H. N. Cliff	Assistant Forester.	
G. W. Allison	Assistant Forester.	
W. Bradshaw	Forester-in-training.	
R. Breadon	Forester-in-training.	
C. J. Calder	Forester-in-training.	
R. Darnall	Forester-in-training.	
D. M. Fligg	Forester-in-training.	
B. Ford	Forester-in-training.	
J. H. Frey	Forester-in-training.	
C. J. Highsted	Forester-in-training.	
R. C. Jones	Forester-in-training.	
E. H. Lyons	Forester-in-training.	
E. G. Vaughan	Forester-in-training.	
W. Young	Forester-in-training.	
C. J. T. Rhodes	Supervising Draughtsman.	
D. Macdougall	Technical Forest Assistant.	
W. C. Pendray	Forest Agrologist i/c Grazing Division	Victoria.
W. V. Hicks	Inspector, Forest Accounts	Victoria.
D. I. MacLeod	Assistant Inspector.	
W. C. Higgins	Chief Accountant.	
A. E. Rhodes	Assistant Accountant.	
J. R. L. Conn	Clerk, Expenditures.	
E. Clough	Overrun Investigator.	
R. D. Greggor	Forester i/c Ranger School	New Westminster.
J. A. Pedley	Assistant Forester.	
G. L. Levy	Clerk.	
J. G. MacDonald	Superintendent, Forest Service Marine Station	Vancouver.

VANCOUVER FOREST DISTRICT

E. W. Bassett	District Forester	Vancouver.
D. B. Taylor	Assistant District Forester.	
D. H. Ross	Assistant Forester (Operation).	
J. A. K. Reid	Assistant Forester (Management).	
C. F. Holmes	Assistant Forester (Slash-disposal Officer).	
C. E. Bennett	Assistant Forester.	
G. R. Johnston	Forester-in-training.	
W. B. Gayle	Forester-in-training.	
F. S. Williams	Forester-in-training.	

VANCOUVER FOREST DISTRICT—*Continued*

T. R. Hubbard	Forester-in-training.
J. McNeill	Supervisor.
R. H. Morrison	Supervisor.
C. S. Frampton	Supervisor.
P. R. Neil	Technical Forest Assistant.
H. H. Hill	Mechanical Inspector.
C. L. Armstrong	Supervisor of Scalers.
A. C. Heard	Assistant Supervisor of Scalers.
H. A. D. Munn	Assistant Supervisor of Scalers.
J. A. Fetherstonhaugh	Inspector of Licensed Scalers.
J. H. Templeman	Inspector of Licensed Scalers.
E. P. Fox	Chief Clerk.
G. Birkenhead	Supervising Draughtsman.
F. Goertzen	Radio Technician.

R.D. No.			
1.	H. Stevenson	Ranger	Chilliwack.
2.	J. H. Robinson	Ranger	Mission.
3.	G. G. Armytage	Ranger	North Vancouver.
4.	S. C. Frost	Ranger	Squamish.
5.	L. C. Chamberlin	Ranger	Sechelt.
6.	D. H. Owen	Ranger	Madeira Park.
7.	W. Black	Ranger	Powell River.
8.	R. W. Aylett	Ranger	Lund.
9.	A. F. W. Ginnever	Ranger	Thurston Bay.
10.	K. A. McKenzie	Ranger	Thurston Bay.
11.	W. P. Rawlins	Ranger	Alert Bay.
12.	R. W. Jones	Ranger	Port Hardy.
13.	C. D. S. Haddon	Ranger	Campbell River.
14.	S. Silke	Ranger	Courtenay.
15.	W. E. Jansen	Ranger	Nanaimo.
16.	P. Sweatman	Ranger	Duncan.
17.	J. P. Greenhouse	Ranger	Langford.
18.	F. Tannock	Ranger	Alberni.
19.	C. J. Wagner	Ranger	Zeballos.
20.	H. Barker	Ranger	Cowichan Lake.
21.	R. Little	Ranger	Harrison Lake.
22.	R. J. Glassford	Ranger	Parksville.
23.	M. H. Mudge	Ranger	Alert Bay.

PRINCE RUPERT FOREST DISTRICT

M. W. Gormely	District Forester	Prince Rupert.
M. O. Kullander	Assistant District Forester.	
J. P. MacDonald	Assistant Forester (Operation).	
L. B. B. Boulton	Assistant Forester (Silviculture).	
J. B. Bruce	Assistant Forester (Management).	
R. W. Corregan	Forester-in-training (Management).	
D. R. Selkirk	Forester-in-training (Management).	
J. R. Gilmour	Forester-in-training (Silviculture).	
W. H. Hepper	Recreational Officer.	
J. B. Scott	Inspector of Licensed Scalers.	
S. G. Cooper	Inspector of Licensed Scalers	Terrace.
H. L. Couling	Supervisor.	
C. Dahlie	Technical Forest Assistant (Crew Supervisor)	Smithers.
C. V. Smith	Chief Clerk.	
J. W. Eastwood	Assistant Chief Clerk.	
I. Martin	Senior Draughtsman.	

R.D. No.			
1.	C. L. Gibson	Ranger	Burns Lake.
1.	R. L. Brooks	Ranger	Burns Lake.
2.	L. G. Taft	Ranger	Hazelton.
3.	D. R. Smith	Ranger	Terrace.

PRINCE RUPERT FOREST DISTRICT—*Continued*

R.D. No.			
3.	W. H. Campbell	Acting Ranger	Terrace.
4/7.	S. T. Strimbold	Ranger	Prince Rupert.
4.	R. G. Benson	Ranger	Atlin.
5/6.	H. B. Hammer	Ranger	Queen Charlotte City.
8.	H. G. Bancroft	Forester-in-training	Ocean Falls.
9.	W. A. Antilla	Ranger	Southbank.
9.	P. J. Piche	Ranger	Southbank.
10.	J. A. Willan	Ranger	Smithers.
11.	J. F. Munro	Ranger	Houston.
12.	A. A. Antilla	Ranger	Pendleton Bay.
13.	J. Mould	Ranger	Kitwanga.

FORT GEORGE FOREST DISTRICT

L. F. Swannell	District Forester	Prince George.
W. G. Henning	Assistant District Forester.	
E. W. Robinson	Assistant Forester (Management).	
F. Hollinger	Mechanical Inspector.	
I. R. Burrows	Forester-in-training (Management).	
G. M. Shires	Forester-in-training (Operation).	
D. R. Glew	Forester-in-training (Silviculture).	
F. H. Nelson	Supervisor.	
L. A. Willington	Fire Inspector.	
A. H. McCabe	Inspector of Licensed Scalers.	
R. B. Carter	Chief Clerk.	

R.D. No.			
1.	J. S. Macalister	Ranger	McBride.
2.	R. Mackenzie	Acting Ranger	Penny.
3.	A. F. Specht	Ranger	Prince George (S.E.).
4.	C. L. French	Ranger	Prince George (N.).
5.	A. V. O'Meara	Ranger	Fort St. James.
6.	G. G. Jones	Ranger	Quesnel (E.).
7.	H. T. Barbour	Ranger	Pouce Coupe.
8.	M. F. Painter	Ranger	Aleza Lake.
9.	N. Threatful	Ranger	Vanderhoof.
10.	J. Woolsey	Ranger	Fort St. John.
11.	R. I. Patterson	Ranger	Fort Fraser.
12.	R. B. Angly	Ranger	Fort McLeod.
13.	G. E. Meents	Ranger	Quesnel (W.).
14.	W. H. Mulholland	Forester-in-training	Prince George (W.).

KAMLOOPS FOREST DISTRICT

A. E. Parlow	District Forester	Kamloops.
W. C. Phillips	Assistant District Forester.	
W. W. Stevens	Assistant Forester (Management).	
J. R. Johnston	Assistant Forester (Operation).	
J. C. Payne	Assistant Forester (Management).	
C. D. Grove-White	Assistant Forester (Silviculture).	
N. A. McRae	Forester-in-training (Management).	
M. L. Kerr	Forester-in-training (Management).	
L. W. Lehrle	Forester-in-training (Silviculture).	
T. R. Broadland	Recreational Officer.	
H. K. DeBeck	Assistant Forest Agrologist.	
M. T. Wallace	Assistant Forest Agrologist.	
A. Paulsen	Assistant Forest Agrologist.	
R. O. Pringle	Assistant Forest Agrologist.	
B. E. Neighbor	Forester-in-training (Grazing).	
A. J. Kirk	Fire Inspector.	
H. S. Noakes	Fire Inspector.	
J. H. Smythe	Mechanical Inspector.	
E. A. Charlesworth	Inspector of Licensed Scalers.	

KAMLOOPS FOREST DISTRICT—*Continued*

C. Williams	Inspector of Licensed Scalers.
W. P. Cowan	Technical Forest Assistant.
C. R. Downing	Technical Forest Assistant.
C. H. Huffman	Technical Forest Assistant.
G. F. Bodman	Technical Forest Assistant.
E. A. Bowers	Radio Technician.
H. J. Parker	Chief Clerk.

R.D. No.			
1.	M. A. Johnson	Ranger	Vernon.
2.	H. W. Campbell	Ranger	Birch Island.
3.	D. P. Fraser	Ranger	Barriere.
4.	H. A. Ferguson	Ranger	Kamloops.
5.	H. G. Mayson	Ranger	Chase.
6.	J. Boydell	Ranger	Salmon Arm.
7.	J. A. Sim	Ranger	Sicamous.
8.	E. L. Scott	Ranger	Revelstoke.
9.	J. W. Hayhurst	Ranger	Vernon.
10.	C. Perrin	Ranger	Penticton.
11.	J. H. Dearing	Ranger	Princeton.
12.	C. E. Robertson	Ranger	Clinton.
13.	K. N. Petersen	Ranger	Williams Lake.
14.	T. L. Gibbs	Ranger	Alexis Creek.
15.	R. B. W. Eden	Ranger	Kelowna.
16.	L. E. Cook	Ranger	Wells Gray Park.
17.	R. C. Hewlett	Ranger	Merritt.
18.	A. C. Schutz	Forester-in-training	Blue River.
19.	H. C. Hewlett	Ranger	Enderby.
20.	R. H. Boyd	Ranger	Manning Park.
21.	O. Paquette	Ranger	100-Mile House.

NELSON FOREST DISTRICT

H. B. Forse	District Forester	Nelson.
I. T. Cameron	Assistant District Forester.	
L. S. Hope	Forester (Silviculture).	
W. E. Young	Assistant Forester (Management).	
J. E. Milroy	Assistant Forest Agrologist.	
E. Knight	Forester-in-training.	
J. G. Hall	Forester-in-training.	
W. G. Bishop	Forester-in-training.	
E. R. Smith	Forest Agrologist-in-training.	
R. G. Gill	Technical Forest Assistant.	
J. H. A. Applewhaite	Technical Forest Assistant.	
G. Lepsoe	Technical Forest Assistant.	
R. H. Baker	Mechanical Inspector.	
G. T. Robinson	Inspector of Licensed Scalers.	
J. H. Holmberg	Supervisor.	
I. B. Johnson	Supervisor.	
L. A. Chase	Supervisor.	
R. O. Christie	Supervisor.	
G. C. Palethorpe	Supervisor.	
J. C. I. Rogers	Supervising Draughtsman.	
L. S. Ott	Radio Technician.	
S. S. Simpson	Chief Clerk.	

R.D. No.			
1.	C. R. Tippie	Ranger	Invermere.
2.	R. A. Damstrom	Ranger	Fernie.
3.	H. J. Coles	Ranger	Golden.
4.	F. R. Hill	Ranger	Cranbrook.
5.	A. I. Ross	Ranger	Creston.
6.	J. L. Humphrey	Ranger	Kaslo.
7.	A. J. Larsen	Acting Ranger	Lardo.

NELSON FOREST DISTRICT—*Continued*

R.D. No.			
8.	L. M. Quance	Ranger	Nelson.
9.	R. E. Robinson	Ranger	New Denver.
10.	H. R. Wood	Ranger	Nakusp.
11.	J. F. Killough	Ranger	Rossland.
12.	E. W. Reid	Ranger	Grand Forks.
12.	M. G. Isenor	Ranger	Grand Forks.
13.	L. E. Stilwell	Ranger	Kettle Valley.
13.	J. E. Connolly	Ranger	Kettle Valley.
14.	C. J. McGuire	Ranger	Canal Flats.
15.	J. B. Gierl	Ranger	Arrowhead.
16.	W. D. Haggart	Ranger	Edgewood.
17.	F. G. Hesketh	Ranger	Elko.

APPENDIX

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(1)

DISTRIBUTION OF PERSONNEL, 1950

Personnel	Forest District						Total
	Vancouver	Prince Rupert	Fort George	Kamloops	Nelson	Victoria	
Continuously Employed							
Chief Forester, Assistant Chief Forester, and Division Foresters	----	----	----	----	----	9	9
District Foresters and Assistant District Foresters	2	2	2	2	2	----	10
Foresters and Assistant Foresters	5	3	2	4	2	31	47
Agrologists and Assistants	----	----	----	4	2	1	7
Foresters-in-training	3	3	4	5	3	27	45
Supervisor of Rangers and Fire Inspectors	3	----	1	1	4	----	9
Rangers	24	12	15	26	21	1	99
Supervisor of Scalers and Assistants	5	1	1	2	1	----	10
Scalers, Official	68	----	----	----	----	----	68
Scalers, Licensed	----	----	----	1	----	----	1
Inspectors, Royalty and Export	1	----	----	----	----	3	4
Mechanical—Radio and Engineering Supervisors	3	2	2	2	3	8	20
Technical Forest and Public Relations Assistants	1	2	----	4	2	15	24
Nursery, Reforestation, Parks, and Research Assistants	----	----	----	----	----	16	16
Nursery Superintendents	----	----	----	----	----	3	3
Draughtsmen	4	2	2	4	3	18	33
Clerks, Stenographers, and Messengers	62	16	13	19	17	91	218
Superintendent and Foreman, Forest Service Marine Station	----	----	----	----	----	4	4
Mechanics, Carpenters, and Technicians	3	----	----	----	----	27	30
Launch Crewmen	12	----	----	----	----	----	12
Assistant and Acting Rangers	27	14	14	31	25	----	111
Dispatchers	16	6	2	9	8	2	43
Cruisers and Compass-men	3	----	1	2	----	----	6
Truck and Tractor Operators	3	----	----	----	----	16	19
Foremen	1	----	----	1	----	6	8
Miscellaneous	----	----	1	4	1	30	36
Total, continuous personnel	246	63	60	121	94	308	892
Seasonally Employed							
Assistant and Acting Rangers	16	6	14	11	17	----	64
Patrol-men	7	3	8	15	13	----	46
Lookout-men	30	10	16	25	34	----	115
Dispatchers and Radio Operators	4	----	3	7	10	----	24
Fire-suppression Crewmen	45	----	----	45	32	----	122
Reforestation—Snag-fallers, Planters, etc.	----	----	----	----	----	450	450
Cruisers and Compass-men	----	----	----	1	1	6	8
Truck and Tractor Operators	----	3	5	9	8	4	29
Student Assistants	2	3	3	6	11	81	106
Silvicultural Crewmen	----	9	8	10	10	----	37
Foremen	5	1	1	6	7	7	27
Miscellaneous	1	10	11	7	2	106	137
Total, seasonal personnel	110	45	69	142	145	654	1,165
Total, all personnel	356	108	129	263	239	962	2,057

(2)

SUMMARY OF PLANTING DURING THE YEARS 1941–50

Year	Experimental		Forest Service on Crown Land		Private Companies		Community Forests		Private Planting and Farm Wood-lots		Total	
	Trees in Thousands	Acres	Trees in Thousands	Acres	Trees in Thousands	Acres	Trees in Thousands	Acres	Trees in Thousands	Acres	Trees in Thousands	Acres
1950	.....	.....	6,261.6	6,670.0	553.1	680.0	52.0	50.0	20.9	.....	6,887.6	7,400.0
1949	15.3	15.0	7,418.5	8,125.0	855.5	1,010.0	5.0	.....	23.2	15.0	8,317.5	9,165.0
1948	3.4	4.0	9,123.3	10,560.0	1,402.0	2,140.0	5.0	5.0	18.4	20.0	10,552.1	12,729.0
1947	.....	.....	3,466.5	4,380.0	473.5	490.0	.....	.....	34.0	20.0	3,974.0	4,890.0
1946	.....	.....	3,670.2	6,000.0	3,854.2	4,700.0	.....	.....	6.7	7.0	7,531.1	10,707.0
1945	.....	.....	160.0	180.0	1,035.0	1,215.0	.....	.....	8.4	10.0	1,203.4	1,405.0
1944	68.0	70.0	7,108.2	9,175.0	600.0	914.0	102.0	132.0	11.4	11.0	7,889.6	10,302.0
1943	22.4	25.0	8,535.0	10,804.0	556.9	510.0	70.5	70.0	12.4	12.0	9,197.2	11,421.0
1942	5.3	5.0	6,673.8	7,908.0	.....	.....	2.5	3.0	12.5	12.0	6,694.1	7,928.0
1941	7.3	7.0	8,267.7	10,188.0	460.0	550.0	15.0	15.0	2.2	2.0	8,752.2	10,762.0
Previously planted	607.0	510.7	2,340.3	2,950.0	326.2	387.3	109.0	97.0	28.9	28.0	3,411.4	3,973.0
Totals to date	728.7	636.7	63,025.1	76,940.0	10,116.4	12,596.3	361.0	372.0	179.0	137.0	74,410.2	90,682.0

(3)

Estimated Value of Production, Including Loading and Freight within the Province

Product	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	Ten-year Average, 1941–50
Lumber	$64,596,000	$67,150,000	$66,520,000	$81,495,000	$78,244,000	$87,013,502	$155,761,222	$219,289,000	$206,228,610	$303,384,304	$132,968,163
Pulp and paper	27,723,000	27,457,000	25,597,000	30,391,000	33,782,000	41,800,555	57,145,678	73,989,000	68,482,241	78,739,573	46,510,704
Shingles	11,550,000	12,822,000	8,332,000	10,006,000	10,544,000	12,946,506	23,625,946	25,094,000	16,881,240	37,502,958	16,930,466
Boxes	4,707,000	5,397,000	4,697,000	7,218,000	7,855,000	8,288,491	10,430,608	6,129,000	3,424,268	3,837,067	6,198,344
Doors	*	*	*	*	*	*	*	*	*	*	*
Plywood	.....	.....	.....	6,100,000	6,000,000	9,120,000	20,830,000	22,430,000	21,500,000	26,250,000	16,032,857†
Piles, poles, and mine-props	1,723,000	2,576,000	2,387,000	2,088,000	2,986,000	5,125,762	5,225,000	4,158,000	4,470,379	5,127,681	3,586,682
Cordwood, fence-posts, and lagging	1,522,000	2,165,000	4,485,000	3,303,000	2,621,000	2,647,488	2,200,000	1,671,000	2,058,200	2,189,249	2,486,194
Ties, railway	204,000	221,000	268,000	484,000	507,000	478,519	580,000	671,000	467,127	281,308	416,196
Additional value contributed by the wood-using industry	2,000,000	2,500,000	2,800,000	1,600,000	1,500,000	1,700,000	1,600,000	1,800,000	2,000,000	2,250,000	1,975,000
Laths and other miscellaneous products	1,500,000	1,500,000	1,400,000	1,500,000	1,500,000	1,400,000	1,200,000	1,598,000	1,454,000	1,723,616	1,477,562
Logs exported	4,212,000	2,618,000	1,555,000	2,065,000	1,766,000	2,349,280	3,313,672	6,435,000	4,029,069	5,741,784	3,408,480
Pulp-wood exported	7,000	2,000	16,000	35,000	25,000	6,787	32,610	29,000	139,200	741,128	103,373
Christmas trees	176,000	162,000	227,000	236,000	271,000	402,056	293,652	470,000	445,965	583,549	326,722
Cascara bark	.....	150,000	150,000	90,000	54,000	192,421	50,000	23,000	9,250	18,925	81,955‡
Totals	$119,920,000	$124,720,000	$118,434,000	$146,611,000	$147,655,000	$173,471,370	$282,288,388	$363,786,000	$331,589,549	$468,371,142	.....

* Included in wood-using industry value. † Average for seven-year period only. ‡ Average for nine-year period only.

(4)

Paper Production (in Tons)

Product	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	Ten-year Average, 1941–50
Newsprint	275,788	252,559	211,696	236,696	253,671	259,921	338,239	327,764	378,355	388,191	292,299
Other papers	75,453	74,915	63,026	74,038	80,691	82,833	72,755	79,446	83,927	89,437	77,653

In addition to 457,515 tons of pulp manufactured into paper in the Province, 278,802 tons were shipped out of the Province during the year.

(5)

WATER-BORNE LUMBER TRADE (IN M B.M.)

Destination	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	Ten-year Average, 1941–50
Australia	49,614	13,819	45,452	55,332	68,600	67,269	71,313	54,376	83,523	90,936	60,024
New Zealand	2,517	2,199	.....	3,150	5,637	5,892	15,362	6,768	10,702	8,823	6,105
South America	28,091	4,244	2,433	.....	.....	11,794	5,519	5,486	7,234	2,227	6,703
China	9,663	.....	.....	.....	229	58,632	48,426	34,390	4,318	7,087	16,275
Japan	.....	.....	.....	.....	.....	.....	.....	.....	.....	86	9
United Kingdom and Continent	479,861	466,902	653,847	618,517	595,473	418,960	744,804	470,445	345,812	243,632	503,825
South Africa	68,142	20,878	24,924	44,214	46,732	95,588	69,136	108,384	101,957	89,152	66,910
India and Straits Settlements	2,292	846	.....	50	51	161	8,783	2,497	12,261	2,621	2,956
United States and Atlantic Coast	68,383†	6,368†	3,301†	†	9,587†	2,905	205	104,636	310,411	736,831	124,263
Philippine and Hawaiian Islands	.....	.....	83	.....	.....	1,084	73	13,901	11,086	13,112	3,934
West Indies and Cuba	19,056	4,683	3,930	8,240	10,412	16,832	18,934	4,328	9,754	8,654	10,483
South Sea Islands	5,074	5,060	1,402	5,350	2,370	3,565	6,388	5,930	7,668	7,751	5,055
Mexico and Central America	2,975	229	.....	.....	4	5,812	7	435	4,619	89	1,417
Egypt, Palestine, and Arabia	88	146	237	1,278	1,241	19,185	28,451	10,291	11,744	7,634	8,030
Belgium*	.....	.....	.....	.....	2,243	897	180	1,203	3,202	8,958	1,668
Denmark*	.....	.....	.....	.....	.....	420	.....	.....	51	5	48
France*	.....	.....	.....	.....	2,109	16,229	26,107	30	1,841	.....	4,631
Germany*	.....	.....	.....	.....	.....	.....	.....	.....	51	.....	5
Holland*	.....	.....	.....	.....	.....	17,387	52,813	7,883	1,945	1,917	8,194
Italy*	.....	.....	.....	581	313	.....	80	47	294	549	186
Norway and Sweden*	.....	.....	.....	.....	.....	.....	.....	.....	258	709	97
Foreign, unclassified	279†	29†	250†	2,086†	2,031†	2,603	12,597	10,568	6,939	20,423	5,780
Totals	736,035	525,403	735,859	738,798	747,032	745,215	1,109,178	841,598	935,670	1,251,196	836,598

* Previously included with United Kingdom.
† Includes a considerable volume with destination unknown due to cloaking of war shipments.

(6)

Total Amount of Timber Scaled in British Columbia during the Years 1949–50 (in F.B.M.)

Forest District	1949	1950	Gain	Loss	Net Gain
Vancouver	2,962,078,034	3,314,537,513	352,459,479	.....	.....
Prince Rupert	174,799,387	161,554,917	.....	13,244,470	.....
Totals, Coast	3,136,877,421	3,476,092,430	352,459,479	13,244,470	.....
Prince Rupert (I.)	98,910,325	124,467,500	25,557,175	.....	.....
Fort George	263,403,404	321,294,753	57,891,349	.....	.....
Kamloops	298,230,238	355,946,635	57,716,397	.....	.....
Nelson	252,260,939	282,278,806	30,017,867	.....	.....
Totals, Interior	912,804,906	1,083,987,694	171,182,788	.....	.....
Grand totals	4,049,682,327	4,560,080,124	523,642,267	13,244,470	510,397,797

(7)

SPECIES CUT, ALL PRODUCTS (IN F.B.M.), 1950

Forest District	Fir	Cedar	Spruce	Lodge-pole Pine	Hemlock	Balsam	White Pine	Yellow Pine	Cypress	Larch	Hard-woods	Cotton-wood	Total
Vancouver	1,475,638,968	695,608,446	51,350,714	.....	835,247,885	217,415,331	22,107,798	95,366	6,184,243	.....	8,637,357	2,251,405	3,314,537,513
Prince Rupert	8,516,296	35,563,410	49,194,457	110,076	57,040,203	8,850,336	286	.....	212,090	.....	27,641	2,040,122	161,554,917
Totals, Coast	1,484,155,264	731,171,856	100,545,171	110,076	892,288,088	226,265,667	22,108,084	95,366	6,396,333	.....	8,664,998	4,291,527	3,476,092,430
Prince Rupert (I.)	39,344	8,331,118	77,342,721	22,915,549	10,379,041	5,200,277	.....	.....	.....	.....	259,450	.....	124,467,500
Fort George	73,451,488	2,372,968	213,995,932	27,446,666	.....	3,456,018	.....	.....	9,495	.....	48,236	513,950	321,294,753
Kamloops	204,590,731	31,413,722	47,528,313	3,586,660	2,832,770	2,588,802	10,227,191	32,076,684	.....	19,733,920	254,934	1,112,908	355,946,635
Nelson	71,961,194	27,996,434	47,475,649	6,808,406	14,889,631	1,922,394	13,614,884	14,806,679	.....	82,471,003	60,013	272,519	282,278,806
Totals, Interior	350,042,757	70,114,242	386,342,615	60,757,281	28,101,442	13,167,491	23,842,075	46,883,363	9,495	102,204,923	622,633	1,899,377	1,083,987,694
Grand totals	1,834,198,021	801,286,098	486,887,786	60,867,357	920,389,530	239,433,158	45,950,159	46,978,729	6,405,828	102,204,923	9,287,631	6,190,904	4,560,080,124

Cubic Scale Converted to F.B.M. (Included Above)

(Conversion factor: Coast—1 cubic foot=5.7 board-feet; Interior—1 cubic foot=5 board-feet.)

Vancouver	.....	.....	114,291	.....	17,525,739	1,257,871	.....	.....	.....	.....	.....	.....	18,897,901
Nelson	34,890	60,441	8,718	220	381,708	.....	36,135	.....	.....	6,867	.....	.....	528,979
Totals	34,890	60,441	123,009	220	17,907,447	1,257,871	36,135	.....	.....	6,867	.....	.....	19,426,880

(8)

TOTAL SCALE (IN F.B.M.) SEGREGATED, SHOWING LAND STATUS, ALL PRODUCTS, 1950

	Forest District						Total
	Vancouver	Prince Rupert (Coast)	Prince Rupert (Interior)	Fort George	Kamloops	Nelson	
Timber licences	740,701,524	14,230,224	.....	7,325,432	5,670,764	14,347,532	782,275,476
Timber berths	155,836,379	.....	.....	.....	13,024,931	174,293	169,035,603
Timber leases	136,238,729	.....	.....	.....	.....	45,460	136,284,189
Pulp leases	2,768,175	12,918,519	.....	.....	.....	.....	15,686,694
Pulp licences	10,901,432	48,374,390	.....	.....	.....	.....	59,275,822
Hand-loggers' licences	27,946	324,677	.....	.....	.....	.....	352,623
Dominion lands	53,200,467	456,638	4,316,860	.....	10,793,560	6,275,002	75,042,527
Timber sales	738,720,846	44,486,796	104,840,228	275,234,049	236,616,521	186,922,422	1,586,820,862
Pulp-timber sales	3,021	29,702,833	.....	.....	.....	.....	29,705,854
No mark visible	115,793,725	.....	.....	.....	.....	.....	115,793,725
Miscellaneous	2,957,214	504,623	4,628,284	7,995,686	12,753,802	8,596,852	37,436,461
Management licences	897,097	.....	.....	.....	.....	528,980	1,426,077
Forest Reserve Account	71,861	.....	.....	.....	.....	.....	71,861
Crown grants—							
To 1887	1,149,430,064	.....	.....	236,509	27,257,509	2,323,674	1,179,247,756
1887 to 1906	103,875,288	427,584	507,986	437,109	6,167,823	35,185,526	146,601,316
1906 to 1914	35,697,829	1,810,065	3,741,013	3,823,631	15,996,616	12,234,176	73,303,330
1914 to date	67,415,916	8,318,568	6,433,129	26,242,337	27,665,109	15,644,889	151,719,948
Totals	3,314,537,513	161,554,917	124,467,500	321,294,753	355,946,635	282,278,806	4,560,080,124

Timber from lands in the former Dominion Government Railway Belt which has passed over to the jurisdiction of this Province is included under the various land-status headings shown above.

Only timber from Indian reserves and other lands still under the jurisdiction of the Dominion Government is shown under the heading "Dominion Lands."

Cubic Scale Converted to F.B.M. (Included Above), Showing Land Status, All Products

(Conversion factor: Coast—1 cubic foot=5.7 board-feet; Interior—1 cubic foot=5 board-feet.)

Forest District	Management Licences	Timber Licences	Timber Sales	No Mark Visible	Crown Grants			Total
					To 1887	1887–1906	1914 to Date	
Vancouver	.....	778,227	990,256	10,123	16,936,302	80,986	102,007	18,897,901
Nelson	528,980	.....	.....	.....	.....	.....	.....	528,980
Totals	528,980	778,227	990,256	10,123	16,936,302	80,986	102,007	19,426,881

PROVINCIAL LIBRARY,
VICTORIA, B. C.

TIMBER SCALED IN BRITISH COLUMBIA IN 1950 (BY MONTHS AND DISTRICTS)

Month	Vancouver	Prince Rupert (Coast)	Prince Rupert (Interior)	Fort George	Kamloops	Nelson	Total F.B.M.	Total Cubic Feet	Total Lineal Feet	Total Cords	Total Hewn Ties
January—											
F.B.M.	28,219,910	2,774,811	6,106,598	16,855,493	19,994,949	19,534,184	93,485,945				
Cubic feet											
Lineal feet	353,174		198,474	105,903	1,536,280	750,371			2,944,202		
Cords	2,286		135	1,106	2,213	1,931				7,671	
Hewn ties			4,570	500	4,218	241					9,529
February—											
F.B.M.	81,181,501	261,840	5,763,869	17,692,327	12,211,647	7,238,388	124,349,572				
Cubic feet	105,035							105,035			
Lineal feet	197,200		62,339	36,463	971,174	101,324			1,368,500		
Cords	1,846	24	328	635	2,800	1,697				7,330	
Hewn ties			425	427	2,550						3,402
March—											
F.B.M.	156,628,584	2,929,426	11,460,966	34,203,384	15,705,450	16,821,436	237,749,246				
Cubic feet	175,439							175,439			
Lineal feet	468,004	6,525	35,630	58,075	70,060	183,705			821,999		
Cords	2,632	67	134	505	1,863	2,060				7,261	
Hewn ties			4,958	1,203		231					6,392
April—											
F.B.M.	259,158,212	5,059,770	13,588,160	44,931,653	12,191,098	12,639,054	347,567,947				
Cubic feet											
Lineal feet	601,256	5,645	88,180	93,996	103,243	143,314			1,035,634		
Cords	5,111	28	196	406	658	1,190				7,589	
Hewn ties	1,536		9,147	15,225	3,410	615					29,933
May—											
F.B.M.	339,849,557	16,780,194	7,590,494	16,764,145	16,683,748	9,662,670	407,330,808				
Cubic feet	320,599							320,599			
Lineal feet	801,971	3,929	90,240	15,225	185,154	256,359			1,352,878		
Cords	4,819		292	896	2,975	1,732				10,714	
Hewn ties	1,339		14,120	9,006	2,367	610					27,442
June—											
F.B.M.	381,199,086	22,022,350	5,768,206	8,958,518	21,345,204	18,745,700	458,039,064				
Cubic feet	274,430							274,430			
Lineal feet	1,146,977	17,670	61,890	19,590	355,218	287,875			1,889,220		
Cords	5,552	155	421	1,221	3,266	2,255				12,870	
Hewn ties	2,032		14,275	8,003	2,919	498					27,727
July—											
F.B.M.	314,173,104	12,279,527	7,651,350	19,954,634	29,024,266	27,997,038	411,079,919				
Cubic feet	409,962							409,962			
Lineal feet	1,056,304	30,250	44,945	85,850	417,341	278,198			1,912,888		
Cords	4,715		168	702	1,483	2,832				9,900	
Hewn ties	1,617		1,204	11,619	1,563	661					16,664

August—											
F.B.M.	362,742,597	25,621,114	11,750,183	28,505,753	47,962,971	32,876,568	509,459,186				
Cubic feet	380,339							380,339			
Lineal feet	589,749	18,345	55,925	32,240	1,459,348	435,014			2,590,621		
Cords	4,446		109	672	1,856	904				7,987	
Hewn ties	100		11,224	1,877	5,556	2,391					21,148
September—											
F.B.M.	333,993,394	15,629,957	11,886,357	38,218,166	38,799,818	24,823,117	463,350,809				
Cubic feet	370,292							370,292			
Lineal feet	701,131	3,603	320,980	14,595	1,204,856	260,689			2,505,854		
Cords	5,320		91	320	1,382	3,608				10,721	
Hewn ties			14,260		2,225	5,030					21,515
October—											
F.B.M.	351,420,221	26,228,497	12,113,685	35,009,263	38,740,638	37,467,163	500,979,467				
Cubic feet	457,607							457,607			
Lineal feet	861,300	1,042	126,932	95,016	1,133,244	437,855			2,655,389		
Cords	6,556		492	448	1,184	2,323				11,003	
Hewn ties				24,772	11,416	1,350					37,538
November—											
F.B.M.	338,647,112	21,169,099	11,716,176	27,651,696	35,479,977	24,281,171	458,945,231				
Cubic feet	384,732					53,140.4		437,872.4			
Lineal feet	921,775	3,793	855,458	96,749	1,023,868	833,464			3,735,107		
Cords	4,935		149	185	1,518	2,196				8,983	
Hewn ties	2,407		9,685	1,171	775	3,629					17,667
December—											
F.B.M.	300,152,851	10,387,361	7,577,492	23,121,688	28,404,144	24,347,709	393,991,245				
Cubic feet	436,986					105,795.9		542,781.9			
Lineal feet	597,323	713	366,185	30,100	697,855	871,625			2,563,801		
Cords	4,294		126	273	1,314	2,258				8,265	
Hewn ties				27,400	7,208	2,100					36,708
Totals, 1950—											
F.B.M.	3,247,366,129	161,143,946	112,973,536	311,866,720	316,543,910	256,434,198	4,406,328,439				
Cubic feet	3,315,421					158,936.3		3,474,357.3			
Lineal feet	8,296,164	91,515	2,307,178	683,802	9,157,641	4,839,793			25,376,093		
Cords	52,512	274	2,641	7,369	22,512	24,986				110,294	
Hewn ties	9,031		83,868	101,203	44,207	17,356					255,665

Total scale in F.B.M., 4,560,080,124.

(10)

LOGGING INSPECTION, 1950

Forest District	Type of Tenure Operated				Number of Inspections
	Timber Sales	Hand-loggers' Licences	Leases, Licences, Crown Grants, and Pre-emptions	Totals	
Vancouver	1,195	1	1,252	2,448	6,404
Prince Rupert	1,122	5	465	1,592	2,989
Fort George	736	.....	70	806	1,539
Kamloops	1,392	.....	1,149	2,541	2,473
Nelson	744	.....	876	1,620	2,816
Totals, 1950	5,189	6	3,812	9,007	16,221
Totals, 1949	6,405	7	4,440	10,852	15,483
Totals, 1948	4,847	5	3,982	8,834	15,432
Totals, 1947	4,428	5	3,190	7,623	13,876
Totals, 1946	3,627	6	3,021	6,654	12,974
Totals, 1945	3,492	9	2,852	6,353	11,901
Totals, 1944	3,373	4	2,540	5,917	11,648
Totals, 1943	3,259	11	2,519	5,789	12,110
Totals, 1942	3,086	18	2,569	5,673	13,753
Totals, 1941	3,207	18	2,833	6,058	11,438
Ten-year average, 1941–50	4,091	9	3,176	7,249	13,484

(11)

TRESPASSES, 1950

Forest District	Number of Cases	Areas Cut Over (Acres)	Quantity Cut							Number of Resulting Seizures	Amount Charged
			Feet B.M.	Lineal Feet	Cords	Ties	Christmas Trees	Cedar Shakes, Car-stakes	Posts		
Vancouver	60	447	6,371,050	136,603	38	.....	191	75,309	.....	9	$53,151.51
Prince Rupert	57	279	1,896,407	71,527	934	845	.....	.....	.....	1	7,311.18
Fort George	21	435	910,496	.....	123	753	200	.....	.....	2	4,649.54
Kamloops	76	1,060	1,787,803	73,725	260	208	2,878	.....	3,373	2	9,305.60
Nelson	62	851	1,787,649	78,335	120	.....	3,043	.....	4,177	2	13,171.40
Totals, 1950	276	3,072	12,753,405	360,190	1,475	1,806	6,312	75,309	7,550	16	$87,589.23
Totals, 1949	418	4,132	20,419,563	244,655	1,298	3,514	9,022	34,070	8,785	28	$81,923.27
Totals, 1948	312	3,062	11,738,855	470,674	3,569	18,211	3,711	11,135	4,100	8	$59,654.37
Totals, 1947	316	5,132	17,234,601	659,621	5,599	5,235	15,416	439,554	17,506	15	$74,761.43
Totals, 1946	226	2,568	7,084,343	1,760,574	1,469	2,900	10,148	41,377	35,997	8	$27,530.63
Totals, 1945	267	3,313	24,322,556	516,960	1,910	9,902	2,438	.....	.....	10	$37,877.12
Totals, 1944	210	2,467	12,317,066	179,219	3,369	4,231	3,781	.....	.....	5	$29,193.16
Totals, 1943	167	3,058	9,744,957	129,409	6,873	552	7,923	.....	.....	7	$23,725.29
Totals, 1942	180	1,159	4,413,906	365,861	4,757	490	1,512	.....	.....	15	$14,391.61
Totals, 1941	236	1,788	7,627,990	526,391	2,887	1,365	4,150	.....	.....	17	$24,253.10
Ten-year average, 1941–50	260	2,977	12,765,800	521,356	3,321	4,821	6,442	.....	.....	13	$46,089.82

(12)

PRE-EMPTION INSPECTION, 1950

Pre-emption Records Examined by District

Vancouver	10
Prince Rupert	----
Fort George	80
Kamloops	106
Nelson	28
Total	224

(13)

AREAS EXAMINED FOR MISCELLANEOUS PURPOSES OF THE "LAND ACT," 1950

Forest District	Applications for Leases		Applications for Pre-emption Records		Applications to Purchase		Miscellaneous		Total	
	Number	Acres	Number	Acres	Number	Acres	Number	Acres	Number	Acres
Vancouver	6	440	2	200	114	6,428	56	106	178	7,174
Prince Rupert	----	----	2	320	13	1,519	8	54	23	1,893
Fort George	5	729	21	3,230	94	8,778	13	415	133	13,152
Kamloops	74	55,357	22	3,081	109	9,802	10	499	215	68,739
Nelson	1	86	2	240	79	6,515	9	480	91	7,321
Totals	86	56,612	49	7,071	409	33,042	96	1,554	640	98,279

(14)

CLASSIFICATION OF AREAS EXAMINED, 1950

Forest District	Total Area	Agricultural Land	Non-agricultural Land	Merchantable Timber Land	Estimated Timber on Merchantable Timber Land
	Acres	Acres	Acres	Acres	M B.M.
Vancouver	7,174	2,522	4,652	640	13,355
Prince Rupert	1,893	356	1,537	14	162
Fort George	13,152	7,567	5,585	427	5,240
Kamloops	68,739	34,310	34,429	370	4,550
Nelson	7,321	3,394	3,927	133	1,250
Totals	98,279	48,149	50,130	1,584	24,557

(15)

Areas Cruised for Timber Sales, 1950

Forest District	Number Cruised	Acreage	Saw-timber (M B.M.)	Pit-props, Poles, and Piles (Lin. Ft.)	Shingle-bolts and Cordwood (Cords)	Railway-ties (No.)	Car-stakes, Posts, Shakes, etc. (No.)
Vancouver	728	70,835	585,419	400,869	4,903	.....	9,500
Prince Rupert	385	53,723	271,193	1,233,510	5,404	35,920	3,500
Fort George	428	72,976	389,189	352,200	3,505	82,971	42,100
Kamloops	405	89,702	271,281	2,698,805	6,753	2,200	.....
Nelson	250	66,199	259,943	2,703,491	3,957	2,000	297,340
Totals, 1950	2,196	333,435	1,777,025	7,388,875	24,522	123,091	352,440
Totals, 1949	1,638	269,576	1,355,342	9,599,176	57,002	170,475	738,510
Totals, 1948	1,851	346,648	1,817,737	7,603,641	44,726	180,602	1,947,010
Totals, 1947	1,960	361,834	1,481,715	23,015,436	50,346	299,501	1,064,125
Totals, 1946	2,059	362,587	1,230,716	40,760,769	90,078	216,892	2,718,706
Totals, 1945	1,488	261,150	948,673	48,743,325	95,774	301,276	1,802,468
Totals, 1944	1,476	334,729	1,205,308	8,166,829	137,737	483,363	1,345,439
Totals, 1943	1,771	590,953	907,768	10,720,729	259,741	454,767	816,544
Totals, 1942	1,469	305,222	794,676	8,562,739	100,232	381,106	743,500
Totals, 1941	1,611	321,220	689,595	15,794,246	126,463	199,174	263,480
Ten-year average, 1941–50	1,753	348,735	1,220,855	17,835,578	98,663	281,020	1,159,223

(16)

Timber-sale Record, 1950

District	Sales Made	Sales Closed	Total Existing	Total Area (Acres)	Acreage Paying Forest Protection Tax	Total 10-per-cent Deposits
Vancouver	651	604	1,620	356,412	256,266	$1,342,614.27
Prince Rupert	392	384	1,055	224,405	187,095	287,766.47
Fort George	386	293	942	209,693	152,108	348,483.05
Kamloops	462	497	1,657	435,657	408,469	479,456.72
Nelson	269	344	990	308,152	278,663	338,452.81
Totals	2,160	2,122	6,264	1,534,319	1,282,601	$2,796,773.32
Including cash sales	431	.....	.....	.....	.....	.....
Total sales	2,591	.....	.....	.....	.....	.....

Timber Sales Awarded by Districts, 1950

Forest District	No. of Sales	Acreage	Saw-timber (F.B.M.)	Poles and Piling (Lin. Ft.)	No. of Posts	No. of Cords	No. of Ties	No. of Christmas Trees	No. of Hop-poles	No. of Car-stakes	No. of Blasting-sticks	No. of Fence-rails	No. of Bean-poles	No. of Cedar Shakes	Estimated Revenue
Vancouver	662	90,263	718,315,000	395,655	3,800	9,272	2,025	.....	.....	.....	.....	.....	.....	113,720	$4,488,276.58
Prince Rupert	409	47,134	155,839,500	1,599,145	12,750	3,155	85,547	300	.....	1,000	.....	.....	.....	.....	698,867.45
Nelson	345	67,938	166,962,000	4,881,210	455,560	5,135	2,300	.....	.....	.....	.....	.....	.....	.....	852,825.56
Prince George	543	63,213	328,667,000	759,076	65,900	5,768	45,170	.....	.....	.....	.....	.....	.....	.....	1,564,150.50
Kamloops	632	103,689	258,383,000	4,816,421	255,966	8,455	9,550	.....	.....	700	.....	.....	.....	.....	1,548,671.72
Totals, 1950	2,591	372,237	1,628,166,500	12,451,507	793,976	31,785	144,592	300	.....	1,700	.....	.....	.....	113,720	$9,152,791.81
Totals, 1949	2,525	375,717	1,238,155,000	10,298,466	1,601,707	57,557	200,300	.....	.....	2,650	.....	.....	.....	542,000	$5,669,035.70
Totals, 1948	2,611	440,198	1,824,615,000	12,052,076	966,267	65,599	235,583	.....	.....	.....	117,000	.....	.....	1,247,800	$8,544,121.84
Totals, 1947	2,469	375,781	1,469,890,000	27,185,542	1,291,482	64,576	236,851	.....	3,000	1,800	.....	.....	.....	636,385	$7,097,435.12
Totals, 1946	2,637	443,505	1,262,948,000	55,461,304	2,982,443	87,322	266,338	.....	600	5,350	.....	.....	1,000	2,072,726	$5,036,148.66
Totals, 1945	1,898	330,190	949,614,000	39,645,792	2,325,117	76,221	255,242	.....	2,500	2,450	.....	.....	.....	.....	$3,475,676.91
Totals, 1944	1,893	345,132	855,187,000	6,866,301	1,665,783	93,058	381,571	.....	.....	620	60,000	.....	10,000	.....	$2,879,952.84
Totals, 1943*	2,016	394,981	888,580,000	10,875,063	943,827	214,317	336,251	.....	20,000	3,970	150,000	1,000	.....	.....	$3,064,953.20
Totals, 1942	1,710	363,193	751,591,000	11,944,558	746,345	100,812	299,905	.....	.....	4,420	.....	.....	.....	.....	$2,339,521.06
Totals, 1941	1,853	362,997	623,121,000	14,763,144	639,015	103,422	198,549	.....	2,500	5,300	.....	100	.....	.....	$1,953,469.79
Ten-year average 1941–50	2,220	380,393	1,149,186,750	20,154,375	1,395,596	89,467	255,518	.....	.....	.....	.....	.....	.....	.....	$4,921,310.69

* Revised figures.

(18)

Average Stumpage Prices as Bid per M B.F. Log-scale, by Species and Forest Districts, on Saw-timber cruised on Timber Sales in 1950

Forest District	Douglas Fir			Cedar			Spruce			Hemlock			Balsam		
	M B.F.	Price per M	Price Range per M	M B.F.	Price per M	Price Range per M	M B.F.	Price per M	Price Range per M	M B.F.	Price per M	Price Range per M	M B.F.	Price per M	Price Range per M
Vancouver	301,164	$7.96	$2.75–22.00	168,122	$6.63	$2.25–21.50	9,219	$3.59	$2.50– 7.00	174,028	$3.42	$2.00–18.50	73,537	$2.46	$2.00–10.00
Prince Rupert (Coast)	5,318	5.52	4.50– 6.00	6,008	3.77	2.25–12.00	10,881	4.40	2.25– 9.75	10,317	3.30	2.25– 6.75	2,702	3.36	2.50– 4.25
Prince Rupert (Interior)	291	3.57	3.25– 3.75	3,326	3.77	3.25– 5.75	66,243	3.98	3.25– 6.50	15,331	3.56	3.00– 4.05	6,174	3.57	2.50– 5.00
Fort George	54,963	4.26	3.00– 7.90	.....	.....	.....	218,920	4.47	2.25– 8.20	.....	.....	.....	6,463	3.34	2.50– 7.70
Kamloops	150,836	4.36	2.00–12.00	2,343	3.84	2.25– 6.00	30,870	5.28	2.75–11.50	3,833	3.48	.....	4,964	3.43	2.25– 6.50
Nelson	40,286	4.32	1.50–12.00	11,686	3.06	1.50– 9.30	28,691	5.09	1.60–14.00	13,588	2.95	1.50– 8.50	3,632	2.94	1.50– 6.00
Totals for Province	557,858	$6.33	.....	191,485	$6.23	.....	364,824	$4.47	.....	217,097	$3.42	.....	97,472	$2.67	.....

Forest District	White Pine			Western Yellow Pine			Larch (Tamarack)			Other Species			All Species		
	M B.F.	Price per M	Price Range per M	M B.F.	Price per M	Price Range per M	M B.F.	Price per M	Price Range per M	M B.F.	Price per M	Price Range per M	M B.F.	Price per M	Price Range per M
Vancouver	3,290	$8.29	$4.50–16.25	16	$4.00	$4.00– 4.00	.....	.....	.....	5,687	$4.63	$2.50–19.00	740,063	$5.97	$2.00–22.00
Prince Rupert (Coast)	.....	.....	.....	.....	.....	.....	.....	.....	.....	608	3.18	2.50– 4.00	35,834	4.04	2.25–12.00
Prince Rupert (Interior)	.....	.....	.....	.....	.....	.....	.....	.....	.....	31,779	3.85	2.90– 6.50	123,144	3.88	2.50– 6.50
Fort George	.....	.....	.....	.....	.....	.....	.....	.....	.....	19,285	4.00	2.25– 7.25	299,631	4.37	2.25– 8.20
Kamloops	13,817	10.49	5.00–21.50	23,027	6.28	3.25–11.00	22,911	$5.82	$2.75–10.50	5,015	4.64	2.00–10.50	257,616	5.06	2.00–21.50
Nelson	8,116	9.09	7.00–15.50	6,286	6.98	3.80–18.00	54,125	4.45	1.50–12.00	1,805	4.11	1.50– 9.10	168,215	4.59	1.50–18.00
Totals for Province	25,223	$9.75	.....	29,329	$6.42	.....	77,036	$4.85	.....	64,179	$4.03	.....	1,624,503	$5.19	.....

NOTE.—Stumpage inclusive of royalty.

(19)

Average Stumpage Prices Received per M B.F. Log-scale, by Species and Forest Districts, on Saw-timber Scaled from Timber Sales in 1950

Forest District	Douglas Fir		Cedar		Spruce		Hemlock		Balsam		White Pine		Yellow Pine		Larch		Other Species		All Species	
	M B.F.	Price per M	M B.F.	Price per M	M B.F.	Price per M	M B.F.	Price per M	M B.F.	Price per M	M B.F.	Price per M	M B.F.	Price per M	M B.F.	Price per M	M B.F.	Price per M	M B.F.	Price per M
Vancouver	303,056	$5.84	175,838	$4.62	12,073	$3.58	177,103	$2.87	48,361	$2.88	4,856	$6.88	95	$4.95	.....	.....	2,265	$4.69	723,647	$4.58
Prince Rupert (C.)	3,416	4.46	15,710	2.78	21,374	2.94	25,787	2.20	5,925	3.07	.....	.....	.....	.....	.....	.....	2,227	4.02	74,439	2.76
Prince Rupert (I.)	39	3.30	1,183	4.09	65,212	3.79	5,613	3.32	4,903	3.47	.....	.....	.....	.....	.....	.....	16,286	3.74	93,236	3.73
Fort George	53,660	3.91	181	2.41	189,696	4.31	.....	.....	2,747	3.04	.....	.....	.....	.....	.....	.....	16,050	3.43	262,334	3.43
Kamloops	131,950	3.37	2,093	2.78	39,211	4.04	1,922	2.49	2,470	2.89	5,928	7.84	14,834	5.23	13,948	$3.00	1,372	3.43	213,728	3.70
Nelson	43,788	3.77	8,752	3.19	26,795	4.77	11,120	3.02	1,197	3.21	8,068	8.86	6,775	5.38	65,590	3.75	1,753	3.37	173,838	4.13
Totals for Province	535,909	$4.86	203,757	$4.38	354,361	$4.11	221,545	$2.80	65,603	$2.95	18,852	$8.03	21,704	$5.27	79,538	$3.61	39,953	$3.65	1,541,222	$4.19

NOTE.—Vancouver District figures in this table do not include royalty in some cases. In all other districts, stumpage rates quoted include royalty.

TIMBER CUT FROM TIMBER SALES DURING 1950

District	Board-feet	Lineal Feet	Cords	Ties	Posts	Christmas Trees	Hop-poles	Stakes and Sticks	Car-stakes	Stubs	Blasting-sticks	Anchor-blocks	Shingle-shakes	Shake Blanks	Cubic Feet
Vancouver	727,600,082	415,187	3,704.00	1,699	13,144	.....	3,940	631,900	350	.....	.....	.....	4,480,878	956,777	173,729
Prince Rupert	139,702,625	2,029,518	1,865.00	66,234	1,500	50	.....	.....	1,550	.....	.....	.....	.....	.....	.....
Fort George	267,674,561	594,417	5,366.00	74,750	9,280	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kamloops	213,727,777	5,269,990	9,327.00	22,569	388,600	.....	.....	.....	200	.....	12,000	.....	.....	.....	.....
Nelson	173,837,376	3,083,980	3,998.00	10,653	689,200	173,998	.....	.....	250	.....	.....	.....	.....	.....	.....
Totals, 1950	1,522,542,421	11,393,092	24,260.00	175,905	1,101,724	174,048	3,940	631,900	2,350	.....	12,000	.....	4,480,878	956,777	173,729
Totals, 1949	1,310,203,222	13,412,816	33,148.00	327,215	1,357,854	197,699	8,126	756,725	8,650	.....	77,000	.....	2,061,390	470,162	17,121
Totals, 1948	1,355,986,827	13,329,783	42,102.00	357,618	1,403,700	157,944	4,072	1,031,925	2,975	.....	.....	.....	4,585,000	286,750	.....
Totals, 1947	1,263,834,114	24,205,192	42,463.62	391,343	2,140,769	408,239	21,336	.....	3,252	.....	75	.....	.....	.....	.....
Totals, 1946	792,163,118	35,854,520	56,123.50	311,596	1,696,068	224,712	63,974	.....	15,218	.....	75,675	100	2,210,919	.....	.....
Totals, 1945	696,065,196	16,823,506	49,028.79	413,093	1,335,191	415,093	15,596	13,596	21,249	.....	.....	.....	5,763	.....	.....
Totals, 1944	643,497,149	8,354,765	79,080.74	435,862	1,356,253	368,410	39,124	363,880	1,989	373	.....	.....	6,000	.....	.....
Totals, 1943	526,361,074	8,881,017	80,313.62	288,140	594,164	341,277	250,342	.....	15,111	.....	36,125	.....	.....	.....	.....
Totals, 1942	499,861,024	9,169,501	43,891.18	189,953	461,231	322,153	96,335	.....	920	.....	.....	.....	.....	.....	.....
Totals, 1941	499,155,819	8,886,147	49,941.85	324,835	311,360	159,968	2,075	.....	2,850	.....	.....	1,900	.....	.....	.....
Ten-year average, 1941–50	910,966,996	15,031,033	50,035.00	321,610	1,172,238	306,357	50,492	.....	7,457	.....	.....	.....	.....	.....	.....

(21)

SAW AND SHINGLE MILLS OF THE PROVINCE, 1950

Forest District	Operating				Shut Down			
	Sawmills		Shingle-mills		Sawmills		Shingle-mills	
	Number	Estimated Eight-hour Daily Capacity, M B.M.	Number	Estimated Eight-hour Daily Capacity, Shingles, M	Number	Estimated Eight-hour Daily Capacity, M B.M.	Number	Estimated Eight-hour Daily Capacity, Shingles, M
Vancouver	426	8,529	61	8,574	59	268	-----	-------
Prince Rupert	267	1,393	-----	-------	20	158	3	84
Fort George	447	3,672	-----	-------	85	554	-----	-------
Kamloops	411	2,734	2	30	18	109	-----	-------
Nelson	275	2,815	2	32	52	373	8	94
Totals, 1950	1,826	19,143	65	8,636	234	1,462	11	178
Totals, 1949	1,671	19,082	61	7,708	314	2,373	17	513
Totals, 1948	1,671	18,570	68	8,464	179	840	11	360
Totals, 1947	1,634	17,546	73	8,609	143	754	6	100
Totals, 1946	1,228	15,256	59	8,656	115	741	8	165
Totals, 1945	931	13,590	51	7,054	137	808	7	150
Totals, 1944	807	14,974	51	6,695	110	702	16	581
Totals, 1943	614	13,623	54	7,411	120	646	19	829
Totals, 1942	551	13,197	70	8,874	149	1,206	11	135
Totals, 1941	557	13,820	76	8,835	129	1,083	5	63
Ten-year average, 1941–50	1,149	15,879	63	8,094	162	1,062	4	308

(22)

EXPORT OF LOGS (IN F.B.M.), 1950

Species	Grade No. 1	Grade No. 2	Grade No. 3	Ungraded	Total
Fir	2,743,510	4,278,477	6,657,266	-------	13,679,253
Cedar	4,491,421	7,274,389	5,092,677	-------	16,858,487
Spruce	-------	27,031	103,645	-------	130,676
Hemlock	1,421,868	9,996,015	76,062,708	-------	87,480,591
Balsam	-------	-------	-------	19,210,615	19,210,615
White pine	-------	9,608	52,801	-------	62,409
Cypress	2,596	38,934	61,870	-------	103,400
Hardwoods	157	841	-------	-------	998
Cottonwood	-------	-------	121	-------	121
Totals, 1950	8,659,552	21,625,295	88,031,088	19,210,615	137,526,550*
Totals, 1949	6,392,228	21,382,979	103,550,707	14,228,041	145,553,955*
Totals, 1948	9,380,092	31,127,805	106,739,296	16,367,096	163,614,289
Totals, 1947	7,156,095	21,100,803	52,368,152	7,552,386	88,177,436
Totals, 1946	6,843,046	17,485,065	28,308,163	33,898,926	86,535,200
Totals, 1945	3,852,321	20,696,800	24,903,105	32,624,170	82,076,396
Totals, 1944	6,724,297	29,051,958	33,851,519	32,027,805	101,655,579
Totals, 1943	2,809,744	17,720,743	28,863,804	29,261,754	78,656,045
Totals, 1942	2,639,167	18,960,886	27,618,347	106,793,550	156,011,950
Totals, 1941	8,549,320	63,485,278	43,165,973	191,879,335	307,079,906
Ten-year average, 1941–50	6,300,586	26,263,762	53,740,014	48,384,368	134,688,730

* Of this total, 124,806,149 F.B.M. were exported from Crown grants carrying the export privilege; 12,720,401 F.B.M. were exported under permit from other areas.

(23)

SHIPMENTS OF POLES, PILING, MINE-PROPS, FENCE-POSTS, RAILWAY-TIES, ETC., 1950

Forest District and Product		Quantity Exported	Approximate Value, F.O.B.	Where Marketed			
				United States	Canada	United Kingdom	Other Countries
Vancouver—							
Poles	lin. ft.	4,437,187	$976,181.14	3,136,191	1,296,093	.....	4,903
Piles	lin. ft.	434,779	95,651.38	58,399	371,880	.....	4,500
Sticks and stakes	lin. ft.	457,200	16,002.00	457,200	.....	.....	.....
Fence-posts	pieces	46,903	11,725.75	2,275	44,628	.....	.....
Cedar shakes	pieces	9,089,949	181,800.00	8,875,429	13,500	.....	201,020
Christmas trees	pieces	84,558	29,595.30	84,558	.....	.....	.....
Pulp-wood	cords	37,266	689,421.00	37,266	.....	.....	.....
Prince Rupert—							
Poles and piling	lin. ft.	1,812,940	398,846.80	789,295	1,023,645	.....	.....
Hewn ties	pieces	71,055	78,160.50	.....	71,055	.....	.....
Posts	cords	38	874.00	.....	38	.....	.....
Nelson—							
Poles	lin. ft.	3,355,759	738,266.98	2,223,400	1,132,359	.....	.....
Piling	lin. ft.	30,688	6,751.36	.....	30,688	.....	.....
Orchard-props	lin. ft.	476,000	5,950.00	476,000	.....	.....	.....
Mine-props	cords	3,714	55,710.00	.....	3,714	.....	.....
Posts	cords	10,651	244,973.00	2,722	7,929	.....	.....
Cordwood	cords	16	156.00	.....	16	.....	.....
Hewn ties	pieces	17,356	19,091.60	.....	15,356	.....	.....
Christmas trees	pieces	777,336	272,067.60	730,870	46,466	.....	.....
Fort George—							
Poles	lin. ft.	413,446	90,951.52	383,211	30,235	.....	.....
Posts	cords	1,761	39,468.00	.....	1,761	.....	.....
Ties	pieces	68,870	75,757.00	.....	68,870	.....	.....
Kamloops—							
Poles and piling	lin. ft.	6,085,640	1,338,840.80	3,347,205	2,738,435	.....	.....
Mine-timbers	lin. ft.	102,275	21,477.75	.....	102,275	.....	.....
Stubs	lin. ft.	1,000	100.00	1,000	.....	.....	.....
Posts	cords	4,260	97,980.00	.....	4,260	.....	.....
Ties	pieces	47,883	52,671.30	1,798	46,085	.....	.....
Christmas trees	pieces	643,168	225,108.80	565,254	77,914	.....	.....
Total value, 1950		.....	$5,763,579.58	.....	.....	.....	.....
Total value, 1949		.....	$5,503,004.37	.....	.....	.....	.....

(24)

SUMMARY FOR PROVINCE, 1950

Product		Volume	Value	Per Cent of Total Value
Poles and piling	lin. ft.	16,570,409	$3,645,489.98	63.3000
Mine-timbers	lin. ft.	102,275	21,477.75	0.3710
Stubs	lin. ft.	1,000	100.00	0.0015
Orchard-props	lin. ft.	476,000	5,950.00	0.0100
Sticks and stakes	lin. ft.	457,200	16,002.00	0.2800
Pulp-wood	cords	37,266	689,421.00	12.0000
Mine-props	cords	3,714	55,710.00	0.9650
Cordwood	cords	16	156.00	0.0025
Fence-posts	cords	16,665	383,295.00	6.6500
Fence-posts	pieces	46,903	11,725.75	0.2200
Cedar shakes	pieces	9,089,949	181,800.00	3.2000
Hewn ties	pieces	205,164	225,680.40	3.9000
Christmas trees	pieces	1,505,062	526,771.70	9.1000
Total value		.....	$5,763,579.58	100.0000

(25)

TIMBER MARKS ISSUED

	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	Ten-year Average, 1941–50
Old Crown grants	211	160	190	280	329	631	738	791	548	549	443
Crown grants, 1887–1906	85	85	98	89	115	200	191	156	128	169	132
Crown grants, 1906–1914	101	92	104	81	106	176	176	150	97	165	125
Section 55, " Forest Act "	282	250	283	234	337	473	489	439	352	505	364
Stumpage reservations	64	79	72	51	53	70	75	82	60	69	67
Pre-emptions under sections 28 and 29, " Land Act "	1	2	2	1	2	3	8	5	.....	5	3
Timber berths	16	9	5	9	3	8	9	4	7	8	8
Indian reserves	5	4	11	10	16	15	18	20	18	32	15
Timber sales	1,853	1,709	2,017	1,893	1,898	2,637	2,469	2,612	2,525	2,591	2,221
Hand-loggers	11	19	9	8	6	.....	.....	.....	.....	.....	5
Special marks	6	6	5	6	15	35	32	40	26	27	19
Pulp leases	2	2	1	1	.....	.....	.....	.....	1	4	1
Pulp licences	17	1	4	1	2	.....	1	2	1	4	3
Totals	2,654	2,418	2,801	2,664	2,882	4,248	4,206	4,301	3,763	4,134	3,408
Transfers and changes of marks	307	224	237	251	327	486	655	745	550	752	454

(26)

FOREST SERVICE DRAUGHTING OFFICE, 1950

Month	Number of Drawings Prepared or Tracings Made						Number of Blue-prints or Ditto-prints Made from Draughting Office Drawings		
	Timber Sales	Timber Marks	Examination Sketches	Miscellaneous Matters	Constructional Works, etc.	Total	Blue-prints	Ditto-prints	Total
January	54	89	65	30	253	491	740	1,092	1,832
February	37	72	46	32	6	193	957	717	1,674
March	42	183	103	29	3	360	1,073	875	1,948
April	40	109	69	26	6	250	1,089	886	1,975
May	77	255	98	57	21	508	949	1,530	2,479
June	68	217	118	96	21	520	1,388	1,510	2,898
July	67	195	119	158	31	570	1,864	1,442	3,306
August	79	151	95	59	8	391	1,242	1,337	2,579
September	67	204	57	86	14	428	1,004	1,050	2,054
October	103	211	126	69	6	515	1,166	2,085	3,251
November	83	156	99	84	4	426	1,061	1,820	2,881
December	111	208	113	79	5	516	1,226	2,255	3,481
Totals, 1950	828	2,050	1,108	805	378	5,168	13,759	16,599	30,358
Totals, 1949	514	1,547	988	353	80	3,482	10,184	10,344	20,528
Totals, 1948	681	2,300	1,247	241	58	4,327	13,625	12,959	26,401
Totals, 1947	500	2,223	1,238	290	55	4,306	12,026	9,844	21,870
Totals, 1946	604	1,931	1,028	525	48	4,136	9,113	7,300	16,413
Totals, 1945	569	1,193	693	684	75	3,214	6,495	6,701	13,196
Totals, 1944	442	889	459	544	46	2,380	4,159	4,983	9,142
Totals, 1943	356	937	396	293	93	2,075	4,009	3,448	7,457
Totals, 1942	329	868	359	111	73	1,740	*	*	*
Totals, 1941	247	1,087	468	150	70	2,022	*	*	*
Totals for ten-year period	5,070	15,025	7,984	3,996	976	32,850	73,370	72,178	145,365
Average for ten-year period	507	1,503	798	400	98	3,285	9,171†	9,022†	18,171†

* No record kept prior to 1943. † Average for eight-year period only.

(27) CROWN-GRANTED TIMBER LANDS PAYING FOREST PROTECTION TAX

Year	Area (Acres)	Year	Area (Acres)
1921	845,111	1936	515,924
1922	887,980	1937	743,109
1923	883,344	1938	754,348
1924	654,668	1939	719,112
1925	654,016	1940	549,250
1926	688,372	1941	543,632
1927	690,438	1942	527,995
1928	671,131	1943	543,044
1929	644,011	1944	571,308
1930	629,156	1945	591,082
1931	602,086	1946	601,148
1932	552,007	1947	596,900
1933	567,731	1948	571,439
1934	557,481	1949	597,790
1935	535,918	1950	631,967

(28) ACREAGE OF TIMBER LAND BY ASSESSMENT DISTRICTS

	Acres		Acres
Alberni	95,704	Omineca	160
Comox	139,720	Prince George	1,193
Cowichan	108,285	Prince Rupert	21,272
Fort Steele	8,830	Revelstoke	33,179
Gulf Islands	240	Slocan	35,608
Kettle River	315	Vancouver	74
Nanaimo	135,162	Victoria	50,228
Nelson	1,997		

(29) ACREAGE OF CROWN-GRANTED TIMBER LANDS PAYING FOREST PROTECTION TAX AS COMPILED FROM TAXATION RECORDS

Year	Acreage Assessed as Timber Land	Coast		Interior	
		Logged	Timber	Logged	Timber
		Acres	Acres	Acres	Acres
1936	766,186	92,892	352,582	152,846	167,866
1937	766,413	96,598	363,693	153,566	152,556
1938	756,328	106,833	344,858	157,508	147,129
1939	719,111	89,209	338,794	153,032	138,075
1940	549,250	103,486	338,419	24,852	82,493
1941	543,633	105,541	335,468	26,016	76,608
1942	527,995	112,834	322,306	20,072	72,781
1943	543,044	125,313	325,996	20,205	71,529
1944	571,308	134,194	345,378	20,816	70,920
1945	591,082	142,504	357,037	21,536	70,005
1946	601,148	146,331	364,556	23,125	67,136
1947	596,900	153,072	354,207	26,591	63,030
1948	571,439	158,120	326,738	25,485	61,096
1949	597,790	172,024	340,200	30,625	54,941
1950	631,967	207,308	378,985	8,635	37,039

FOREST REVENUE

	Twelve Months to Dec. 31, 1950	Twelve Months to Dec. 31, 1949	Twelve Months to Dec. 31, 1948	Twelve Months to Dec. 31, 1947	Twelve Months to Dec. 31, 1946	Ten-year Average, 1941–50
Timber-licence rentals	$371,315.21	$380,591.52	$384,617.93	$385,167.77	$400,523.71	$397,419.34
Timber-licence transfer fees	1,925.00	1,380.00	1,855.00	2,635.00	4,205.00	1,931.00
Timber-licence penalty fees	2,375.37	2,319.96	2,915.66	3,682.77	4,357.94	8,033.89
Hand-loggers' licence fees	100.00	175.00	100.00	150.00	75.00	192.50
Timber-lease rentals	49,350.35	50,025.01	49,955.78	51,113.07	51,079.41	50,629.60
Timber-lease penalty fees	9.69	79.28	33.52	119.48	60.73	60.92
Timber-sale rentals	99,324.36	96,808.74	95,180.53	77,234.35	62,881.12	65,362.85
Timber-sale stumpage	6,076,647.78	4,828,104.08	4,191,699.20	3,064,011.37	1,892,216.67	2,582,974.46
Timber-sale cruising	48,666.62	29,988.99	38,233.16	27,444.06	24,571.66	24,339.35
Timber-sale advertising	7,491.70	5,406.60	7,652.90	5,988.95	5,297.25	4,610.36
Timber royalty and tax	2,441,916.35	2,709,046.42	3,190,078.92	2,834,159.55	2,198,637.87	2,386,089.90
Scaling expenses (not Scaling Fund)	4,505.84	3,424.18	2,588.03	1,713.19	1,161.05	2,227.08
Trespass stumpage	----------	----------	----------	100,710.23	48,405.37	30,598.19
Scalers' examination fees	----------	----------	----------	1,095.00	985.00	366.50
Exchange	129.36	130.05	78.77	65.40	42.93	110.37
Seizure expenses	710.11	1,013.91	726.18	1,046.24	1,779.06	818.37
General miscellaneous	30,797.51	24,141.30	26,140.16	18,269.63	14,588.67	15,514.60
Timber-berth rentals and bonus	20,275.30	20,784.50	20,043.13	20,154.36	20,823.00	20,909.91
Interest on timber-berth rentals and bonus	4.85	12.24	14.35	7.53	18.73	42.55
Transfer fees on timber berths	83.67	104.45	35.66	133.11	131.00	98.92
Grazing fees and interest	74,358.08	28,324.74	27,106.19	29,293.74	31,412.24	34,426.95
Totals	$9,229,987.15	$8,181,860.97	$8,039,055.07	$6,624,194.80	$4,763,253.41	$5,626,757.61

(31)

AMOUNTS CHARGED AGAINST LOGGING OPERATIONS, 1950

District	Royalty	Tax	Trespass Stumpage	Seizure Expenses	Government Scaling Expenses	Scaling Fund		Stumpage	Rentals, Cruising, Advertising, Transfer Fees	Stumpage Reservations	Silviculture Fund	Total
						Expenses	Fees					
Vancouver	$1,907,133.69	$14,581.32	.....	$446.10	$791.85	$97,149.74	$361,337.45	$3,497,270.72	$94,484.88	$2,228.15	.....	$5,975,423.90
Prince Rupert	224,446.94	2,207.58	.....	39.00	518.50	3,405.56	15,607.82	486,688.27	42,570.19	341.56	$83,133.10	858,958.52
Fort George	63,963.55	.....	.....	30.81	263.45	.....	.....	860,616.68	33,184.19	1,282.13	247,642.70	1,206,983.51
Kamloops	143,452.75	3,778.85	.....	137.80	2,442.30	.....	.....	801,544.76	46,813.53	144.55*	196,430.31	1,194,455.75
Nelson	103,766.71	3,196.84	.....	79.47	855.48	.....	.....	615,421.75	36,433.25	192.63*	167,742.71	927,303.58
Totals, 1950	$2,442,763.64	$23,764.59	.....	$733.18	$4,871.58	$100,555.30	$376,945.27	$6,261,542.18	$253,486.04	$3,514.66	$694,948.82	$10,163,125.26
Totals, 1949	$2,577,770.96	$47,469.51	.....	$1,128.73	$4,943.46	$94,588.60	$295,075.36	$4,946,698.82	$210,112.24	$821.23*	$478,602.29	$8,655,568.74
Totals, 1948	$3,137,060.09	$36,807.32	.....	$611.36	$3,437.13	$78,846.92	$305,961.62	$4,476,410.64	$246,342.89	$2,681.96	$314,660.90	$8,602,220.83
Totals, 1947	$2,984,978.60	$20,944.06	$123,345.94	$1,227.84	$2,717.46	$63,361.93	$308,652.88	$3,331,244.16	$163,659.81	.....	.....	$7,000,132.68
Totals, 1946	$2,162,183.55	$15,829.93	$51,050.81	$1,815.77	$1,179.85	$43,796.85	$167,064.09	$1,855,151.90	$99,687.89	.....	.....	$4,397,760.64
Totals, 1945	$1,955,757.26	$10,986.85	$48,943.70	$904.56	$1,523.77	$40,280.68	$125,088.36	$1,577,898.98	$73,927.60	.....	.....	$3,835,311.76
Totals, 1944	$1,959,140.27	$11,668.31	$54,647.11	$785.43	$4,450.77	$40,029.30	$128,880.33	$1,395,646.55	$96,626.44	.....	.....	$3,691,874.51
Totals, 1943	$1,860,127.27	$9,283.99	$36,769.22	$353.96	$3,274.72	$33,369.74	$118,265.63	$1,082,866.31	$85,858.24	.....	.....	$3,230,169.08
Totals, 1942	$1,975,067.18	$57,125.20	$19,489.98	$331.56	$1,017.17	$36,944.89	$122,731.57	$949,463.02	$71,684.25	Gov't Scaling Fees $268.50		$3,234,123.32
Totals, 1941	$2,368,592.99	$100,732.39	$22,424.64	$481.18	$588.26	$38,359.49	$147,441.90	$843,116.13	$64,178.18	$392.44		$3,586,307.60
Ten-year average, 1941–50	$2,342,344.18	$33,461.22	$35,667.14	$837.36	$2,800.42	$57,013.37	$209,610.70	$2,672,003.87	$136,556.36	.....		$5,639,659.44

* Credit.

Amounts Charged against Logging Operations, Fiscal Year 1949–50

District	Royalty	Tax	Trespass Stumpage	Seizure Expenses	Government Scaling Expenses	Scaling Fund		Stumpage	Rentals, Cruising, Advertising, Transfer Fees	Stumpage Reservations	Silviculture Fund	Total
						Expenses	Fees					
Vancouver	$1,945,674.71	$34,306.85	.....	$412.45	$1,158.86	$86,045.16	$273,321.71	$2,880,081.58	$68,010.97	$307.41*	.....	$5,288,704.88
Prince Rupert	218,998.47	4,105.80	.....	18.00	906.50	6,149.88	14,796.64	398,050.09	40,118.57	108.16*	$57,236.68	740,272.47
Fort George	62,041.08	.....	.....	63.00	426.50	.....	.....	538,363.05	23,846.78	609.01*	154,898.20	779,029.60
Kamloops	146,491.89	5,524.59	.....	218.83	2,370.10	.....	.....	598,956.87	44,078.10	1,073.50*	133,674.05	930,240.93
Nelson	122,637.59	3,853.84	.....	220.06	489.58	.....	.....	535,247.91	33,625.81	76.94*	136,999.25	832,997.10
Totals, 1949–50	$2,495,843.74	$47,791.08	.....	$932.34	$5,351.54	$92,195.04	$288,118.35	$4,950,699.50	$209,680.23	$2,175.02*	$482,808.18	$8,571,244.98
Totals, 1948–49	$3,031,177.07	$37,722.35	.....	$724.75	$3,485.69	$76,559.44	$286,340.73	$4,564,284.78	$262,403.83	$1,732.56*	$381,505.04	$8,642,471.12
Totals, 1947–48	$2,932,284.42	$22,450.07	$92,695.98	$1,260.50	$2,695.01	$70,073.76	$320,438.04	$3,123,738.93	$196,341.75	$3,787.01	$53,260.31	$6,819,025.78
Totals, 1946–47	$2,509,322.95	$18,176.08	$85,269.80	$1,425.15	$2,265.58	$44,310.81	$190,607.89	$1,999,259.67	$142,390.02	.....	.....	$4,993,027.95
Totals, 1945–46	$2,029,589.74	$11,512.06	$56,860.04	$1,082.57	$1,058.56	$49,358.67	$123,522.07	$1,687,500.72	$80,116.11	.....	.....	$4,040,600.54
Totals, 1944–45	$1,935,830.66	$11,705.96	$50,718.61	$878.73	$4,036.46	$40,496.75	$126,724.56	$1,421,693.72	$73,308.83	.....	.....	$3,665,394.28
Totals, 1943–44	$1,952,728.39	$8,425.35	$42,192.20	$361.46	$3,675.98	$35,758.31	$127,794.46	$1,155,680.34	$92,080.19	.....	.....	$3,418,696.68
Totals, 1942–43	$1,839,621.14	$55,929.45	$21,752.85	$343.56	$1,392.68	$34,517.65	$113,543.55	$955,483.46	$75,037.47	Gov't Scaling Fees $231.63		$3,097,853.44
Totals, 1941–42	$2,310,473.38	$92,980.09	$22,970.78	$421.18	$756.06	$37,798.34	$142,180.70	$879,697.43	$65,137.56	$420.20		$3,552,835.72
Totals, 1940–41	$2,170,897.94	$84,995.42	$14,452.13	$460.20	$305.75	$35,777.90	$144,686.32	$728,543.90	$54,942.02	$459.47		$3,235,521.05
Ten-year average, 1940–41 to 1949–50	$2,320,776.94	$39,168.79	$38,691.24	$789.04	$2,502.33	$51,684.67	$186,395.67	$2,146,658.24	$125,143.80	.....		$5,003,667.15

* Credit.

(33)

Forest Revenue, Fiscal Year 1949–50

		Ten-year Average
Timber-licence rentals	$381,549.18	$401,524.81
Timber-licence transfer fees	580.00	1,883.50
Timber-licence penalty fees	2,667.11	8,987.46
Hand-loggers' licence fees	100.00	205.00
Timber-lease rentals	49,345.35	51,032.22
Timber-lease penalty fees and interest	18.53	80.74
Timber-sale rentals	95,617.36	60,322.60
Timber-sale stumpage	5,047,235.22	2,137,036.09
Timber-sale cruising	30,897.29	21,358.47
Timber-sale advertising	5,399.20	4,114.98
Timber royalty	2,596,583.85	2,321,387.23
Timber tax	47,603.93	32,479.02
Scaling fees (not Scaling Fund)		114.14
Scaling expenses (not Scaling Fund)	3,810.92	502.87
Trespass stumpage*		31,810.48
Scalers' examination fees†		389.00
Exchange	111.81	108.35
Seizure expenses	846.44	784.48
General miscellaneous	25,246.92	12,944.23
Timber-berth rentals, bonus, and fees	16,926.02	20,973.20
Interest on timber-berth rentals	11.71	58.74
Transfer fees on timber berths	96.45	132.69
Grazing fees and interest	26,849.90	30,346.85
	$8,331,497.19	$5,138,627.15
Taxation from Crown-granted timber lands	445,632.68	269,502.45
Totals	$8,777,129.87	$5,408,129.60

* Trespass penalties now included in timber-sale stumpage.
† Scalers' examination fees now included in general miscellaneous.

(34)

Forest Expenditure, Fiscal Year 1949–50

Forest District	Salaries	Expenses	Total
Forest Service Marine Station	.....	$33,824.37	$33,824.37
Vancouver	$195,410.01	62,005.73	257,415.74
Prince Rupert	98,592.93	25,562.00	124,154.93
Prince George	90,046.76	20,040.52	110,087.28
Kamloops	166,737.39	28,613.71	195,351.10
Nelson	153,962.78	32,470.28	186,433.06
Victoria	349,731.95	214,504.66	564,236.61
Totals	$1,054,481.82	$417,021.27	$1,471,503.09
Canadian Forestry Association			4,000.00
Forest management			87,092.68
Forest research			29,715.95
Reforestation			365,553.17
Public relations			43,772.30
Provincial parks			462,516.50
Ranger School			50,973.48
Refund to United Kingdom			4,033.80
Grazing Range Improvement Fund*			13,424.95
Forest Protection Fund*			2,000,000.00
Forest Reserve Account*			230,251.70
Grand total			$4,762,837.62

* Contributions from Treasury to special funds detailed elsewhere.

(35)

Scaling Fund

Balance, April 1st, 1949 (debit)	$75,624.14
Collections, fiscal year 1949–50	378,241.52
	$302,617.38
Expenditures, fiscal year 1949–50	397,087.93
Balance, March 31st, 1950 (debit)	$94,470.55
Collections, nine months, April to December, 1950	413,375.16
	$318,904.61
Expenditures, nine months, April to December, 1950	334,734.15
Balance, December 31st, 1950 (debit)	$15,829.54

(36)

Silviculture Fund

Balance forward, April 1st, 1949	$364,982.33
Collections, fiscal year 1949–50	521,661.06
	$886,643.39
Expenditures, fiscal year 1949–50	166,000.96
Balance, March 31st, 1950	$720,642.43
Balance, April 1st, 1950	$720,642.43
Collections, nine months to December 31st, 1950	533,180.75
	$1,253,823.18
Expenditures, nine months to December 31st, 1950	176,634.05
Balance, December 31st, 1950 (credit)	$1,077,189.13

(37)

Forest Reserve Account

Credit balance brought forward, April 1st, 1949	$561,677.22
Amount received from Treasury, March 31st, 1950 (under subsection (2), section 32, "Forest Act")	230,251.70
Moneys received under subsection (4), section 32, "Forest Act"	----------
	$791,928.92
Expenditures, April 1st, 1949, to March 31st, 1950	199,490.18
Credit balance, March 31st, 1950	$592,438.74
Expenditures, nine months to December 31st, 1950	235,354.71
Balance, December 31st, 1950 (credit)	$357,084.03

(38)

Grazing Range Improvement Fund

Balance, April 1st, 1949 (credit)	$27,626.91
Government contribution (section 14, "Grazing Act")	14,659.15
Other collections	98.50
	$42,384.56
Expenditures, April 1st, 1949, to March 31st, 1950	15,638.85
Balance, March 31st, 1950 (credit)	$26,745.71
Government contribution (section 14, "Grazing Act")	13,424.95
Other collections	----------
	$40,170.66
Expenditures, April 1st, 1950, to December 31st, 1950	20,328.70
Balance, December 31st, 1950 (credit)	$19,841.96

(39)

FOREST PROTECTION FUND

Balance, April 1st, 1949			$563,083.44
Expenditure		$1,904,957.61	
Less refunds		32,593.68	
			1,872,363.93
			$1,309,280.49
(*See* detailed summary of net expenditure on page 122.)			
Government contribution		$2,000,000.00	
Collections, tax		321,771.98	
Collections, slash and snags	$35,412.83		
Less refunds	15,957.11		
		19,455.72	
			2,341,227.70
Balance, March 31st, 1950			$1,031,947.21
Balance, April 1st, 1950			$1,031,947.21
Expenditure, nine months, April to December, 1950		$1,537,724.09	
Repayable to votes (approximately)		418,795.43	
			1,956,519.52
			$924,572.31
Collection, tax		$223,291.30	
Collections, miscellaneous		15,966.53	
Refunds of expenditure		20,533.38	
Government contribution		1,500,000.00	
			1,759,791.21
Estimated balance, December 31st, 1950			$835,218.90

Forest-protection Expenditure for Twelve Months Ended March 31st, 1950, by the Forest Service

District	Salaries and Expenses		Tools and Equipment		Fires	Improvements	Aircraft	Hazard Reduction	Planning and Research	Miscellaneous	Total
	Permanent	Temporary	New	Maintenance and Operation							
Forest Service Marine Station	.....	$150.62	$17,161.59	$50,295.78	.....	$86,189.66	.....	.....	.....	$3,176.49	$156,974.14
Vancouver	$57,083.20	122,105.29	56,122.28	64,777.43	$16,361.99	23,313.26	.....	.....	.....	7,161.70	346,925.15
Prince Rupert	19,828.24	44,321.38	20,401.67	18,923.41	560.77	16,581.19	$1,170.01	$1,177.50	.....	3,207.72	126,171.89
Prince George	19,621.52	66,591.39	36,982.13	28,262.65	19,540.16	19,417.85	17,604.20	.....	.....	5,274.46	213,294.36
Kamloops	34,039.60	118,473.74	46,392.56	47,591.72	26,621.67	68,337.11	22,896.52	2,040.85	.....	8,526.78	374,920.55
Nelson	36,389.17	138,108.77	73,620.05	60,204.49	31,559.69	91,111.61	21,303.74	6,204.32	.....	6,878.67	465,380.51
Victoria	90,722.46	14,275.61	23,183.02	21,032.70	.....	.....	21,150.16	.....	$10,854.24	7,479.14	188,697.33
Totals	$257,684.19	$504,026.80	$273,863.30	$291,088.18	$94,644.28	$304,950.68	$84,124.63	$9,422.67	$10,854.24	$41,704.96	$1,872,363.93

(41) REPORTED APPROXIMATE EXPENDITURE IN FOREST PROTECTION BY OTHER AGENCIES, 1950

Forest District	Expenditures				
	Patrols and Fire-prevention	Tools and Equipment	Fires	Improvements	Total
Vancouver	$184,132.00	$171,764.00	$162,901.00	$23,421.00	$542,218.00
Prince Rupert	5,949.00	10,155.00	2,658.08	.....	18,762.08
Fort George	.....	.....	16,473.40	.....	16,473.40
Kamloops	.....	.....	4,426.40	.....	4,426.40
Nelson	6,430.00	15,389.00	9,028.01	11,336.93	42,183.94
Totals	$196,511.00	$197,308.00	$195,486.89	$34,757.93	$624,063.82
Ten-year average, 1941–50	$90,420.06	$131,507.42	$163,226.71	$10,510.44	$395,664.63

(42) SUMMARY OF SNAG-FALLING, 1950, VANCOUVER FOREST DISTRICT

		Acres
Total area logged, 1950		75,503
Logged in snag-exempted zone*	702	
Logged on small exempted operations*	1,904	
	2,606	
Assessed for non-compliance, *less* 185 acres subsequently felled	692	
		3,298
Balance logged acres snagged, 1950		72,205

* Exemption granted under subsection (3), section 113, " Forest Act."

(43) SUMMARY OF LOGGING SLASH CREATED, 1950, VANCOUVER FOREST DISTRICT

		Acres
Total area logged, 1950		75,503
Area covered by full hazard reports	52,402	
Covered by snag reports but exempted from slash-disposal*	795	
Covered by acreage reports only (exempted from slash and snag disposal)*	2,606	
		55,803
Slash created too late to be dealt with in 1950		19,700

* Exemption granted under subsection (3), section 113, " Forest Act."

(44) ACREAGE ANALYSIS OF SLASH-DISPOSAL REQUIRED, 1950, VANCOUVER FOREST DISTRICT

	Acres of Slash Prior to 1950	Acres of Slash 1950	Total Acres
Broadcast-burning	14,395	16,522	30,917
Spot-burning	6,347	10,545	16,892
Totals	20,742	27,067	47,809
1950 reports not recommending slash-disposal			25,335
1950 slash examined for snags but exempt from slash-disposal			795
1950 slash in zone completely exempted		702	
1950 slash on very small operations exempted without special examination		1,904	
			2,606
Total area of slash dealt with, 1950			76,545

NOTE.—Above table does not include the estimated 19,700 acres (*see* Table No. 43) created too late to be dealt with in 1950.

(45) ANALYSIS OF PROGRESS IN SLASH-DISPOSAL, 1950, VANCOUVER FOREST DISTRICT

				Acres
Total disposal required (*see* Table No. 44)				47,809
Type of Disposal	Acres of Slash Prior to 1950	Acres of Slash 1950	Total Acres	
Spring broadcast-burning	346	121	467	
Fall broadcast-burning	8,809	9,159	17,968	
Spot-burning	3,370	3,234	6,604	
Total burning completed	12,525	12,514	25,039	
Burned by accidental fires		1,700	1,700	
Lopping, scattering, land-clearing, etc.		350	350	
Totals	12,525	14,564		27,089
Balance reported slash not yet abated				20,720
Slash created prior to 1950—acres assessed			4,010	
Slash created 1950—acres assessed			107	
				4,117
Remainder waiting final disposition, 1951				16,603
Plus slash created too late to be dealt with, 1950				19,700
Total area of slash carried over to 1951 for disposition				36,303

(46) SUMMARY OF OPERATIONS, 1950, VANCOUVER FOREST DISTRICT

Total operations, Vancouver Forest District		1,434
Intentional slash-burns	185	
Operations on which slash was disposed of by lopping, scattering, land-clearing, etc.	37	
Operations on which slash was accidentally burned	54	
Operations not required to burn	691	
Operations given further time for disposal	14	
Operations granted total exemption under subsection (3), section 113, "Forest Act"	277	
Operations where compensation assessed or security deposit posted	12	
Operations in snag-falling only area	55	
Operations pending decision *re* assessment or further time for disposal	109	
		1,434

NOTE.—All inactive operations omitted from Table No. 46.

(47) SUMMARY OF SLASH-BURN DAMAGE AND COSTS, 1950, VANCOUVER FOREST DISTRICT

Total acres of forest-cover burned in slash fires, 1950	823
Net damage to forest-cover	$6,606.00
Net damage to cut products	62,610.00
Net damage to equipment and property	40,063.00
Total damage	$109,279.00

Cost of Slash-burning as Reported by Operators

	Total Cost	Acres	Cost per M B.M.*
(*a*) Spring broadcast-burning	$1,550.00	467	8c.
(*b*) Fall broadcast-burning	40,402.00	17,965	5½c.
(*c*) Spot-burning	12,060.00	6,604	6c.

*(*a*) and (*b*) Based on volume of 40 M B.M. per acre; (*c*) based on volume of 30 M B.M. per acre.

(48)

RECAPITULATION SLASH-DISPOSAL, 1934–50.

Year	Acres of Slash Burned Accidentally	Acres of Slash Burned Intentionally
1934	4,927	15,935
1935	11,783	13,239
1936	1,340	7,691
1937	3,015	27,516
1938	35,071	50,033
1939	1,930	51,603
1940	2,265	33,034
1941	3,385	5,524
1942	4,504	80,226
1943	2,046	40,013
1944	5,121	27,278
1945	3,897	46,467
1946	2,174	25,498
1947	2,663	34,414
1948	2,215	30,652
1949	1,468	53,543
1950	1,700	25,389

(49)

FIRE OCCURRENCES BY MONTHS, 1950

Forest District	March	April	May	June	July	August	September	October	Total	Per Cent
Vancouver	.....	.....	45	83	126	65	69	2	390	25.74
Prince Rupert	.....	4	7	23	7	8	3	1	53	3.50
Fort George	3	2	13	61	38	16	32	.....	165	10.89
Kamloops	.....	4	56	99	141	82	145	4	531	35.05
Nelson	.....	3	42	51	126	76	77	1	376	24.82
Totals	3	13	163	317	438	247	326	8	1,515	100.00
Per cent	0.20	0.86	10.76	20.92	28.91	16.30	21.52	0.53	100.00	.....
Ten-year average, 1941–50	3	48	188	170	491	397	167	8	1,472	.....
Per cent	0.20	3.26	12.77	11.55	33.36	26.97	11.35	0.54	100.00	.....

(50)

NUMBER AND CAUSES OF FOREST FIRES, 1950

Forest District	Lightning	Campers	Railways Operating	Smokers	Brush-burning (Not Railway-clearing)	Road and Power- and Telephone-line Construction	Industrial Operation	Incendiarism	Miscellaneous (Known Causes)	Unknown Causes	Total	Per Cent of Total Fires in Province
Vancouver	23	33	93	108	15	3	54	3	55	3	390	25.74
Prince Rupert	11	14	4	7	2	.....	7	1	7	.....	53	3.50
Fort George	40	41	6	10	23	18	12	.....	12	3	165	10.89
Kamloops	121	130	55	80	17	2	14	1	97	14	531	35.05
Nelson	147	33	39	86	20	2	7	2	25	15	376	24.82
Totals	342	251	197	291	77	25	94	7	196	35	1,515	100.00
Per cent	22.57	16.57	13.00	19.21	5.08	1.65	6.21	0.46	12.94	2.31	100.00	.....
Ten-year average, 1941–50	472	187	229	269	63	13	49	13	145	32	1,472	.....
Per cent	32.07	12.70	15.56	18.28	4.28	0.88	3.33	0.88	9.85	2.17	100.00	.....

(51) NUMBER AND CAUSES OF FOREST FIRES FOR THE LAST TEN YEARS

Causes	1950	1949	1948	1947	1946	1945	1944	1943	1942	1941	Total
Lightning	342	487	266	326	515	541	408	256	704	871	4,716
Campers	251	215	105	193	263	183	203	157	158	142	1,870
Railways operating	197	325	113	270	231	426	329	216	114	73	2,294
Smokers	291	281	140	245	326	356	342	304	220	184	2,689
Brush-burning (not railway-clearing)	77	60	39	51	117	69	51	58	30	81	633
Road and power- and telephone-line construction	25	20	5	8	16	5	10	8	31	4	132
Industrial operations	94	87	45	53	38	32	51	20	38	33	491
Incendiarism	7	13	5	13	10	32	13	7	5	20	125
Miscellaneous (known causes)	196	169	58	144	159	155	210	136	90	134	1,451
Unknown causes	35	44	23	29	32	39	50	23	24	19	318
Totals	1,515	1,701	799	1,332	1,707	1,838	1,667	1,185	1,414	1,561	14,719

(52) FIRES CLASSIFIED BY SIZE AND DAMAGE, 1950

Forest District	Total Fires		Under ¼ Acre			¼ to 10 Acres			Over 10 to 500 Acres			Over 500 Acres in Extent			Damage		
	Number	Per Cent of Total Fires in Province	Number	Per Cent of Total Fires in District	Per Cent of Total Fires in This Class	Number	Per Cent of Total Fires in District	Per Cent of Total Fires in This Class	Number	Per Cent of Total Fires in District	Per Cent of Total Fires in This Class	Number	Per Cent of Total Fires in District	Per Cent of Total Fires in This Class	Under $100	Between $100 and $1,000	Over $1,000
Vancouver	390	25.74	271	69.49	33.09	93	23.84	19.50	26	6.67	14.86	.....	.....	.....	367	7	16
Prince Rupert	53	3.50	27	50.94	3.30	14	26.42	2.93	10	18.87	5.71	2	3.77	4.55	46	6	1
Fort George	165	10.89	78	47.27	9.52	30	18.18	6.29	24	14.55	13.71	33	20.00	75.00	120	23	22
Kamloops	531	35.05	180	33.90	21.98	234	44.07	49.06	109	20.53	62.29	8	1.50	18.18	498	26	7
Nelson	376	24.82	263	69.95	32.11	106	28.19	22.22	6	1.60	3.43	1	0.26	2.27	370	4	2
Totals	1,515	100.00	819	.....	100.00	477	.....	100.00	175	.....	100.00	44	.....	100.00	1,401	66	48
Per cent	100.00	.....	54.06	.....	.....	31.49	.....	.....	11.55	.....	.....	2.90	.....	.....	92.47	4.36	3.17
Ten-year average, 1941–50	1,472	.....	825	.....	.....	431	.....	.....	173	.....	.....	43	.....	.....	1,369	67	36
Per cent	100.00	.....	56.05	.....	.....	29.28	.....	.....	11.75	.....	.....	2.92	.....	.....	93.00	4.55	2.45

(53) DAMAGE TO PROPERTY OTHER THAN FORESTS, 1950*

Forest District	Forest Products in Process of Manufacture	Buildings	Railway and Logging Equipment	Miscellaneous	Total	Per Cent of Total
Vancouver	$105,786.65	$1,501.00	$218,966.90	$7,184.80	$333,439.35	80.70
Prince Rupert	4,050.00	4,500.00	20,000.00	65.50	28,615.50	6.92
Fort George	703.70	10,800.00	1,400.00	24,350.00	37,253.70	9.02
Kamloops	3,608.20	1,660.00	1,683.15	5,903.38	12,854.73	3.11
Nelson	126.25	405.00	.....	500.00	1,031.25	0.25
Totals	$114,274.80	$18,866.00	$242,050.05	$38,003.68	$413,194.53	100.00
Per cent	27.66	4.56	58.58	9.20	100.00	.....
Ten-year average, 1941–50	$99,866.40	$16,731.25	$113,949.25	$29,871.55	$260,418.45	.....
Per cent	38.35	6.42	43.76	11.47	100.00	.....

* Does not include intentional slash-burns. (For this item *see* page 125.)

(54) DAMAGE TO FOREST-COVER CAUSED BY FOREST FIRES, 1950—PART I*

Forest District	Accessible Merchantable Timber				Inaccessible Merchantable Timber			Immature Timber	
	Net Area Killed	Total Volume Killed	Salvable Volume of Timber Killed	Net Stumpage Loss	Net Area Killed	Total Volume Killed	Damage	Net Area Killed	Present Value
	Acres	M B.M.	M B.M.	$	Acres	M B.M.	$	Acres	$
Vancouver	264	3,139	1,020	7,385	26	520	.....	972	7,091
Prince Rupert	512	1,060	508	616	.....	.....	.....	122	726
Fort George	2,150	9,892	5,933	14,990	6	6	22	53,761	122,974
Kamloops	2,144	1,336	344	3,752	281	1,921	6,437	5,091	6,228
Nelson	134	8	.....	1,300	.....	.....	.....	1,038	3,082
Totals	5,204	15,435	7,805	28,043	313	2,447	6,459	60,984	140,101
Per cent	0.61	86.32	50.57	7.80	0.04	13.68	1.80	7.19	38.98
Ten-year average, 1941–50	22,139	119,794	18,214	173,164	1,567	5,767	5,391	50,489	148,573
Per cent	6.55	95.41	15.20	44.63	0.47	4.59	1.39	14.94	38.30

* Does not include intentional slash-burns. (For this item *see* page 125.)

(54) DAMAGE TO FOREST-COVER CAUSED BY FOREST FIRES, 1950—PART II*

Forest District	Not Satisfactorily Restocked				Non-commercial Cover		Grazing or Pasture Land		Non-productive Sites		Grand Totals		
	Logged Unburned	Logged and Burned	Burned, Not Logged	Damage	Area Burned	Damage	Area Burned	Damage	Area Burned	Damage	Area	Quantity	Damage
	Acres	Acres	Acres	$	Acres	$	Acres	$	Acres	$	Acres	M B.M.	$
Vancouver	1,683	787	80	721	505	216	41	11	252	69	4,610	3,659	15,493
Prince Rupert	696	25	13,132	36,490	35	109	6	.....	13	3	14,541	1,060	37,944
Fort George	2,290	1	2,920	6,893	456,618	114,174	263,015	13,151	28,275	7,068	809,036	9,898	279,272
Kamloops	486	296	2,187	2,795	2,334	738	4,428	222	690	169	17,937	3,257	20,341
Nelson	67	5	81	1,790	18	4	16	1	763	190	2,122	8	6,367
Totals	5,222	1,114	18,400	48,689	459,510	115,241	267,506	13,385	29,993	7,499	848,246	17,882	359,417
Per cent	0.61	0.13	2.17	13.55	54.17	32.06	31.54	3.72	3.54	2.09	100.00	100.00	100.00
Ten-year average, 1941–50	4,700	2,613	24,474	14,183	111,660	30,111	53,979	3,235	66,342	13,314	337,963	125,561	387,971
Per cent	1.39	0.77	7.24	3.66	33.04	7.76	15.97	0.83	19.63	3.43	100.00	100.00	100.00

* Does not include intentional slash-burns. (For this item *see* page 125.)

(55) FIRE CAUSES, AREA BURNED, FOREST SERVICE COST, AND TOTAL DAMAGE, 1950

Causes	Number	Per Cent	Acres	Per Cent	Cost	Per Cent	Damage	Per Cent
Lightning	342	22.57	36,851	4.34	$46,211.89	32.62	$85,097.41	11.01
Campers	251	16.57	527,277	62.16	36,245.56	25.58	203,171.63	26.30
Railways operating	197	13.00	800	0.09	971.56	0.69	5,938.73	0.77
Smokers	291	19.21	5,307	0.63	27,535.69	19.43	227,623.86	29.46
Brush-burning (not railway-clearing)	77	5.08	231,976	27.35	6,917.93	4.88	51,054.01	6.61
Road and power- and telephone-line construction	25	1.65	128	0.02	230.75	0.16	467.00	0.06
Industrial operations	94	6.21	1,504	0.18	6,407.62	4.52	154,222.94	19.96
Incendiarism	7	0.46	883	0.10	3,172.24	2.24	3,712.67	0.48
Miscellaneous (known causes)	196	12.94	43,061	5.08	6,696.51	4.73	33,373.23	4.32
Unknown causes	35	2.31	459	0.05	7,298.79	5.15	7,950.05	1.03
Totals	1,515	100.00	848,246	100.00	$141,688.54	100.00	$772,611.53	100.00

(56) COMPARISON OF DAMAGE CAUSED BY FOREST FIRES IN LAST TEN YEARS

	1950	1949	1948	1947	1946	1945	1944	1943	1942	1941	Total, Ten Years
Total number of fires	1,515	1,701	799	1,332	1,707	1,838	1,667	1,185	1,414	1,561	14,719
Area burned (acres)	848,246	145,549	384,356	142,765	303,395	352,892	506,148	94,842	446,544	154,888	3,379,625
Standing timber destroyed or damaged (M ft. B.M.)	17,882	7,617	31,265	11,017	69,119	534,502	98,075	15,612	128,890	341,636	1,255,615
Amount salvable (M ft. B.M.)	7,805	1,518	13,678	3,846	16,150	120,021	10,937	719	4,341	3,123	182,138
Damage to forests	$359,417	$32,449	$287,192	$62,497	$191,669	$1,092,537	$448,180	$63,731	$859,037	$483,002	$3,879,711
Damage to other forms of property	413,194	326,848	284,271	246,737	166,315	350,516	204,345	69,196	477,459	65,303	2,604,184
Total damage	$772,611	$359,297	$571,463	$309,234	$357,984	$1,443,053	$652,525	$132,927	$1,336,496	$548,305	$6,483,895

(57) FIRES CLASSIFIED BY FOREST DISTRICT, PLACE OF ORIGIN, AND COST PER FIRE OF FIRE-FIGHTING, 1950

Forest District	Total Fires	Originated on Vacant Crown Lands and Lands Contributing to Forest Protection Fund	Originated on Lands Not Contributing to Forest Protection Fund	Total Forest Service Cost			Extinguished without Cost			Cost Money to Extinguish							
				Dollars	Per Cent	Average Expenditure per Cost Fire (Dollars)	Number	Per Cent of Total Fires in District	Per Cent of Total Fires in Province	Number	Per Cent of Total Fires in District	Per Cent of Total Fires in Province	Cost less than $100 per Fire	Cost $100 to $1,000 per Fire	Cost over $1,000 to $5,000 per Fire	Cost over $5,000 to $10,000 per Fire	Cost over $10,000 per Fire
Vancouver	390	105	285	18,806.29	13.27	125.38	240	61.54	32.65	150	38.46	19.23	84	51	7	4	4
Prince Rupert	53	23	30	8,791.89	6.21	338.15	27	50.94	3.68	26	49.06	3.33	18	6	1	1	.....
Fort George	165	129	36	33,003.57	23.29	358.73	73	44.24	9.93	92	55.76	11.80	61	24	6	.....	1
Kamloops	531	435	96	51,438.17	36.30	207.41	283	53.30	38.50	248	46.70	31.79	187	52	6	3	.....
Nelson	376	335	41	29,648.62	20.93	112.31	112	29.79	15.24	264	70.21	33.85	258	4	2	.....	.....
Totals	1,515	1,027	488	141,688.54*	100.00	181.65	735	.....	100.00	780	.....	100.00	608	137	22	8	5
Per cent	100.00	67.79	32.21	.....	.....	.....	48.51	.....	.....	51.49	.....	.....	40.13	9.05	1.45	0.53	0.33
Ten-year average, 1941–50	1,472	948	524	119,217.30	.....	.....	734	.....	.....	738	.....	.....	569	134	26	5	4
Per cent	100.00	64.40	35.60	.....	.....	.....	49.86	.....	.....	50.14	.....	.....	38.66	9.10	1.77	0.34	0.27

* Cost correct to date. Subject to later revision.
Cost to other parties (314 cost fires), $195,486.89. Cost to Forest Service (780 cost fires), $141,688.54.
Detailed final costs are published one year in arrears in the table "Expenditure by Districts" in each Annual Report.

PROSECUTIONS, 1950

Forest District	Information Laid	Burning without Permit	Refusing to Render Assistance in Fire-fighting	Failure to Maintain Proper Fire-protection Equipment	Failing to Report Fires	Failure to Maintain a Watchman	Fines		Served Sentence in Gaol	Suspended Sentence	Cases Dismissed	Cases Withdrawn
							Number	Amount				
Vancouver	14	5	4	4	—	1	14	$400.00	—	—	—	—
Prince Rupert	3	2	—	—	1	—	2	50.00	—	1	—	—
Fort George	6	2	3	1	—	—	4	100.00	—	1	1	—
Kamloops	18	7	11	—	—	—	12	333.20	3	3	—	—
Nelson	2	1	—	1	—	—	1	25.00	—	1	—	—
Totals	43	17	18	6	1	1	33	$908.20	3	6	1	—
Ten-year average, 1941–50	31	—	—	—	—	—	21	$608.85	1	7	1	1

Burning Permits, 1950

Forest District	Clearing Agricultural Land				Clearing Logging-slash				Clearing Railway Right-of-way				Clearing Public Roads				Grand Totals			
	Permits Issued	Area Burned Over	Fires Escaped Control	Fires Set without Permit	Permits Issued	Area Burned Over	Fires Escaped Control	Fires Set without Permit	Permits Issued	Area Burned Over	Fires Escaped Control	Fires Set without Permit	Permits Issued	Area Burned Over	Fires Escaped Control	Fires Set without Permit	Permits Issued	Area Burned Over	Fires Escaped Control	Fires Set without Permit
	No.	Acres	No.	No.	No.	Acres	No.	No.	No.	Acres	No.	No.	No.	Acres	No.	No.	No.	Acres	No.	No.
Vancouver	3,436	2,021	5	4	190	21,805	1	1	16	.....	.....	.....	42	591	.....	.....	3,684	24,417	6	5
Prince Rupert	1,219	4,734	1	2	58	126	1	1	22	.....	1	.....	23	45	.....	.....	1,322	4,905	3	3
Fort George	1,163	7,573	6	6	170	323	8	.....	22	323	19	.....	18	288	2	.....	1,373	8,507	35	6
Kamloops	1,940	11,578	.....	.....	193	441	.....	.....	2	2	.....	.....	32	58	.....	.....	2,167	12,079	.....	.....
Nelson	1,532	5,230	.....	1	54	44	.....	.....	40	.....	.....	.....	2	2	.....	.....	1,628	5,276	.....	1
Totals	9,290	31,136	12	13	665	22,739	10	2	102	325	20	.....	117	984	2	.....	10,174	55,184	44	15
Per cent	91.31	56.42	27.27	86.67	6.54	41.21	22.73	13.33	1.00	0.59	45.45	.....	1.15	1.78	4.55	.....	100.00	100.00	100.00	100.00
Ten-year average, 1941–50	7,152	19,765	24	11	489	24,940	10	1	86	390	5	.....	137	2,522	6	.....	7,864	47,617	45	12
Per cent	90.95	41.51	53.33	91.67	6.22	52.37	22.22	8.33	1.09	0.82	11.11	.....	1.74	5.30	13.34	.....	100.00	100.00	100.00	100.00

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Enrolment at Ranger School, 1950

Forest District	Rangers	Acting Rangers	Assistant Rangers	Clerks	Total
Vancouver	1	1	5	----	7
Prince Rupert	----	----	1	----	1
Fort George	----	1	2	----	3
Kamloops	----	1	4	----	5
Nelson	2	----	3	----	5
Totals, 1950	3	3	15	----	21
Totals, 1949	3	2	16	----	21
Totals, 1948	4	2	12	2	20
Totals, 1947	8	----	12	----	20
Totals, 1946	2	9	9	----	20

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Motion-picture Library

Stock Records

	Year						Totals, 1945–50
	1945*	1946	1947	1948	1949	1950	
Films in library at January 1st	74	75	75	74	77	75	----
Films withdrawn during year	4	2	8	2	3	6	25
New films added during year	5	2	7	5	1	9	29
Films in library at December 31st	75	75	74	77	75	78	----
Films used during year	†	61	77	77	74	76	----

Circulation Records

Number of loans made during year	56	164	235	436	397	416	1,704
Number of film loans during year (one film loaned one time)	85	328	632	1,122	1,075	1,046	4,288
Number of showings during year	76	371	812	1,293	1,505	1,880	5,934
Number in audiences—							
Adults	2,341	11,940	8,009	21,633	14,568	26,988	85,479
Children	6,676	10,408	25,362	20,455	24,031	95,102‡	182,034‡
Mixed	8,730	10,285	24,351	42,930	87,506	43,282	227,084
Totals	17,747	32,633	57,722	85,018	126,105	165,372‡	494,597‡

* Recording of film circulation only commenced in 1945. † No record. ‡ Including attendances of lecture tour of two school lecturers.

NOTE.—Figures of audience do not include those attending showings at the Forest Service exhibit at the Pacific National Exhibition, Vancouver.

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Forest Service Library

Classification	Items Received and Catalogued										
	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	Ten-year Average, 1941–50
Bound volumes	5	9	10	12	13	12	14	39	36	27	18
Government reports and bulletins	153	120	85	49	80	126	231	123	100	62	113
Other reports and bulletins	36	29	32	63	61	79	90	140	153	140	82
Totals	194	158	127	124	154	217	335	302	289	229	213
Periodicals and trade journals	55	43	45	50	48	51	72	72	80	102	62
References indexed	5,259	1,962	1,170	1,175	1,294	1,523	1,798	3,543	2,074	1,960	2,176

(63)

Grazing Permits Issued

District	Number of Permits Issued	Number of Stock under Permit		
		Cattle	Horses	Sheep
Kamloops	1,081	97,154	3,205	30,234
Nelson	392	9,109	1,272	890
Fort George	29	1,222	130	81
Totals, 1950	1,502	107,485	4,607	31,205
Totals, 1949	1,496	113,307	4,832	33,999
Totals, 1948	1,328	117,133	5,526	31,664
Totals, 1947	1,322	105,723	5,513	26,189
Totals, 1946	1,379	106,273	5,035	31,274
Totals, 1945	1,378	109,201	5,064	39,235
Totals, 1944	1,320	101,696	4,862	40,858
Totals, 1943	1,221	93,497	4,844	39,921
Totals, 1942	1,130	84,788	4,797	36,962
Totals, 1941	881	77,774	4,180	39,552
Ten-year average, 1941–50	1,295	101,687	4,925	34,844

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Grazing Fees Billed and Collected

Year	Fees Billed	Fees Collected	Outstanding
1940	$23,338.28	$38,146.48	$27,203.90
1941	23,781.19	29,348.82	21,636.87
1942	25,116.02	30,802.23	15,950.56
1943	24,680.37	31,148.36	9,482.57
1944	28,554.02	31,000.34	7,036.25
1945	30,066.34	31,465.28	5,637.36
1946	30,120.38	31,412.24	4,345.50
1947	28,584.74	29,203.74	3,726.50
1948	28,960.42	27,089.74	5,597.18
1949	27,819.65	28,299.94	5,113.39
1950	80,178.43	74,305.08	10,986.74

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