PROVINCE OF BRITISH COLUMBIA

REPORT

OF

THE FOREST BRANCH

OF THE

DEPARTMENT OF LANDS

HON. T. D. PATTULLO, *Minister*

P. Z. CAVERHILL, *Chief Forester*

FOR THE YEAR ENDING DECEMBER 31ST

1924

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VICTORIA, B.C., April 29th, 1925.

To His Honour WALTER CAMERON NICHOL,

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 Branch of the Department of Lands for the year 1924.

T. D. PATTULLO,

Minister of Lands.

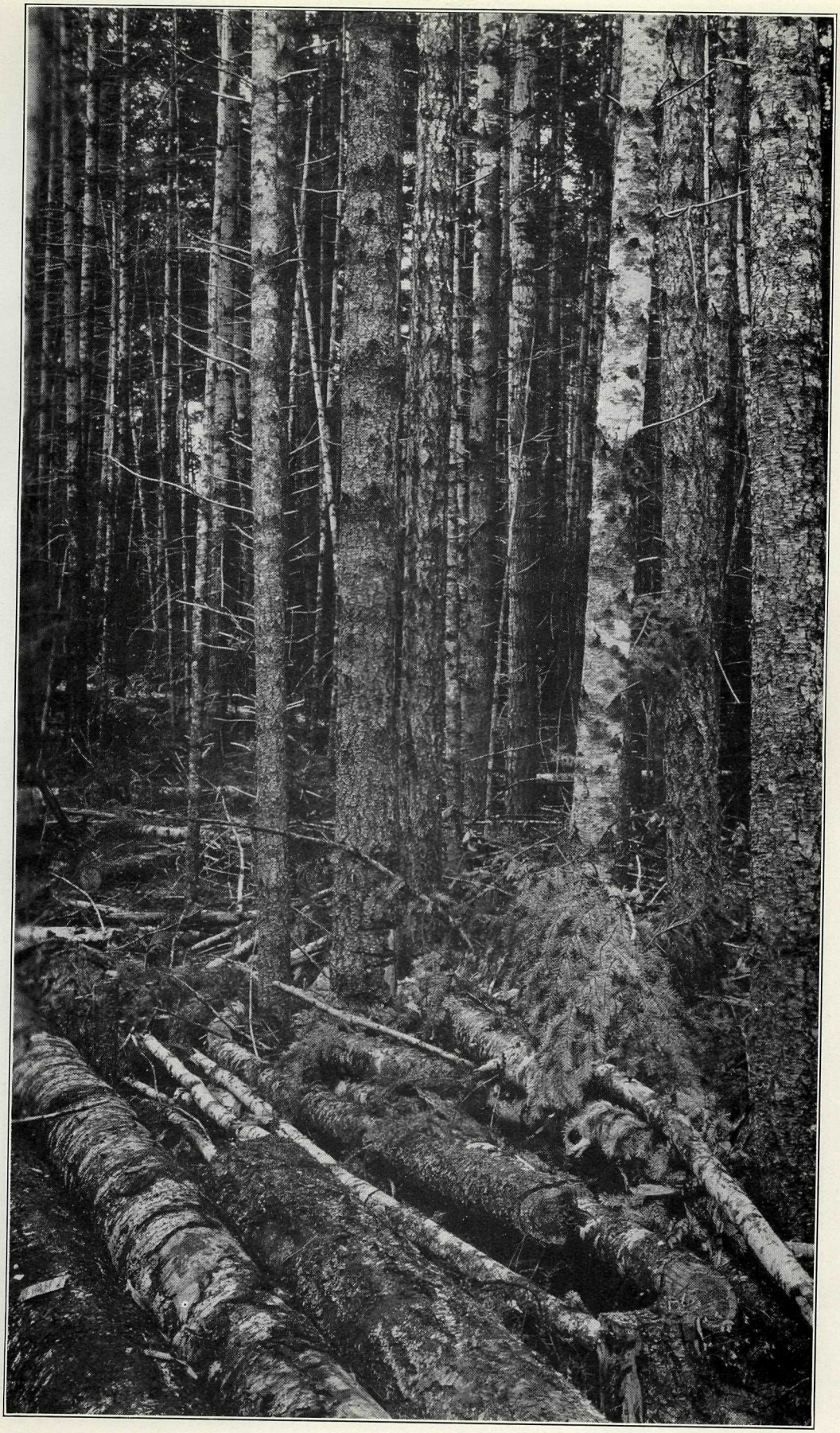
The Hon. T. D. Pattullo,

Minister of Lands, Victoria, B.C.

SIR,—There are submitted herewith statistical tables with a brief comment, covering the main activities of the Branch during the calendar year 1924.

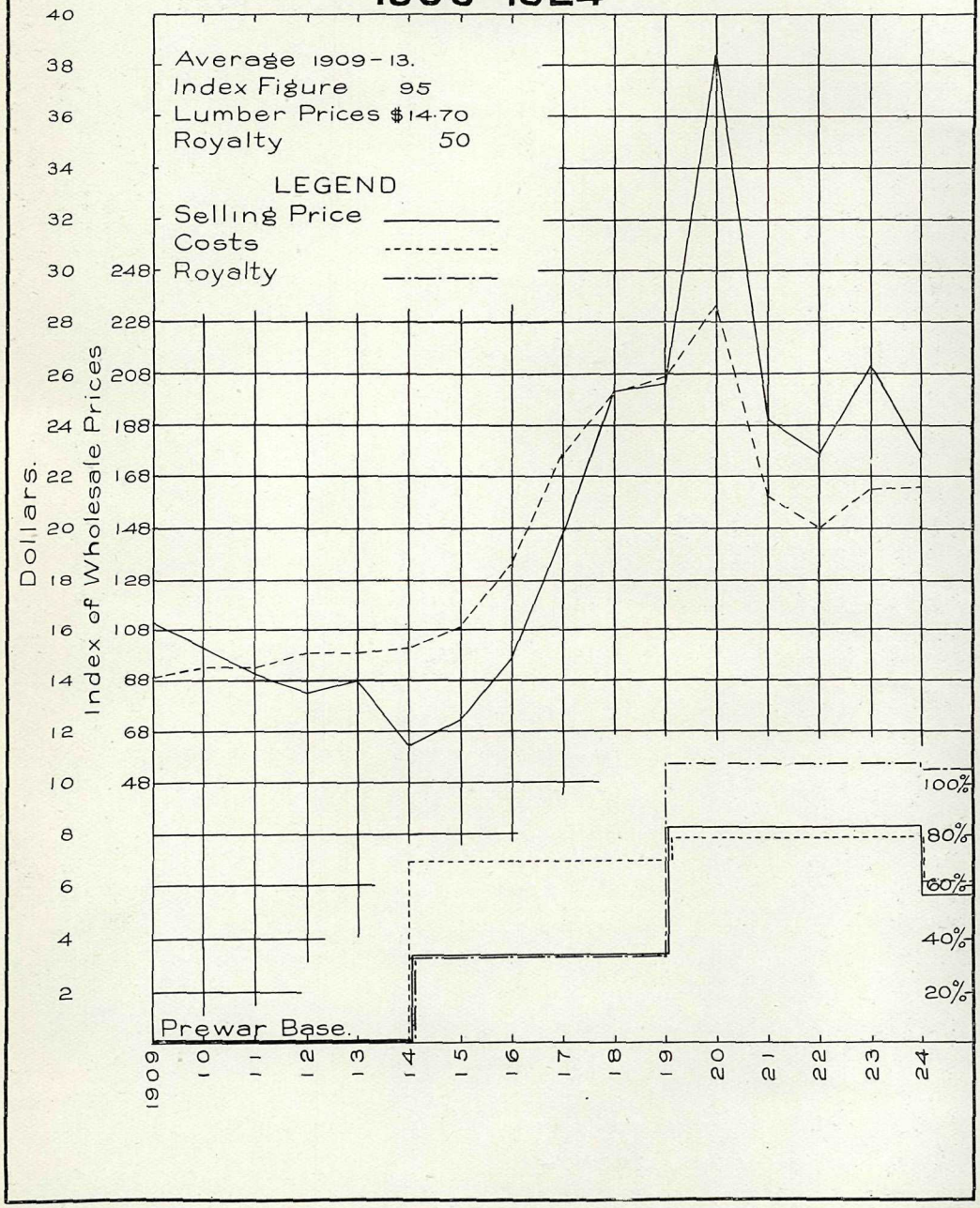
P. Z. CAVERHILL,

Chief Forester.



Douglas fir, second growth, 55 years old. Natural reproduction. These trees are already large enough for saw material.

RELATION
OF
LUMBER PRICES INDEX FIGURES AND ROYALTY
1909-1924



REPORT OF THE FOREST BRANCH,

DEPARTMENT OF LANDS.

The settlement of the royalty question was the premier event of the year in forestry. This perplexing question arose out of the "Royalty Act" of 1914, under which an attempt was made to fix the royalties payable on timber cut for a period of forty years in advance. At the time of passing this Act it was considered that advances in wholesale lumber prices would be almost wholly due to increase in stumpage values or that stumpage values would follow closely wholesale prices. The possibility of rapid increase in cost of production was not foreseen. Almost immediately after the passing of this Act the outbreak of the World War completely upset most ideas on finance and we witnessed a rapid shrinkage in the purchasing power of the dollar, until in 1920 it was worth only 40 pre-war cents. This drove the cost of producing lumber in inverse ratio to approximately $30 per M.B.M. Since 1920 readjustments have taken place and at present our dollar has increased in value to 60 pre-war cents. This means that the whole basis of production is still much higher than considered possible in 1914 and is likely to remain so for a long time to come. The old "Royalty Act" made no provision for these costs and would have taken as royalty a sum larger than the spread between the present cost of production and the value received for the sawn product.

Admitting that the purchasing power of the dollar will vary in inverse ratio with the index of prices and that the whole cost of production will increase more or less in the same ratio as the index, we then find that lumber prices to-day are relatively the same as pre-war. For five years, 1909 to 1914, the average selling-prices was about $14.70 per M.B.M. and the index figure as given for wholesale prices by the Department of Labour 95. To-day this index figure is 160. Our ratio is 95; 160: $14.70; X or $24.75 as equivalent to $14.70 pre-war lumber. In the same way royalty, during this pre-war period was 50 cents on all species and grades, would now average 85 cents. In 1914 the Act provided for a royalty averaging 67 cents and an increase of $4 or an $18 base before any further increase was made in royalty. These variations can be better shown by diagrams as in Plate 1.

The new "Royalty Act" breaks away from the principle of a long period. Since it is only by costly appraisal of stumpage values that a true basis of future values can be found with any certainty, it fixes a definite royalty for ten years only, after which the question is left entirely open to be settled as conditions then dictate. For five years the average royalty is approximately 98 cents and thereafter for the second five-year period an increase approximating 25 per cent. is provided. This Act then provides reasonable stability for development of the industry. It secures all legitimate revenue for the present and leaves no impediment to overcome when the question comes up for consideration ten years hence.

INDUSTRY.

From the standpoint of production the year 1924 showed a satisfactory record, the scale of forest products including all material exceeding any previous years. The production of sawlogs declined by 29,000,000 feet, board measure, but this was more than made up by increased production of ties and minor products. Market conditions, however, were far from satisfactory and remained weak throughout the year, with a corresponding reduction in price—the average value received f.o.b. being a full $2 per M. lower than during the previous year. This was due, partially at least, to overproduction, and yet the year disclosed a programme of expansion, either in actual construction or in immediately planned construction of plants, which will add 1,000,000 feet per day to the capacity of our lumber-mills.

The fact that 2,500,000,000 feet B.M. of our stumpage was manufactured and put on the market at a price that returned little more than the cost of manufacturing and marketing is a question that concerns not only the industry itself, but all users of lumber products. When one stops to consider that stumpage of the quality now being cut cannot be produced under any system of forestry except at costs so high as to be prohibitive, and that the quantity of such

stumpage is limited, the question assumes an importance that deserves the most careful consideration.

The total value of lumber products produced in British Columbia was $80,702,000, as compared with $86,574,000 for 1923; the decrease of $6,000,000 being due to lower prices for sawn lumber and a reduction in pulp production resulting from the closing-down of the Whalen Paper Mills, Limited, Swanson Bay mill.

ESTIMATED VALUE OF PRODUCTION.

Product.	1920.	1921.	1922.	1923.	1924.
Lumber	$46,952,500	$33,533,000	$26,400,000	$47,600,000	$41,800,000
Pulp and paper	21,611,681	13,500,000	12,590,000	15,018,000	13,938,000
Shingles	12,081,476	7,032,000	9,750,000	9,869,000	10,000,000
Boxes	2,650,000	2,000,000	1,726,000	2,072,000	2,272,000
Piles, poles, and mine-props	1,543,087	1,479,000	959,000	2,200,000	2,100,000
Cordwood, fence-posts, and mine-ties	1,495,729	1,180,000	1,187,000	1,500,000	1,400,000
Ties, railway	2,250,682	2,314,000	1,526,000	1,715,000	2,242,000
Additional value contributed by the wood-using industry	2,580,000	2,034,000	2,000,000	2,000,000	2,100,000
Laths and other miscellaneous products	847,920	250,000	400,000	500,000	550,000
Logs exported	615,732	1,648,000	2,939,000	4,200,000	4,300,000
Totals	$92,628,807	$64,970,000	$59,477,000	$86,674,000	$80,702,000

LUMBER TRADE EXTENSION.

The Department continued its trade-extension work in Eastern Canada, paying particular attention to the railway-car shops, architects, and structural engineers.

The grade exhibit installed at the Toronto office has proved of great value and has been most effective in aiding architects and engineers in drawing up their specifications. A free distribution of the British Columbia Lumber Manufacturers' Grading Rules has also aided greatly in the work. An exhibit of finished woods, shingles, etc., was again carried at the Canadian National Exhibition, Toronto, and was viewed by a steady stream of interested visitors.

As business conditions in the East improve the results of this work and that carried on for the red-cedar shingle will be reflected in the timber industry of the Province.

The bungalow exhibit at the British Empire Exhibition at Wembley, England, the material for which was provided by the lumber-manufacturers, proved a marked success, creating a new interest in British Columbia woods and the uses to which they might be put in England. This exhibit is being continued for another year.

WATER-BORNE TRADE.

Water-borne shipments, with a total of 531,262,318 feet B.M., showed an increase of 10,000,000 feet or 2 per cent. over the record year 1923. The greatest increase was in shipments to the United States, this market absorbing 313,000,000 feet as against 248,000,000 the previous year.

The success of the Wembley exhibit is reflected in an increase of 25,000,000 feet in European shipments, from 16,000,000 to 41,000,000, which is the largest since the heavy post-war years. The situation was also assisted by the low prices ruling on this side, enabling exporters to meet the European market on a better footing than for several years past.

There was a marked decrease in quantities shipped to Australia and Japan. Financial conditions in the latter country retarded business, but Australia bought much more heavily in Oregon and Washington than in British Columbia, at prices which British Columbia exporters did not feel inclined to meet. Shipments to Australia totalled 35,000,000, as against 78,000,000 in 1923.

The following table gives details of water-borne trade for the past five years:—

WATER-BORNE LUMBER TRADE, 1920, 1921, 1922, 1923, AND 1924.

Destination.	1920.	1921.	1922.	1923.	1924.
	Feet B.M.	Feet B.M.	Feet B.M.	Feet B.M.	Feet B.M.
Australia	32,218,155	27,275,928	55,949,129	78,003,422	34,848,783
New Zealand	4,159,099	4,553,603	4,516,862	11,252,890	12,169,230
South America	5,523,102	1,317,825	3,244,776	717,600	752,906
China	14,911,232	41,944,011	24,640,268	36,398,234	25,595,993
Japan	5,990,266	52,447,160	72,339,531	105,916,915	79,107,984
United Kingdom and Continent	61,217,805	13,592,562	12,698,383	16,201,290	41,527,008
South Africa	7,330,531	2,931,969	2,415,500	8,221,032	10,681,208
India and Straits Settlements	5,619,747	8,429,403	7,249,487	4,803,236	2,228,150
United States	4,162,845	25,553,543	83,856,504	248,611,600	313,104,821
Philippine and Hawaiian Islands	2,996,123	1,158,805	94,764	4,361,139	134,690
West Indies and Cuba	1,479,950	20,668	30,065	994,341	544,604
South Sea Islands	....	941,422	1,841,578	3,665,241	3,454,183
Mexico	1,015,414	.....	.....	677,756	... .
Egypt	.....	8,566,400	4,269,953	1,705,394	6,883,150
Foreign, Unclassiified	.....	.....	... ...	177,041	229,608
Totals	146,624,269	188,733,299	273,146,800	521,707,132	531,262,318

PULP AND PAPER.

The production of newsprint decreased by 6,600 tons or 4½ per cent. over the previous year. Wrapping-paper, however, increased 24 per cent. during 1924, showing a greater production than any year since 1920. Sulphite-pulp production is down 10,000 tons, caused by the closing-down of the Whalen Paper Mills, Limited, plant at Swanson Bay.

PULP.

Pulp.	1919.	1920.	1921.	1922.	1923.	1924.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Sulphite	80,347	92,299	68,502	86,894	99,878	89,839
Sulphate	9,473	16,380	6,519	9,674	9,932	14,403
Ground wood	99,769	108,665	89,725	100,759	107,266	112,001

PAPER.

Product.	1919.	1920.	1921.	1922.	1923.	1924.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Newsprint	123,607	136,832	110,176	124,639	142,928	136,281
Other papers	7,202	9,792	6,934	7,945	7,709	9,653

PERSONNEL.

The permanent staff was increased during the year by fourteen and now numbers 245. The increase in field force was three men added to the scaling staff, and three junior Foresters were added more particularly to carry on the investigative work now being undertaken. The staff at its maximum during the fire season numbered 509, of which 413 were fieldmen.

For an organization such as the Forest Branch the question of recruiting, training, and maintaining the personnel is an important problem. The examination system for selecting men and subsequent advancement has been invaluable in raising the standard of the personnel. Short Ranger schools, where the Rangers of a region can get together under woods conditions and, in conjunction with the supervising officials, work out some of the many problems with which they are faced, has been a marked success. Two such schools were held during the year, one for Coast and one for Southern Interior Rangers. While these schools were only of one week's duration each, much good was accomplished in standardizing methods and in building up an

esprit de corps. Scattered as our staff is, without some such contact they are bound to consider their many problems as individual and to treat them as such, and through lack of team-play much effort will lose in effect.

During the year we have again lost a number of our most promising men. That their service should be lost to the public is to be regretted; at the same time it is encouraging to see that the industry, in looking for the best material for their own needs, comes to the Forest Branch. We have also been fortunate in being able to supply their places through promotion.

DISTRIBUTION OF FORCE, 1924.

Forest District.	PERMANENT.													TEMPORARY.				
	Chief Forester, Assistant Chief Forester, and Foresters.	Grazing Commissioner and Assistants.	Lumber Commissioners.	District Foresters.	Supervisors of Scalers and Assistants.	Scalers and Assistant Scalers.	Asst. Foresters, Asst. Dist. Foresters, and Junior Foresters.	Inspectors, Railway, Royalty, and Mechanical.	Supervisor of Rangers and Fire Inspector.	Rangers.	Draughtsmen.	Clerks, Stenographers, and Messengers.	Wireless Telephone Operators.	Assistant Rangers.	Patrolmen and Lookout-men.	Launch Crews and Repairmen.	Cruisers, Compass-men and Packers, etc.	Total.
Cariboo	...	....	...	1	....	....	...	...	....	3	...	1	....	5	7	....	....	18
Cranbrook	...	....	...	1	....	....	1	...	...	5	....	2	...	5	20	....	....	34
Kamloops	....	....	..	1	....	....	1	....	....	3	...	2	....	6	17	....	....	30
Nelson	....	...	....	1	....	....	1	....	....	6	....	4	....	12	14	....	....	38
Prince George	....	....	....	1	...	....	1	...	2	5	1	3	...	11	9	....	....	33
Prince Rupert	1	....	....	..	....	5	1	....	2	7	....	9	....	7	3	5	....	40
Vancouver	1	...	....	....	3	36	3	....	5	20	1	28	3	24	31	29	....	186
Vernon	....	....	....	1	....	....	1	....	....	4	....	2	....	6	6	....	....	20
Victoria	4	3	2	....	1	....	8	4	....	....	7	35	....	....	...	....	44	108
Toronto	...	....	1	....	....	....	....	....	...	....	....	1	....	....	...	....	....	2
Totals	6	3	3	6	4	41	17	4	9	53	9	87	3	76	107	34	44	509

FOREST INVESTIGATIONS AND RESEARCH.

The forests of British Columbia have a wealth-producing capacity the possibilities of which, from a long-time view-point, have as yet been realized only in part. To transmute these possibilities into permanent actualities requires, however, the general acceptance of the fundamental principles that the forest is a crop rather than a mine and that the management of forest land must be conducted always with a view to perpetuation of the forests as such. It must be acknowledged that the key-note of forestry is lumber production, and that future production from cut-over lands and young stands is just as important as production from the present mature commercial stands. There is far too strong a tendency among the public and operators toward taking only present production into consideration without due regard for future needs; public interest from a long-time view-point as well as present needs should govern in determining the conditions under which exploitation takes place. Forestry is a business proposition and business considerations place definite limitations on what is feasible to do in the direction of intensive methods. The business of forestry works on so narrow a margin of profit that it is necessary to determine the most economical means of ensuring continuous production. The solution of this problem is the work of forest research.

LOWER COAST PROJECTS.

The investigative projects carried out on the Lower Coast during the past summer may be classified as reproduction studies, growth and yield studies, and fire studies.

The reproduction projects started in 1923 were continued in 1924, the work being confined to areas logged by the present systems of high-lead yarding. One hundred and seventy-six temporary plots representing various conditions were studied. This entailed seedling counts and detailed examination in over 40 miles of strip.

The following table, which has been compiled from the data gathered so far, gives a general idea of existing conditions:—

Seedlings per Acre.	Unburned.	Burned once.	Burned more than once.
	Per Cent.	Per Cent.	Per Cent.
More than 1,500	57	30	1
1,001 to 1,500	13	10	6
501 to 1,000	17	18	25
Less than 500	13	42	68

The average number of seedlings per acre on the unburned area was 2,415 for all species; on areas burned once, Douglas-fir type 1,134 and in the cedar and hemlock types 580. When we consider that planting 8 by 8 feet would require 700 trees per acre, the indications are that we will have ample reproduction on most of the areas if the fire problem is solved. These seedlings, of course, will not be as evenly distributed as if planting took place, but at the same time they are ample to ensure a new forest at the cost of protection, whereas to obtain equal results through planting which costs from $15 to $20 per acre, or an outlay of nearly $1,000,000, would be required to replace forests on the area cut annually.

Other studies indicate that seed is disseminated long distances and that forest lands when cut over will eventually come back to forests even where the seed stored in the duff may be destroyed by successive fires.

The following table shows the number of seedlings established each year on an area which was cleared, cut, and severely burned in 1915:—

Chains from Seed Area.	PER CENT. BY SPECIES.			NUMBER OF SEEDLINGS ESTABLISHED.								
	F.	H.	C.	1924.	1923.	1922.	1921.	1920.	1919.	1918.	1917.	1916.
0–20	43	42	15	2,450	2,061	1,809	1,409	1,249	761	534	555	478
20–40	61	28	11	674	508	883	299	377	105	197	90	61
40–60	46	48	6	208	179	203	274	236	154	138	70	12
60–80	47	52	1	200	317	284	234	66	83	50	17	..

The stand at the margin of the cut-over area was 75 per cent. fir, with the remainder hemlock and cedar. The soil was deep, reddish loam, characteristic of the Douglas-fir type.

Although nature in time will give us a fair crop on areas denuded of all tree-growth, this establishment is often a slow process, resulting in a long period of little growth and great fire risk, since the hazard on cut-over areas is not materially reduced until the young trees meet and form a crown canopy. Unless destroyed, rapid regeneration, however, can usually be expected from seed left on the ground by the previous stand. On this account it is desirable to adopt for each year the method of slash-disposal which destroys least of this seed and which at the same time is consistent with the requirements of protection and general economy.

During the summer thirteen permanent sample plots were established to obtain further data on the effect of burning at different seasons; the rate of establishment on burned and unburned areas, the effect of seed-trees on regeneration and under what conditions they will remain wind-firm, and the effect of density on rate of growth and mortality. Planting studies were also started to determine the results of artificial regeneration. Through the co-operation of the logging companies, who gave access to their plans and records, it was possible to prepare detailed history maps covering ten operations. These represent experiments on a commercial scale and will be an aid in solving many of the important problems.

For commercial reasons it is of importance that timber-owners, whether Government or private, know how fast the timber on any particular block of land is growing or what the land is capable of producing under forest management. Data for yield tables were gathered on eighty-six sample plots in Douglas fir, hemlock, and mixed stands. This will be supplemented by further studies next year. The following tentative table has, however, been prepared from the data already in hand:—

PRELIMINARY NORMAL YIELD TABLE.

Douglas Fir.

Based on forty-five sample plots taken in fully stocked Douglas-fir stands on Lower Coast and Vancouver Island. Site classification based on height-growth of trees forming the upper crown canopy. Volumes computed from sample trees in cubic feet. Column A shows total yield of wood material per acre. Column B shows yield per acre after deductions are made for 2-foot stumps and tops above 5-inch diameter inside bark. Basal area, 213 square feet per acre.

Site I.

Total Age.	Average Maximum Height.	Average D.B.H.	No. of Trees per Acre.	A. Volume, Cu. Ft.	B. Volume, Cu. Ft.
50	100	11.2	310	8,750	8,040
70	124	15.2	169	10,850	10,270
90	141	19 2	103	12,340	11,820
110	155	23.0	24	13,570	13,020
130	167	26.5	56	14,620	14,050
150	178	29.5	45	15,580	14,990

Site II.

50	79	8.1	595	6,830	5,740
70	99	11.9	276	8,670	8,020
90	114	15.4	165	9,980	9,440
110	126	18.3	117	11,030	10,550
130	137	22.7	76	11,990	11,450
150	145	24.1	67	12,690	11,190

Site III.

50	60	6.6	890	5,250	4,040
70	77	9.0	482	6,740	5,860
90	89	11.2	311	7,790	7,140
110	98	13.2	224	8,580	8,020
130	105	15 1	171	9,190	8,680
150	110	16.8	138	9,630	9,160

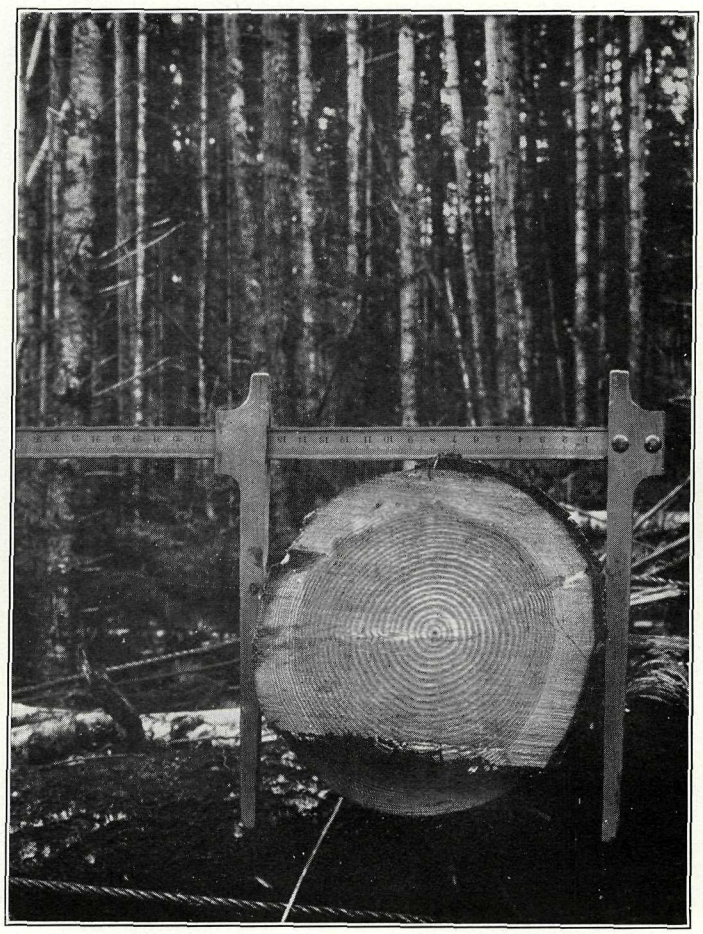
These preliminary studies, though based on incomplete data, indicate the great productive value of immature forests and cut-over lands, from which the supply of future generations when the present virgin stands are exhausted must be drawn.

NORTHERN PROBLEMS.

Forest management in the Northern Interior is faced with quite a different problem. The principal stand in this section is spruce in mixture with balsam, cedar, and lodgepole pine. Spruce is, of course, the superior tree for lumber or pulp production and at the same time it shows less ability in reproducing and maintaining its position in the stand. This is plainly indicated by the percentages of spruce in various sizes shown in the following study based on count of eight-seven sample plots:—

Species.	Mature Trees, 8 In. D.B.H. and over.	Poles, 4 to 8 In. D.B.H.	Reproduction under 4 In. D.B.H.
	Per Cent.	Per Cent.	Per Cent.
Spruce	58.0	32.8	14.2
Balsam	40.0	64.0	81.4
Fir	1.6	0.6	0.1
Hemlock	0.0	1.0	0.2
Cedar	0.4	1.0	4.1

A casual survey will show that after a fire has run through a spruce stand the reproduction is scanty; or lodgepole pine comes in, in succession. Lodgepole, in fact, has become so general over former spruce-sites as to require treatment as a distinct type. The selection system, by



Showing growth-rings, Douglas fir; 15½ inches at 55 years.

use of a diameter limit, is not applicable to our mature forests, since it takes either too many or too few trees. In the East this system has led to a depreciation of the forest and to a conversion of the former spruce stands to one composed largely of the inferior balsam.

The solution of these various problems relating to spruce regeneration and the building-up of proper management plans for these stands now becoming important as a source of lumber-supply, and offering still greater prospect for future pulp-wood, is the motive behind the undertaking of research in the Northern Interior.

During the year a preliminary survey was made of the district and a progress report prepared. A reserve covering 6,400 acres of virgin forest was set aside for the study and practice of logging under various silvicultural methods.

FOREST RECONNAISSANCE.

Forest reconnaissance work was continued with two parties in the field; one working east of Quesnel on the Cottonwood and Swift Rivers; the other completed the McKinley and Crooked River drainage-basins and started work on the McGregor watershed north-east of Prince George. The projects are discussed in some detail below.

Cottonwood River Area.—The Cottonwood is a tributary entering the Fraser from the east about 12 miles above Quesnel. The drainage area is approximately 635 square miles and contains some areas of good timber. The party cruised 32,000 acres bearing commercial stands in the main valley situated along the Cariboo–Barkerville Road and just south of Cottonwood Post-office. The area is estimated to contain a stand of 414,000,000 board-feet, an average of 13 M.B.M. per acre, 67 per cent. of which is spruce, 22 per cent. lodgepole pine, 8 per cent. fir, and 3 per cent. balsam. Owing to the small size of the trees the timber is more suitable for the manufacture of pulp and railway-ties than for logs for sawmilling purposes. This tract of timber should make an easy logging show. The Cottonwood River is considered drivable for over a month each year and the timber may be taken down it to the Fraser River.

On the Swift, a tributary of the Cottonwood, the area of merchantable timber cruised comprises nearly 10,000 acres. This tract lies on the headwaters of the Swift River and has a stand estimated at 110,000,000, or 11 M.B.M. per acre, 68 per cent. of which is spruce, 25 per cent. lodgepole pine, and 7 per cent. balsam. There is at present an infestation of spruce budworm and tip-moth on this area, but the damage done to date is not serious. Owing to the scattered nature of the timber and its distance from suitable transportation facilities the area cannot be considered a satisfactory logging chance at present.

McKinley and Crooked River Areas.—This was a continuation of the work commenced last year, when 75,000 acres containing over 1,000,000,000 feet B.M. of timber were cruised. The party this year covered 24,000 acres containing merchantable timber with a stand of 395,000,000 feet, distributed by species as follows: 51 per cent. spruce, 28 per cent. Douglas fir, 13 per cent. lodgepole pine, and 8 per cent. balsam. It averaged 16.4 M.B.M. per acre. A considerable amount of cedar is also present, but as this is very defective it has not been included in the cruise.

The above area, in conjunction with that cruised last year on the Horsefly River, shows a total stand of merchantable Crown timber of nearly 1,500,000,000 feet, of which nearly 1,000,000,000 feet is composed of species suitable for manufacture into pulp. The whole Horsefly River drainage-basin offers an excellent logging chance for development by a pulp-mill. In addition to the above timber-supply there is approximately 10,000 acres of timber land in private holdings.

In addition to the above merchantable timber there are large areas of young timber not yet of merchantable size, but which will be available when the mature timber has been cut out. If the area is properly operated, sufficient raw material to supply a large pulp-mill for all time should be obtainable.

There are sites suitable for a pulp-mill on the Quesnel River, and it is estimated that 32,000 horse-power may be developed at the west end of Quesnel Lake, while with storage this may be increased to over 40,000 horse-power. At the Little Canyon, 20 miles up the Quesnel River from Quesnel, 9,600 horse-power can be developed, or by the construction of a dam 80 feet high this could be increased to 22,000 horse-power. The maximum towing and driving distance from the heads of the McKinley and Crooked Rivers is about 60 miles. The Horsefly River will be

a good driving-stream after several jams have been taken out and improvements constructed around a couple of small falls, while the Crooked and McKinley branches, with a reasonable expenditure in clearing and controlling, will be drivable. Except for one or two isolated tracts, the maximum haul to the banks of a drivable stream will not exceed 3 miles. The area is better suited for winter than summer logging, since the swampy nature of the site requires freezing weather to make proper surface conditions for horse-logging.

McGregor Area.—The McGregor is the principal tributary of the Fraser above Prince George. Rising in the main Rocky Mountains in several branches, it flows north-westward and joins the Fraser 40 miles east of Prince George.

In 1921 a start was made on securing definite information on the timber resources of this river. One block of approximately 15,000 acres was covered and showed a merchantable stand of timber amounting to 150,000,000 board-feet.

During February and March, 1924, under the Surveyor-General's direction, a traverse of 43 miles was run on the lower river and a preliminary report made on the timber areas preparatory to further cruising. On the completion of the cruise on the McKinley and Crooked Rivers in August one party was transferred to this area, where they worked until weather conditions in the early winter forced the closing of the camp.

Two tributaries of the main river, Otter and Seeback Creeks, were covered and found to contain approximately 375,000,000 feet B.M., or 27,000 acres. The timber averaged 14,000 feet B.M. per acre—73 per cent. spruce and 27 per cent. balsam.

Only a preliminary examination has been made of a portion of the remaining timber areas on the Lower McGregor River watershed, which indicates that upwards of 1,000,000,000 feet will be found. With improvement, the lower part of the McGregor River and several streams emptying into it will be drivable for several months each year. Reconnaissance and cruising in this area will be continued early in the year 1925.

Raft River.—The Raft River is a tributary entering the North Thompson 71 miles above Kamloops. A preliminary extensive reconnaissance was made of the timber on this river. The valley has suffered very severely from fires and there was found to be only 9,000 acres of merchantable timber containing about 50,000,000 feet B.M. The areas are so scattered and transportation difficulties so great that the logging of timber is not at present an attractive proposition and for this reason does not warrant close cruising.

FOREST RESERVES.

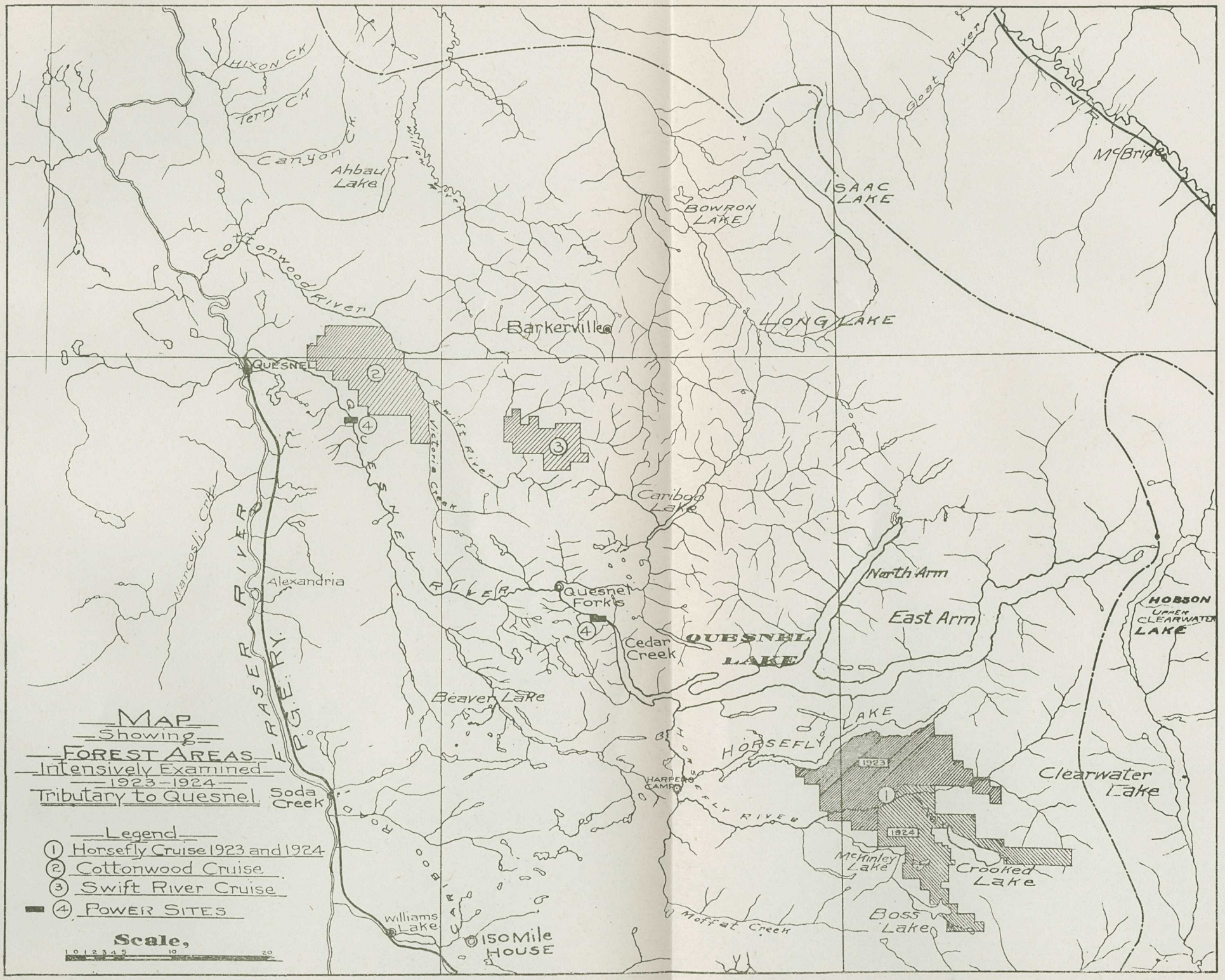
The programme of placing lands incapable of agricultural development, but suitable for timber production, under reserve as Provincial forests was continued. The reserve does not mean that the lands are withdrawn from use. They are only set aside so that a stable policy may be followed which will permit the continuous production of forest-crops. In selecting these areas an effort is made, in so far as is practicable, to exclude all areas required for higher development, and provisions are made for mining, grazing, recreation, and other uses within the forest.

During the year five reserves were proclaimed, covering an area of 2,500,000 acres, as follows:—

The Yahk Forest.—This reserve covers 788.5 square miles of mountainous country situated and forming the upper valley of Yahk River. It is well timbered at present, the stands remaining largely in the Government lands. The elevation and ruggedness of the country preclude agricultural development and as yet no highly mineralized belt has been located in this section.

The Kettle Valley Forest.—This reserve covers some 2,426 square miles. It is situated across the headwaters of Kettle River and is a continuation of the Dry Belt reserves, serving both for timber production and watershed protection. The timber, largely lodgepole pine, is immature but will be valuable for ties.

The Nehaliston Forest.—This reserve forms the west divide of the North Thompson River. It extends from the Dominion Railway Belt northward to the Mahood Lake and River, covering 900 square miles, and is the source of many small streams used for irrigation in the valley below, such as the Whitewood, Skull, Peterson, Nehaliston, and Blackwater. The elevation, about 4,000 feet, precludes agricultural development. The reserve contains valuable stands of


Hixon Ck
Terry Ck
Canyon Ck
Ahbau Lake
Cottonwood River
Williams Lake
Barkerville
Bowron Lake
Isaac Lake
Long Lake
Goat River
C.N.R.
McBride
Quesnel
Victoria Creek
Swift River
Caribou Lake
Narcosli Ck
Alexandria
Fraser River
P.G.E. Ry.
Quesnel Forks
Cedar Creek
Quesnel Lake
North Arm
East Arm
Hobson
Upper Clearwater Lake
Beaver Lake
Horsefly Lake
Horsefly River
Harper's Camp
1923
1924
Clearwater Lake
McKinley Lake
Crooked Lake
Moffat Creek
Boss Lake
Soda Creek
Williams Lake
150 Mile House
Cariboo Road
Map
Showing
Forest Areas
Intensively Examined
1923-1924
Tributary to Quesnel
Legend
1 Horsefly Cruise 1923 and 1924
2 Cottonwood Cruise
3 Swift River Cruise
4 Power Sites
Scale,
0 1 2 3 4 5 10 20

spruce timber and lodgepole pine suitable for ties. In one tract, on Skull and Peterson Creeks, a cruise shows over 7,000,000 railway-ties.

The Aleza Lake Forest.—This is a small forest of 10 square miles situated just south of Aleza Lake. It is a mature stand of spruce and is typical of the northern spruce type of forest. The object of the reserve is an experimental area for securing data on regeneration in this type of forest.

The Hardwicke Island Forest.—This reserve covers the major part of Hardwicke Island. The area has been partially logged but still contains 200,000 M.B.M.—45 per cent. cedar, 25 per cent. hemlock, 16 per cent. Douglas fir, 14 per cent. balsam, and other species. The logged areas, except where heavily burned, are being reproduced and some excellent stands of seedlings and small poles 20 feet high are located in this forest.

The work preliminary on reserving several other islands has been done and these will be recommended for reservation during 1925.

SOIL AND LAND CLASSIFICATION.

Work under this division consisted of:—

(*a.*) Special soil studies and soil typing of unalienated lands at Stuart Lake and sections of the Yahk Forest Reserve.

(*b.*) Classification of unalienated surveyed lots on west coast of Vancouver Island.

(*c.*) Regular report from general staff on areas applied for under pre-emption or for sale.

(*a.*) *Stuart Lake Area.*—A special party made a careful survey and soil map of 64,000 acres in the area reserved for settlement south-east of Stuart Lake. The report and map treats of the area under the following soil types: Good clay soils; clay soils badly burned; clay loams; sandy loams; sandy loams badly burned; gravel; peat soil; muskeg. Contour and cover maps were also prepared from information secured by running strips every 40 chains across the blocks.

Samples of soil definitely located and representative of the main types were kept for detailed analysis, both physical and chemical, to determine their value and characteristics. One large sample, representative of 6-inch breaking on the most extensive type, was sent in to the Department of Agronomy of the University of British Columbia to be put through pot tests to ascertain the need for fertilizer. Specimens of all plants encountered in quantity were taken to Victoria and identified, and valuable information was in this way obtained concerning the natural forage in the country.

Speaking generally of the area, a large portion having soil of sufficient "body" for general farm practice may be easily cleared, half of which, with improved transportation, could be profitably farmed. The report brings out very markedly the effect of burning. Owing to impaired quality through repeated fires the soil on 50 per cent. of the area will need some building-up by fertilization.

In addition to this intensive study, a general survey was made of approximately 150 square miles of non-mountainous land bordering on the lake itself for the purpose of defining areas which would support settlement with prospect of success. This latter work was only sufficiently intensive to allow for mapping the soil by broad physical divisions.

In the fall of 1924 a careful examination was made of certain lands within the Yahk Forest Reserve to determine if any portions were suitable for agricultural purposes and what were the possibilities of irrigation. The area of soil suitable for tilling was found to be limited to 2,300 acres in the eastern portion of the reserve. The area is too arid for dry-farming and sufficient water is available to supply only a small portion of the 2,300 acres which has the soil for cultivation. The expense of installation of the irrigation system would be prohibitive.

(*b.*) *West Coast of Vancouver Island.*—To avoid delay in dealing with applications for settlement it was decided to examine a number of lots on the west coast of Vancouver Island for their timber values and general suitability for agricultural use. A small party of men spent the summer on this work, covering 391 lots with a total area of 63,000 acres. One hundred of these contained timber in excess of 8,000 feet per acre and were classified, therefore, as timber land; of the remainder, 206 were suitable for settlement. In addition, forty-eight small parcels of land containing 2,200 acres, applied for as reserves, were examined.

(*c.*) *Reports from Ranger Staff.*—Classification reports by the Ranger staff for miscellaneous purposes of the "Land Act" totalled 1,190 cases, covering 201,472 acres; 61,492 acres were classed as agricultural land and 35,047 acres were recommended for reserve. The timber on the reserved land was estimated at 87,462 feet B.M. Details of these are given below:—

AREAS EXAMINED FOR MISCELLANEOUS PURPOSES OF "LAND ACT."

Forest District.	Applications for Crown Grants.		Applications for Grazing and Hay Leases.		Applications for Pre-emption Records.		Applications to Purchase.		Miscellaneous.	
	No.	Acres.	No.	Acres.	No.	Acres.	No.	Acres.	No.	Acres.
Cariboo	4	520	45	8,371	83	12,679	24	1,632	21	4,394
Cranbrook	2	360	..	.....	..	.....	16	7,119	39	34,507
Fort George	1	160	..	.....	100	15,195	27	9,681	323	34,961
Kamloops	..	.....	..	.....	16	2,575	3	313	8	1,049
Nelson	4	555	..	.....	16	2,389	16	1,998	2	856
Prince Rupert	9	1,228	..	.....	61	8,531	60	4,113	54	9,138
Vancouver	5	621	..	.....	110	9,165	39	5,458	43	14,901
Vernon	3	449	2	282	31	5,628	17	1,891	6	753
Totals	28	3,893	47	8,653	417	56,162	202	32,205	496	100,559

CLASSIFICATION OF AREAS EXAMINED IN 1924.

Forest District.	Total Area.	Agricultural Land.	Area recommended for Reserve.	Estimate of Timber on Reserved Area.
	Acres.	Acres.	Acres.	M.B.M.
Cariboo	27,596	4,593	320	6,706
Cranbrook	41,986	2,399	24,427	8,688
Fort George	59,997	31,966	2,502	15,264
Kamloops	3,937	1,023	....	....
Nelson	5,798	1,021	160	905
Prince Rupert	23,010	7,993	1,532	25,189
Vancouver	30,145	11,025	4,945	23,351
Vernon	9,003	1,472	1,161	7,359
Totals	201,472	61,492	35,047	87,462

FOREST ENTOMOLOGY.

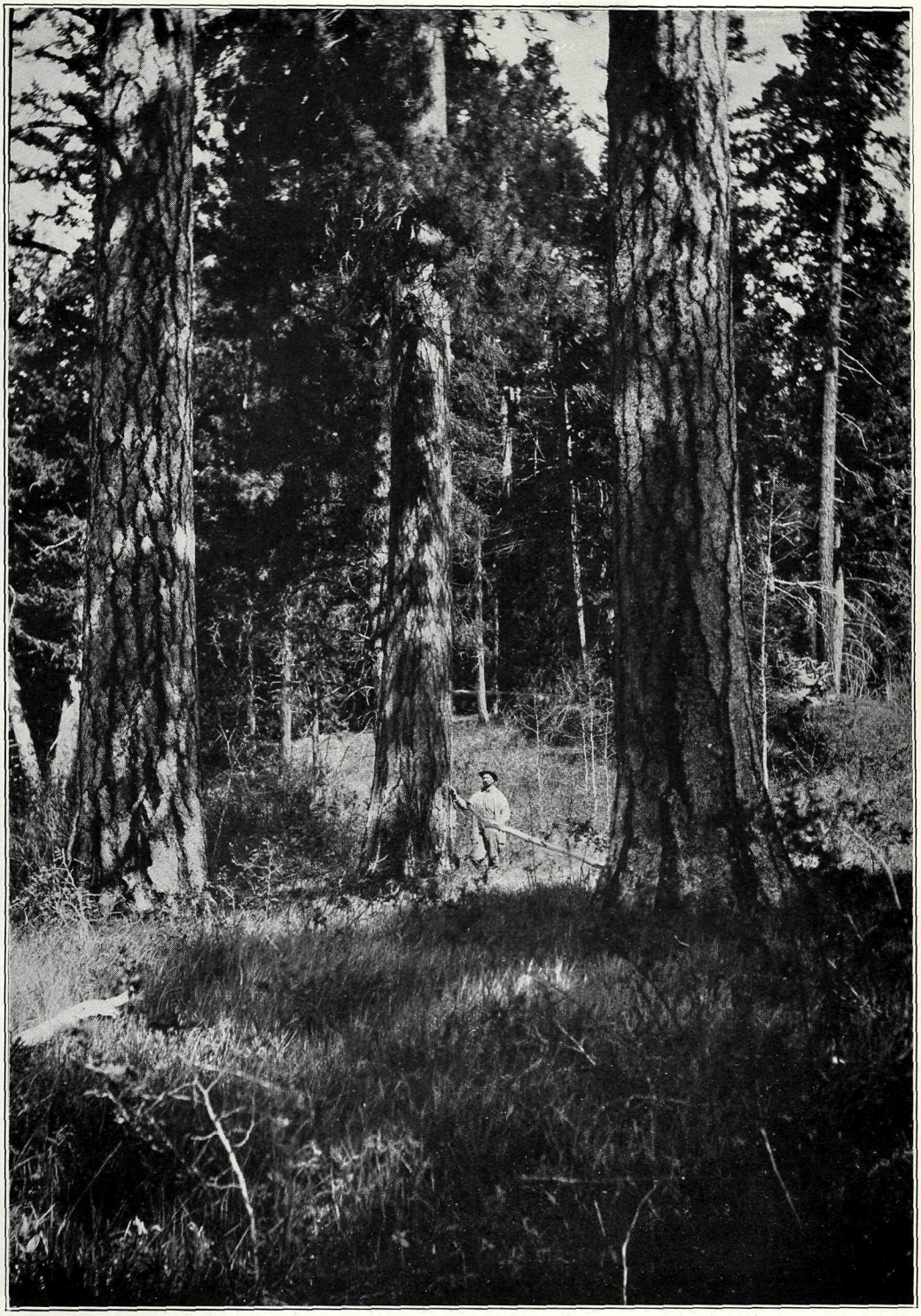
During the spring of 1924 the work of controlling the epidemic outbreak of bark-beetles (*Dendroctonus monticola* and *brevicomus*) in western yellow pine in the vicinity of Merritt was continued. The work began on April 5th and continued until June 27th, when the last camp was closed down on account of general emergence of the beetles.

The total number of men employed varied considerably, but averaged over ninety. At four of the camps—namely, those situated in Voght Valley, near Canyon House, at Spearing, and east of Kingsvale—areas worked over in previous years were recleaned and the work extended to uncontrolled adjacent areas. A new camp was placed in the vicinity of Aspen Grove, first on Otter Creek and later at Olson Lake, and a small, mobile crew was used in the latter part of June to dispose of scattered trees in the Kane Valley.

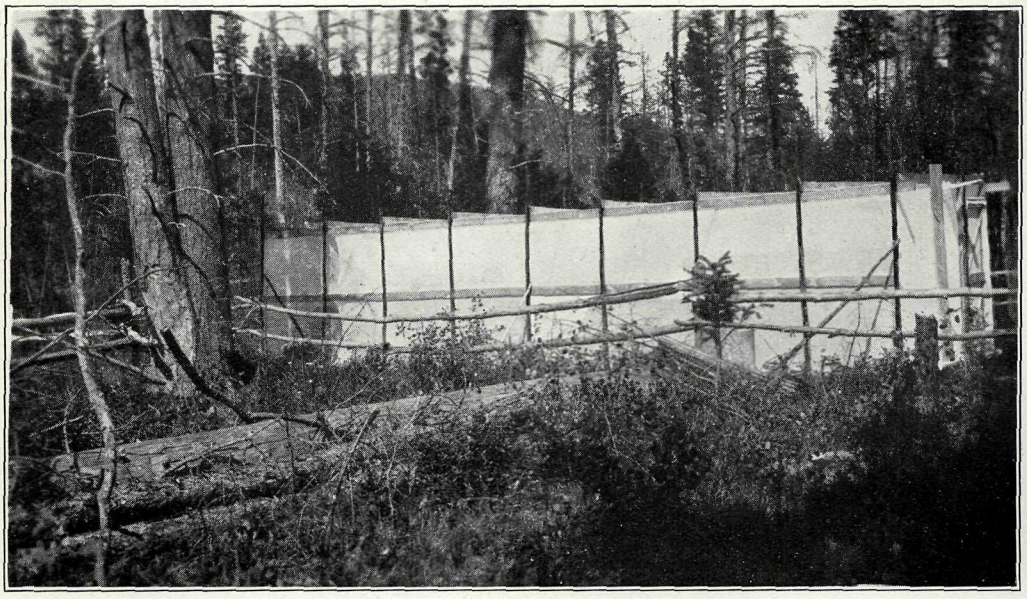
A total of 13,002 trees were treated in the vicinity of Merritt. The average cost per tree was $1.82 and the approximate average per M. board-feet was $4.88. These figures show a reduction of about 10 per cent. from the control costs of 1923. In addition, the infested logging-slash on 500 acres in the Midday Valley and on the Coutlee Plateau was piled and burned by the Forest Branch as a control measure at a cost of $5 per acre.

The history, causes, and methods of control of this epidemic, together with the effect of logging operations on the spread of the beetles, were discussed in the 1923 Annual Report. As the result of the enforcement of certain regulations affecting logging operations and the levying of a portion of the control measure costs against the owners of timber lands, the Forest Branch received vigorous protests. The contention was that the control-work was not effective; that the infestation had spread to the Coldwater Valley from the original Princeton outbreak and was in no way influenced by the logging operations carried on in that valley.

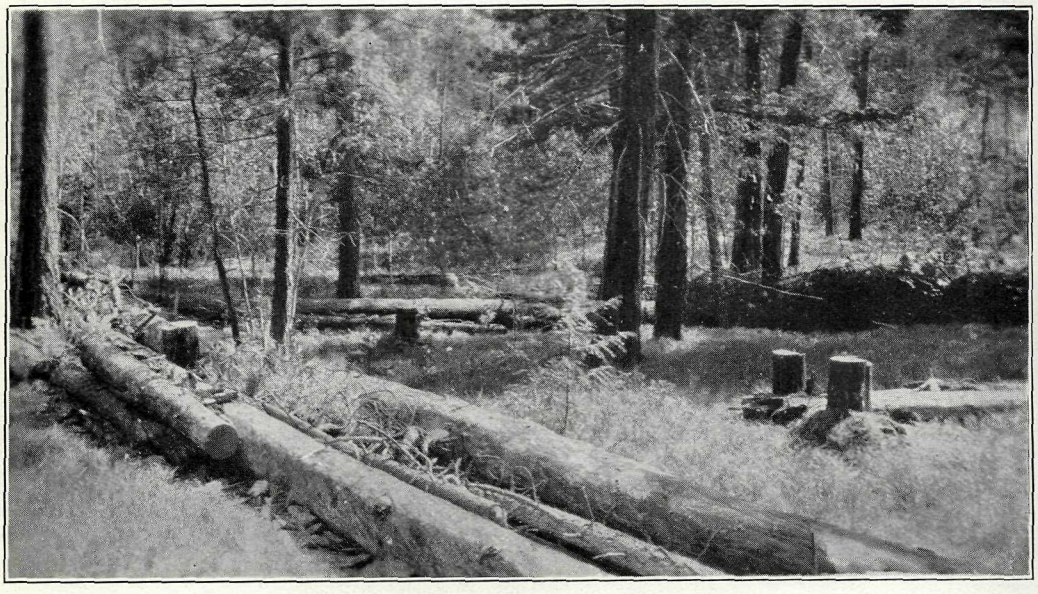
A committee was appointed to investigate and report on the results of the past five seasons' control-work and to ascertain just what would constitute an equitable distribution of the costs.



Mature yellow pine, British Columbia. These are the stands endangered by bark-beetles (*Dendroctonus*).



A cage enclosing a tree attacked by bark-beetles. This is used to entrap the emerging insects for ascertaining their life-history, their associates and parasites.



Treatment for control of bark-beetles. Trees peeled ready for burning.

This committee was composed of three men, representing the Mountain Lumbermen's Association, the Timber Industries Council, and the Provincial Government. They held a public hearing at Merritt on September 17th and later visited several epidemic areas to personally observe the results of the control-work. Their findings are as follows:—

"That it is possible that natural conditions in the Nicola Valley were ripe for an epidemic stage of the pine bark-beetle, irrespective of whether the Princeton outbreak was carried into the Nicola Valley or not.

"That the committee is inclined to the belief that the Princeton outbreak died from its own severity and from the other parasites that multiply after the pine bark-beetle.

"That direct-control work is necessary and has been apparently effective.

"That the piling and burning of slash due to logging operations to the satisfaction of the Forestry Department officials is necessary, except perhaps in the area known as the 'Midday Valley.'"

A detailed survey made of the infected areas early in the fall of 1924 indicated that control measures had definitely abated the spread of the main epidemic, and, unless an exceptional increase of the beetles occurred over the winter period, that expenditure might be materially decreased during 1925 and the succeeding year.

Kelowna Watershed.—The Dendroctonus beetle (*monticola*) has been attacking the lodge-pole pine on the Kelowna watershed, from which several important irrigation systems draw their water-supply. This outbreak was first observed in the summer of 1920 in a small patch of pine near Lorna. It was hoped that the attack would die out, but by 1923 it had spread and appeared to threaten the pine, which constitutes the chief species in the reserve; therefore two camps were undertaken, employing over twenty men on these areas during May and June. Some 5,290 trees were treated at an average cost of $1.08 per tree. A recent survey of the area shows that, allowing for a normal increase of the beetles over the winter period, probably 2,000 trees will have been treated in the spring of 1925 before the epidemic may be considered under control.

The Coast Infestation.—Beetle infestations in the Douglas fir on the Coast were first noticed about the year 1921, but nothing approaching an epidemic condition existed at that time. On the infestations becoming more evident, Ralph Hopping, Dominion Entomologist, who co-operates with the Forest Branch and is technical adviser on all questions of entomology in the Province, was requested to make an examination and report on the situation. The following are extracts from his report:—

"From the Sechelt Peninsula to Vancouver Bay the Douglas fir is in a state of epidemic infestation, caused by the Douglas fir bark-beetle (*Dendroctonus pseudotsugæ*). The infestation is more or less in patches but is very widespread, being particularly bad on Nelson, Texada, and Lasqueti Islands. Real epidemics of the Douglas fir bark-beetle in standing timber have not existed, as far as is known, in the past. There have been a few small outbreaks which have quickly subsided and in some few instances been controlled. Forest entomologists have not looked upon this bark-beetle as being a particular menace to our Douglas-fir stands. The present outbreak is therefore not only something of a surprise, but seems to be an epidemic which may equal our epidemic in yellow pine (*Pinus ponderosa*). Most of the areas around Jervis Inlet have been more or less logged and there is every indication that the infestation has slowly gathered strength, especially where logging has ceased for two or three years. This epidemic is so widespread that the cost of control of the whole area will be prohibitive.

"Epidemics in standing Douglas fir do not start as readily as in yellow pine. It is well known that the Douglas fir bark-beetle prefers recently cut logs or windfalls. It seems probable that the extensive logging, both by large concerns and hand-loggers, has for some years supplied the needs of this bark-beetle, which has during several years been gradually gaining in numbers, until on the more or less cessation of logging in certain districts the beetle has been forced to attack standing timber and, having become epidemic, is spreading. Our efforts at control should be confined, therefore, to stands of merchantable timber, especially those with natural boundaries."

In addition to the above infestation, a small one consisting of about sixty trees has been located farther north near Read Bay. These trees will be destroyed early in the year 1925.

An epidemic among the white pine in the Nimpkish River Valley, caused by the bark-beetle *Dendroctonus monticola*, was also discovered. Trees weakened by a light ground fire in 1922 were heavily attacked by beetles in 1923 and the infestation has spread to adjoining timber.

A recent survey shows that 11,000 trees are infested. Such epidemics in white pine are always dangerous, but the small amount of pine in this valley does not justify the cost of control.

Spruce Bud-worm.—An infestation of spruce bud-worm (*Cacoceia fumiferana* Clem) and tip-moth exists over a large area of spruce and balsam stands east of Quesnel. It was first observed about ten years ago, but evidently subsequently died down. During the past two summers it has become very noticeable and if the epidemic continues may cause considerable damage. To date it has, on some areas, affected nearly all the balsam, but killing only a small proportion of the stand. The spruce has not suffered to the same extent. These insects are defoliators and trees will generally endure their attacks for a number of years before succumbing. Even if not killed outright, the growth is retarded and the unhealthy condition of the trees makes them more susceptible to attacks from other enemies. These insects show a preference for balsam, which is the first species attacked.

LOG-SCALING.

The timber scaled during the year shows, in total volume, an increase of 28,000,000 feet. This increase is due to more extensive operations in ties and poles, ties totalling 3,736,619 pieces, an increase of 30 per cent. over the previous year, while poles and piling increased 39 per cent., totalling 23,360 M. lineal feet. The production of sawlogs, on the other hand, which includes logs for the pulp-mill as well, dropped from 2,237,288 M. feet in 1923 to 2,208,817 M. feet board measure. The Coast produced 80 per cent. of the total cut; the Southern Interior, 13 per cent.; and the Northern Interior, 7 per cent. Cranbrook, Vernon, and Vancouver recorded a slight loss in production, while the production in Cariboo increased 84 per cent.; Fort George, 55 per cent.; Kamloops, 42 per cent.; Nelson, 41 per cent.; and Prince Rupert, 3 per cent.

Species Cut.—The distribution of the cut by species shows a marked falling-off in production of Douglas fir, white and yellow pine. Hemlock remained almost stationary, while a considerable increase is recorded in the cut of cedar, spruce, and lodgepole pine. Since lodgepole pine has, at least until recently, been considered a tree of no value, it is of considerable interest to note that it now stands fifth with regard to the quantity of lumber produced, the cut this year exceeding 75,000,000 feet and exceeding the combined cut of both white and yellow pine. It is, of course, used largely for ties and the increase in tie production accounts for the greatly increased volume of this species. The increase in spruce production is largely due to the further development in the spruce belt along the line of the Canadian National Railway east from Prince George.

Timber scaled in British Columbia in 1924 (by Months and Districts).

		Cranbrook.	Fort George.	Cariboo.	Kamloops.	Nelson.	Vernon.	Prince Rupert.	Vancouver.	Total Logs, M.B.M.	Total Lineal Feet, Thds.	Total Cords.	Total Ties.
January	logs, M.B.M.	4,557	8,085	63	257	2,143	6,991	5,777	135,406	163,279	.....	.....	.....
"	lineal ft., thds.	111	.....	.....	100	643	92	1	482	.....	1,429	.....	.....
"	cords	3,838	15	259	386	1,851	310	147	3,913	.....	.....	10,719	.....
"	ties, number	14,275	46,029	958	.....	32,947	2,419	4,823	9,360	.....	.....	.....	110,811
February	logs, M.B.M.	4,770	10,901	62	271	1,877	647	6,337	121,167	146,032	.....	.....	.....
"	lineal ft., thds.	30	11	.....	31	225	128	112	304	.....	841	.....	.....
"	cords	5,195	112	158	281	1,721	155	938	16,362	.....	.....	24,922	.....
"	ties, number	25,472	215,542	2,353	1,597	31,004	14,268	63,273	13,447	.....	.....	.....	366,956
March	logs, M.B.M.	4,879	12,282	178	733	1,825	2,176	6,594	173,768	202,435	.....	.....	.....
"	lineal ft., thds.	41	32	.....	160	516	374	148	523	.....	1,794	.....	.....
"	cords	2,733	144	107	16	480	276	500	12,303	.....	.....	16,559	.....
"	ties, number	66,830	277,989	11,565	25,047	27,844	5,005	150,561	.....	.....	.....	.....	564,841
April	logs, M.B.M.	6,378	6,182	192	358	1,990	4,572	8,626	171,352	199,650	.....	.....	.....
"	lineal ft., thds.	23	31	.....	7	339	192	147	319	.....	1,058	.....	.....
"	cords	2,018	122	77	160	969	167	457	14,773	.....	.....	18,743	.....
"	ties, number	22,499	193,650	13,084	.....	40,579	10,847	185,662	17,071	.....	.....	.....	483,392
May	logs, M.B.M.	7,952	1,627	313	11,187	5,112	5,271	10,156	195,841	237,459	.....	.....	.....
"	lineal ft., thds.	31	115	.....	229	464	85	183	875	.....	1,982	.....	.....
"	cords	756	176	17	890	1,308	123	1,053	16,144	.....	.....	20,467	.....
"	ties, number	42,289	.....	10,194	40,743	6,724	7,087	170,160	697	.....	.....	.....	277,894
June	logs, M.B.M.	16,109	6,480	131	358	4,053	4,442	23,074	154,342	208,989	.....	.....	.....
"	lineal ft., thds.	52	61	.....	438	149	623	122	1,130	.....	2,575	.....	.....
"	cords	628	80	63	18	145	111	248	14,596	.....	.....	15,889	.....
"	ties, number	146,566	123,219	9,469	40,842	23,784	8,236	112,085	17,901	.....	.....	.....	482,102
July	logs, M.B.M.	10,856	3,640	282	713	7,418	4,562	30,201	111,043	168,715	.....	.....	.....
"	lineal ft., thds.	2	72	.....	209	204	239	323	1,310	.....	2,359	.....	.....
"	cords	221	31	.....	96	742	123	328	17,955	.....	.....	19,496	.....
"	ties, number	209,511	89,112	4,588	.....	26,975	5,898	58,086	8,001	.....	.....	.....	402,171
August	logs, M.B.M.	13,891	2,460	37	11,460	8,469	1,719	21,228	102,389	161,653	.....	.....	.....
"	lineal ft., thds.	43	23	.....	283	811	62	253	1,086	.....	2,561	.....	.....
"	cords	836	32	21	227	1,188	33	284	11,599	.....	.....	14,220	.....
"	ties, number	176,163	390	2,087	34,886	42,401	32,930	86,470	2,780	.....	.....	.....	378,107
September	logs, M.B.M.	17,509	5,239	6	596	2,139	3,999	13,057	118,789	161,334	.....	.....	.....
"	lineal ft., thds.	18	2	38	426	460	42	350	1,049	.....	2,385	.....	.....
"	cords	1,148	.....	48	185	718	78	272	16,890	.....	.....	19,339	.....
"	ties, number	100,685	12,025	.....	.....	16,753	3,389	126,296	1,260	.....	.....	.....	260,408
October	logs, M.B.M.	12,574	4,994	45	2,384	2,748	1,738	20,568	154,517	199,568	.....	.....	.....
"	lineal ft., thds.	77	67	.....	116	441	78	155	1,010	.....	1,944	.....	.....
"	cords	984	33	172	34	966	.....	1,206	15,235	.....	.....	18,630	.....
"	ties, number	92,682	968	190	3,615	7,638	1,715	101,824	167	.....	.....	.....	208,799
November	logs, M.B.M.	5,615	3,907	90	4,724	12,205	3,252	5,690	131,956	167,439	.....	.....	.....
"	lineal ft., thds.	35	55	.....	559	487	215	61	765	.....	2,177	.....	.....
"	cords	1,334	18	.....	502	1,393	49	5,099	14,836	.....	.....	23,231	.....
"	ties, number	43,799	934	.....	4,085	220	59	38	.....	.....	.....	.....	49,135
December	logs, M.B.M.	11,420	4,638	368	.....	15,635	1,240	20,285	138,678	192,264	.....	.....	.....
"	lineal ft., thds.	21	3	.....	90	716	88	403	934	.....	2,255	.....	.....
"	cords	973	.....	589	24	1,816	189	96	8,726	.....	.....	12,413	.....
"	ties, number	12,212	6,924	.....	58	24,786	801	57,554	49,668	.....	.....	.....	152,003
Totals for year	logs, M.B.M.	116,510	70,435	1,767	33,041	65 614	40,609	171,593	1,709,248	2,208,817	.....	.....	.....
"	lineal ft., thds.	484	472	38	2,648	5,455	2,218	2,258	9,787	.....	23,360	.....	.....
"	cords	20,664	763	1,511	2,819	13,297	1,614	10,628	163,332	.....	.....	214,628	.....
"	ties, number	952,983	966,782	54,488	150,873	281,655	92,654	1,116,832	120,352	.....	.....	.....	3,736,619

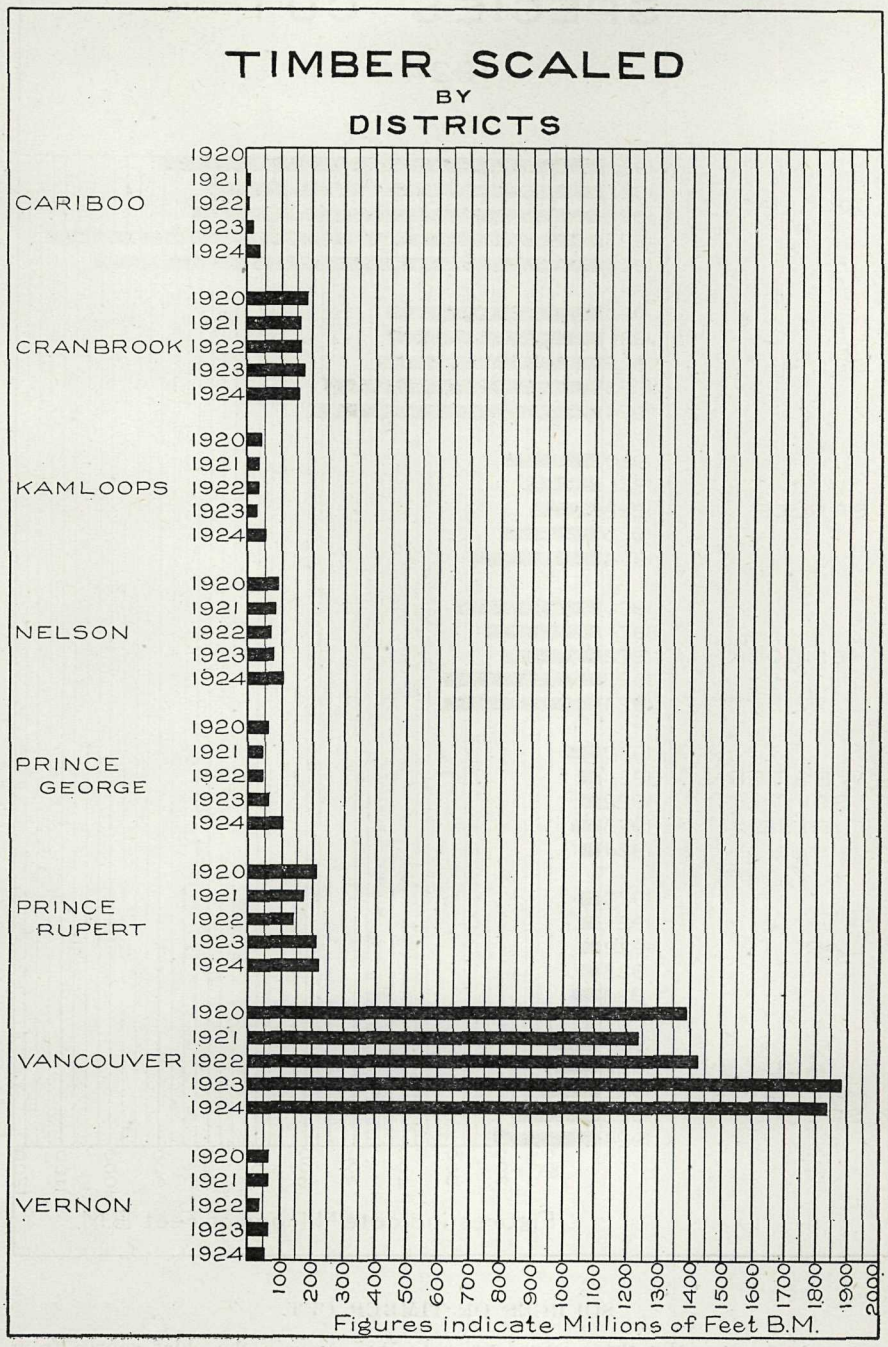
Total scaled, 2,549,700,181 feet B.M.

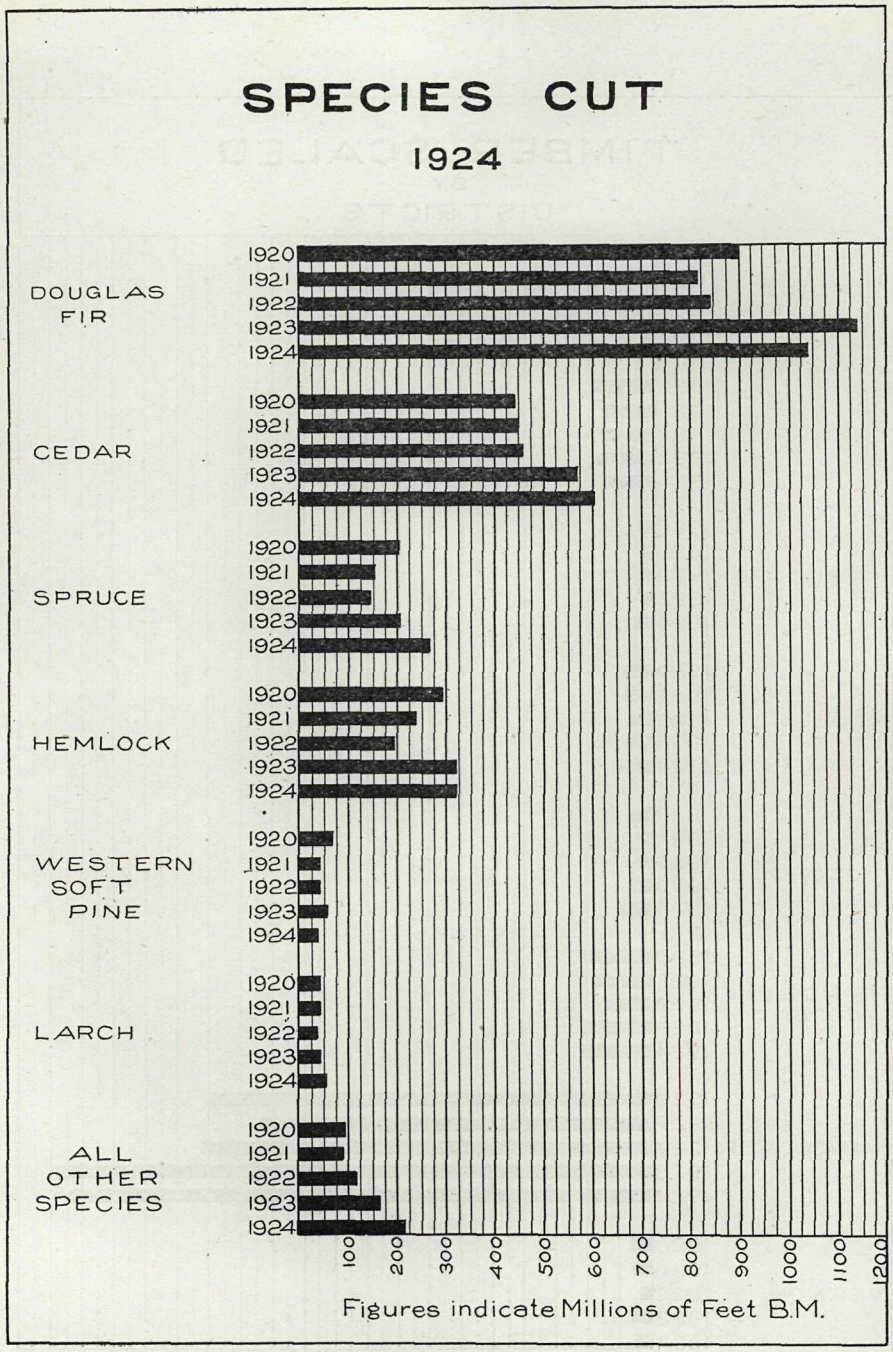
SPECIES CUT IN 1924.

Forest District.	Douglas Fir, M.B.M.	Red Cedar, M.B.M.	Spruce, M.B.M.	Hemlock, M.B.M.	Balsam, M.B.M.	Yellow Pine, M.B.M.	White Pine, M.B.M.	Jack-pine, M.B.M.	Larch, M.B.M.	Cottonwood, M.B.M.	Not Specified, M.B.M.	Other Species, M.B.M.	Total, M.B.M.
Cranbrook	21,707	4,886	58,770	74	1,408	6,683	2,824	5,925	45,925	12	10,829	....	159,045
Fort George	5,635	2,682	59,478	1	5,698	.....	.....	29,816	.....	....	78	2	103,390
Cariboo	3,329	189	446	.....	43	36	.....	.....	.....	....	368	3	4,414
Kamloops	24,241	13,678	12,869	184	40	.....	584	582	.....	....	186	44	52,408
Nelson	14,234	39,858	3,526	14,310	105	4,648	18,245	32	10,386	20	2,976	....	108,340
Vernon	11,634	7,880	1,912	.....	.....	26,987	1,231	1,052	585	40	4,073	....	55,394
Totals, Interior	80,780	69,173	137,001	14,569	7,294	38,354	22,884	37,409	56,896	72	18,510	49	482,991
Prince Rupert	2,435	32,145	86,667	46,384	16,900	.....	.....	32,116	.....	1,378	5,025	43	223,093
Vancouver	952,804	508,883	44,231	261,762	41,875	.....	2,359	6,370	.....	3,467	21,748	117	1,843,616
Totals, Coast	955,239	541,028	130,898	308,146	58,775	.....	2,359	38,486	.....	4,845	26,773	160	2,066,709
Grand totals, 1924	1,036,019	610,201	267,899	322,715	66,069	38,354	25,243	75,895	56,896	4,917	45,283	209	2,549,700
Grand totals, 1923	1,139,149	573,615	209,017	322,217	71,538	61,790	31,183	53,491	44,887	4,535	.....	313	2,521,735
Grand totals, 1922	846,171	461,265	149,247	238,891	38,904	43,630	34,405	43,774	39,759	2,869	.....	243	1,899,158

TOTAL AMOUNTS OF TIMBER SCALED IN BRITISH COLUMBIA DURING YEARS 1923–24.

Forest District.	1923.	1924.	Gain.	Loss.	Net Loss.	Net Gain.
Cranbrook	176,233,923	159,044,946	.....	17,188,977	.....	.....
Fort George	66,372,353	103,390,428	37,018,075	.....	.....	.....
Cariboo	2,384,447	4,413,884	2,029,437	.....	.....	.....
Kamloops	36,915,462	52,407,521	15,492,059	.....	.....	.....
Nelson	76,642,450	108,340,110	31,697,660	.....	.....	.....
Vernon	63,314,250	55,393,898	.....	7,920,352	.....	.....
Totals, Interior	421,862,885	482,990,787	.....	.....	.....	61,127,902
Prince Rupert	216,211,036	223,093,682	6,882,646	.....	.....	.....
Vancouver	1,883,661,360	1,843,615,712	.....	40,045,648	.....	.....
Totals, Coast	2,099,872,396	2,066,709,394	.....	.....	33,163,002	.....
Totals for B.C.	2,521,735,281	2,549,700,181	.....	.....	.....	27,964,900


TIMBER SCALED
BY
DISTRICTS
CARIBOO
CRANBROOK
KAMLOOPS
NELSON
PRINCE GEORGE
PRINCE RUPERT
VANCOUVER
VERNON
1920
1921
1922
1923
1924
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
Figures indicate Millions of Feet B.M.



SOURCES OF TIMBER CUT.

Crown grants, especially those issued prior to 1887, remain the chief source from which our timber-supply is drawn. Twenty-four per cent. of the total cut is secured from this latter source, which includes such grants as the Esquimalt & Nanaimo Railway lands, Eagle Pass Wagon-road lands, etc., and 40 per cent., or a total of 1,034,531 M. feet, is secured from all

classes of fee-simple lands. From special timber licences 20 per cent. of the total cut is secured and 10 per cent. from timber leases, 14 per cent. from lands under Dominion jurisdiction; that is, lands included within the Dominion Railway Belt, Indian reserves, etc. The timber-sale provided for 301,664 M. feet for the year just closed, of which 230,184 M. was sawlog material, the balance being railway-ties, poles, and for minor products.

TOTAL SCALE, 1924, SEGREGATED, SHOWING LAND STATUS.

Forest District.	Timber Licences, M.B.M.	Timber Leases, M.B.M.	Hand-logger Licences, M.B.M.	Timber-sales, M.B.M.	Pre-emptions, S.R., and Misc., M.B.M.	Crown Grants, M.B.M.				Dominion Lands, M.B.M.	Totals, M.B.M.
						To 1887.	1887–1906.	1906–1914.	1914 to Date.		
Cariboo	....	....	....	1,436	1,441	83	81	108	956	309	4,414
Cranbrook	40,675	....	....	11,031	180	439	52,528	51,235	2,957	....	159,045
Kamloops	5,255	....	....	8,172	1,667	....	54	1,173	1,929	34,157	52,407
Nelson	27,033	....	....	18,199	5,177	...	29,534	24,555	2,949	894	108,341
Fort George	22,166	....	....	31,867	15,699	....	35	12,009	21,614	....	103,390
Prince Rupert	43,826	15,436	10,004	95,252	8,311	16	19,348	21,737	8,160	1,004	223,094
Vancouver	369,685	241,770	2,210	124,286	33,941	606,102	120,474	25,262	8,772	311,113	1,843,615
Vernon	9,895	1,195	...	11,421	6,172	3,053	5,769	7,935	5,664	4,290	55,394
Totals	518,535	258,401	12,214	301,664	72,588	609,693	227,823	144,014	53,001	351,767	2,549,700

LOGGING INSPECTION.

The inspection of logging operations to prevent trespass, infraction of the "Marketing Act," and other regulations governing the cutting of timber, fire-preventive appliances, etc., is an important work of the Forest Branch. During the year 7,466 reports were received on the 3,167 operations which were active at some time during the year. These reports disclosed sixty-eight cases of trespass against Crown lands. Trespassers had cut over 570 acres and were penalized for such unauthorized cutting a total sum of $8,539.86. The number of inspections received is the largest on record and the area cut over in trespass the smallest. Field officers of the Branch are to be congratulated on this showing, and especially in the fact that the trespass area shows a steady reduction during the past few years, and during 1924 was reduced to 570 acres, as compared with 1,015 in the previous year. These figures appear to be conclusive evidence that our field inspections are bearing fruit. In addition to the trespass against Crown lands, thirty-seven cases of trespass against privately owned timber were discovered and reported to the owner for settlement, as compared with forty-five such cases for 1923.

LOGGING INSPECTION, 1924.

Forest District.	Operations.				No. of Inspections.
	Timber-sales.	Hand-logger's Licences.	Leases, Licences, Crown Grants, and Pre-emptions.	Totals.	
Cariboo	31	...	63	94	149
Cranbrook	118	...	49	167	217
Kamloops	45	...	128	173	383
Nelson	145	...	218	363	542
Fort George	145	...	308	453	830
Prince Rupert	343	53	263	659	1,272
Vancouver	325	16	596	937	3,464
Vernon	93	...	228	321	609
Totals, 1924	1,245	69	1,853	3,167	7,466
Totals, 1923	1,010	166	2,140	3,316	6,892
Totals, 1922	914	159	1,579	2,652	4,654
Totals, 1921	691	186	1,331	2,208	4,053
Totals, 1920	605	220	1,961	2,796	2,703
Totals, 1919	365	200	757	1,322	1,884

TREPASSES, 1924.

Forest District.	No. of Cases.	Areas cut over (Acres).	Quantity cut.				No. of Resulting Seizures.	Amount.
			Feet B.M.	Lineal Feet.	Cords.	Ties.		
Cariboo	6	20	8,000	375	172	635	..	$ 201 42
Cranbrook	5	80	278,223	.....	18	3,154	1	922 38
Kamloops	4	20	15,585	.....	....	218	1	337 84
Nelson	10	46	229,318	7,245	....	500	..	1,207 93
Fort George	10	88	886,215	.....	....	1,367	..	1,841 11
Prince Rupert	12	143	197,603	18,633	24	180	..	827 32
Vancouver	15	78	465,400	18,690	553	.....	..	2,586 18
Vernon	6	95	102,464	9,125	...	1,592	..	615 68
Totals, 1924	68	570	2,182,808	54,068	767	7,646	2	$ 8,539 86
Totals, 1923	105	1,015	6,712,868	121,202	1,598	20,082	8	$27,860 08
Totals, 1922	98	1,059	3,002,881	98,903	2,591	27,022	16	$16,406 30
Totals, 1921	98	1,938	3,222,673	209,395	1,639	21,605	10	$15,924 22
Totals, 1920	73	1,788	4,904,079	104,048	1,882	6,716	10	$17,119 85
Totals, 1919	87	2,454	12,708,365	48,860	88	87,120	8	$21,730 12

TIMBER-SALES.

The number of timber-sales made and their estimated value show a reduction for the year. This is due to a change in policy affecting the records in this work. Prior to 1923 the Department made a sale for a fixed period; if for any reason the logging was not completed during this period a new sale must be secured. Since 1923 the contract provides, "at the discretion of the Minister, for an extension not to exceed one year" to cover any unforeseen delays and to permit completion of logging. This change permitted the cleaning-up of many areas under the original contract which formerly would have required a new sale.

The average stumpage price received for sales shows an increase of 6 cents per M. feet on an average of all species as compared with the previous year. This price is very satisfactory when considered with the slower lumber market and general upset due to fixing a new royalty, effective over most of the timber sold.

The quantity of material cut and the revenue received from timber-sales both show a substantial increase. The cut of railway-ties increased 84 per cent.; poles, 65 per cent.; and saw-logs, 11 per cent. The Vancouver District still leads in the timber-sale business, but is closely followed by Prince Rupert. In fact, during the year more contracts were executed through the Prince Rupert office than through Vancouver.

Timber-sales awarded by Districts.

District.	No. of Sales.	Acreage.	Saw-timber (Ft. B.M.).	Poles and Piles (Lineal Feet).	No. of Posts.	Shingle-bolts and Cordwood (No. of Cords).	No. of Railway-ties.	Estimated Revenue.
Cariboo	15	2,949	922,860	32,500	.....	2,075	24,125	$ 5,287 25
Cranbrook	53	15,838	54,422,884	166,475	.....	14,596	1,082,196	202,823 10
Fort George	97	17,825	38,266,605	484,979	.....	120	393,517	155,594 11
Kamloops	29	5,272	7,893,554	516,782	.....	.....	45,051	40,231 60
Nelson	77	12,849	18,045,122	1,290,120	.....	3,511	179,883	97,835 82
Prince Rupert	230	38,917	41,143,640	2,308,105	.....	1,736	655,630	207,101 24
Vancouver	225	43,399	125,256,784	678,060	.....	24,564	16,400	446,026 73
Vernon	43	9,603	16,861,818	859,050	.....	1,038	21,831	71,561 02
Totals, 1924	769	146,652	302,813,267	6,336,071	.....	47,640	2,418,633	$1,226,460 87
Totals, 1923	852	163,464	516,397,438	6,234,342	.....	23,150	2,304,161	$1,513,970 84
Totals, 1922	671	108,501	249,572,808	3,304,254	.....	41,580	880,307	$ 862,888 49
Totals, 1921	531	91,614	188,971,774	2,479,095	.....	34,291	993,417	$ 646,487 65
Totals, 1920	594	121,690	440,649,755	2,811,095	149,300	86,726	6,415,349	$1,799,039 03
Totals, 1919	356	61,809	245,209,300	2,899,000	5,000	52,557	957,804	$ 654,372 09
Totals, 1918	227	34,257	159,659,000	378,080	20,000	18,478	701,654	$ 380,408 33
Totals, 1917	255	44,914	240,307,057	1,517,450	40,000	43,756	381,200	$ 483,281 50
Totals, 1916	133	23,318	136,345,000	435,810	.....	26,666	92,000	$ 259,765 12

AVERAGE SALE PRICE BY SPECIES.

Saw-timber.	FIGURES FOR 1924.		FIGURES FOR 1923.		FIGURES FOR 1922.	
	Board-feet.	Price per M.	Board-feet.	Price per M.	Board-feet.	Price Per M.
Douglas fir	74,708,507	$1 73	75,915,023	$1 72	58,467,465	$1 43
Cedar	63,367,585	2 28	61,303,504	2 25	62,788,240	1 66
Spruce	74,064,508	1 63	101,703,592	1 58	42,207,248	1 46
Hemlock	33,622,807	1 21	43,956,950	1 14	42,987,260	1 01
Balsam	13,295,185	1 10	17,580,743	1 10	16,757,880	1 04
White pine	5,802,597	2 63	4,184,830	2 85	4,304,380	1 93
Western soft pine	9,446,869	1 83	28,211,030	1 88	9,704,385	1 47
Tamarack	4,804,072	1 63	5,824,305	1 80	2,998,750	1 75
Other species	23,701,137	1 50	6,402,401	1 34	9,357,200	78
Totals	302,813,267	$1 74	345,082,438	$1 68	249,572,808	$1 39

TIMBER CUT FROM TIMBER-SALES DURING 1924.

Forest District.	Feet B.M.	Lineal Feet.	Cords.	Ties.
Cariboo	533,161	19,283	486.53	19,283
Cranbrook	7,293,419	49,851	2,189.79	72,117
Fort George	19,632,035	362,628	248.00	439,804
Kamloops	3,918,068	824,266	21.00	54,399
Nelson	9,021,070	1,519,575	1,324.58	108,826
Prince Rupert	62,817,974	852,788	2,129.53	829,450
Vancouver	117,018,589	522,264	10,211.57	8,697
Vernon	9,914,259	390,716	683.00	11,339
Totals, 1924	230,148,575	4,541,371	17,294.00	1,543,915
Totals, 1923	207,473,848	2,753,532	17,666.55	856,628
Totals, 1922	187,217,151	1,523,744	37,345.91	495,672
Totals, 1921	179,780,056	2,169,550	10,483.00	831,423
Totals, 1920	168,783,812	1,638,549	17,703.00	654,829
Totals, 1919	107,701,950	672,699	12,208.00	573,286
Totals, 1918	113,927,610	499,589	15,539.00	146,807
Totals, 1917	99,078,832	545,429	14,862.00	34,937
Totals, 1916	63,055,102	225,799	8,425.00	.....

AREAS CRUISED FOR TIMBER SALES, 1924.

Forest District.	Number cruised.	Acreage.	Saw-timber (M.B.M.).	Poles and Piles (Lineal Feet).	Shingle-bolts and Cordwood (Cords).	Railway-ties (No.).
Cariboo	27	5,511	6,318	32,660	7,155	109,069
Cranbrook	54	7,725	19,281	.....	5,387	84,780
Fort George	113	26,315	84,417	516,972	184	423,766
Kamloops	46	9,175	25,153	1,170,607	.....	124,222
Nelson	92	11,084	15,110	1,160,170	4,060	235,825
Prince Rupert	263	48,166	100,614	3,046,665	136	868,471
Vancouver	299	61,503	169,473	1,720,000	22,219	11,600
Vernon	48	10,130	31,110	818,850	2,413	16,221
Totals	942	179,609	451,476	8,465,924	41,554	1,873,954

MILLING.

The sawmill capacity for the year was 14,604 M.B.M. per day, an increase of 14 per cent. over the previous year and an increase of 25 per cent. in five years. Seventy-eight per cent. of the mills, representing 82 per cent. of capacity, operated during the year, the lumber produced representing approximately 50 per cent. of the total possible production if these mills had operated throughout the year. Shingle-mills had a capacity of 17,400 M. shingles per day. Twenty mills, representing 10 per cent. of the capacity, remained closed throughout the year. Seventy-eight mills operated some time throughout the year.

SAW AND SHINGLE MILLS OF THE PROVINCE, 1924.

Forest District.	Sawmills.		Shingle-mills.		Sawmills.		Shingle-mills.	
	No.	Operating, Estimated Daily Capacity, M.B.M.	No.	Operating, Estimated Daily Capacity, Shingles, M.	No.	Shut down, Estimated Daily Capacity, M.B.M.	No.	Shut down, Estimated Daily Capacity, Shingles, M.
Cariboo	11	60	..	....	15	70	..	....
Cranbrook	29	1,085	..	....	10	425	..	....
Kamloops	20	541	..	....	1	35	1	120
Nelson	36	610	8	345	10	240	2	150
Fort George	25	698	..	....	1	50	..	....
Prince Rupert	23	827	..	....	11	280	1	200
Vancouver	186	7,711	70	15,291	48	1,264	16	1,310
Vernon	29	454	..	....	13	254	..	....
Totals for 1924	359	11,986	78	15,636	103	2,618	20	1,780
Totals for 1923	352	11,273	107	16,144	72	1,493	16	745
Totals for 1922	292	9,683	108	15,544	90	2,054	8	680
Totals for 1921	289	8,912	79	10,885	78	2,029	6	788
Totals for 1920	341	10,729	109	13,426	37	909	2	30

EXPORT OF LOGS DURING YEAR 1924.

Species.	Grade No. 1.	Grade No. 2.	Grade No. 3.	Ungraded.	Totals.
	F.B.M.	F.B.M.	F.B.M.	F.B.M.	F.B.M.
Cedar	11,331,040	37,030,624	28,756,051	2,589,756	79,707,471
Fir	11,561,554	69,207,421	18,625,221	....	99,394,196
Spruce	485,105	5,115,814	2,089,110	3,250,217	10,940,246
Hemlock	.....	.....	.....	38,933,105	38,933,105
White pine	26,845	281,118	35,921	3,464,732	3,808,616
Other species	12,272	166,039	42,832	7,526,050	7,747,193
Totals, 1924	23,416,816	111,801,016	49,549,135	55,763,860	240,530,827
Totals, 1923	26,081,071	107,815,949	45,971,600	53,789,421	233,658,041

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

Forest District.	Quantity exported.	Approximate Value, F.O.B.	Where marketed.	
			United States.	Canada.
Cranbrook—				
Poles and piling	Lin. ft., 430,595	$ 51,671	75,567	355,028
Mine-props	Lin. ft., 615,100	61,510	.....	615,100
Cordwood	Cords, 433	3,031	.....	433
Fence-posts	Cords, 4,595	36,760	.....	4,595
Ties	No. 1,047,561	523,780	.....	1,047,561
Fort George—				
Poles and piling	Lin. ft., 466,110	55,933	437,330	28,780
Mine-props	Lin. ft., 6,400	640	.....	6,400
Fence-posts	Cords, 492	5,328	.....	492
Ties	No. 839,830	501,333	.....	839,830
Kamloops—				
Poles and piling	Lin. ft., 1,281,483	179,417	1,151,018	130,465
Mine-props	Lin. ft., 66,794	9,351	.....	66,794
Fence-posts	Cords, 108	675	.....	108
Nelson—				
Poles and piling	Lin. ft., 4,620,638	523,468	4,461,983	158,655
Fence-posts	Cords, 4,502	35,452	3,446	1,056
Shingle-bolts	Cords, 1,587	11,544	1,331	256
Vernon—				
Poles and piling	Lin. ft., 761,060	102,619	752,985	8,075
Railway-ties	No. 510	255	510	.....
Prince Rupert—				
Poles and piling	Lin. ft., 2,234,109	303,483	1,021,765	1,212,344
Fence-posts	Cords, 291	2,399	.....	291
Railway-ties	No. 765,730	417,466	.....	765,730
				Other foreign countries.
Vancouver—				
Poles and piling	Lin. ft., 7,315,289	953,358	7,243,244	72,045
Fence-posts	Cords, 78	706	.....	78
Shingle-bolts	Cords, 614	13,378	83	531
Pulp-wood	Cords, 17,397	173,978	17,397	.....
Total value, 1924	.....	$3,967,535	.....	.....
Total value, 1923	.....	$3,037,365	.....	.....

PRE-EMPTION INSPECTION REPORTS, 1924.

Pre-emption records examined by districts are:—

Cariboo	768
Cranbrook	66
Fort George	704
Kamloops	145
Nelson	88
Prince Rupert	574
Vancouver	480
Vernon	298
Total	3,123

ANALYSIS OF ROUTINE WORK.

Month.	Number of Tracings made.						Blue-prints from Reference Maps.	Ditto Prints.
	Timber-sales.	Timber-marks.	Examination Sketches.	Hand-logger Licences.	Miscellaneous.	Totals.		
January	40	116	38	4	25	223	53	750
February	10	157	29	5	62	263	55	206
March	30	153	27	9	152	371	82	379
April	23	92	32	17	144	308	170	349
May	24	100	38	10	197	369	32	256
June	11	65	28	20	16	140	160	220
July	26	56	34	12	27	155	34	402
August	21	22	35	4	17	99	41	386
September	12	79	29	3	16	139	34	191
October	30	81	37	4	52	204	74	485
November	25	79	22	2	58	186	19	460
December	19	92	15	13	33	172	167	198
Totals	271	1,092	364	103	799	2,629	921	4,282

TIMBER-MARKS ISSUED.

	1922.	1923.	1924.
Old Crown grants	129	146	133
Crown grants, 1887–1906	120	147	131
Crown grants, 1906–1914	132	188	168
"Royalty Act"	291	392	310
Stumpage reservations	26	64	57
Pre-emptions under sections 28A and 28B, "Land Act"	20	45	21
Timber leases (50 cents royalty)	3	1	.....
Dominion lands	58	115	85
Timber-sales	671	853	769
Hand-loggers	58	55	30
Special marks	3	1	1
Totals	1,511	2,007	1,705
Transfers and changes of marks	345	267	258

HAND-LOGGERS' LICENCES.

	1922.	1923.	1924.
Number issued	288	198	93

CORRESPONDENCE.

Letters inward, numbered and recorded	39,800
Letters, reports, etc., received, not numbered or recorded	15,000
Total	54,800
Outward typed letters	20,000
Outward circulars, form letters, etc.	24,000
Total	44,000

REVENUE AND EXPENDITURE.

The collection of revenue has been most satisfactory and exceeded 1923 by a small margin. Licence fees declined by an amount equal to $135,000. This, however, was made up in added collections from active operations, both stumpage and royalty showing a substantial increase. The total revenue for the year was $3,483,353.12, as compared with $3,482,365.29 for 1923. This does not include funds received through the Treasury Department for taxation of timber land nor funds collected for forest-protection and scaling. The receipts from operations were $2,271,890.61, an increase of 7 per cent. over the previous year and an increase of 47 per cent. in the past five years. Administrative expenditures amounted to $377,150.36. Some $16,000 of this, however, was extraordinary expenditure for permanent improvements, including a new launch for the Vancouver headquarters staff and a residence for the District Forester at Williams Lake. These items should properly be charged over the next fifteen or twenty years and would leave the net expenditure for the year at approximately $362,000, or 17.3 per cent. of the operating revenue, as against 17.5 per cent. for the previous years.

The expenditure on trade extension increased from $19,757 to $37,093.12. This large increase was due, first, to the installation of a special exhibit at Wembley and the expenses of sending a Lumber Commissioner to London; second, to the installation of an exhibit at the Toronto National Fair at Toronto; and, third, to expenditures in connection with the Imperial Forestry Conference.

The demand for information with regard to pulp areas enforced greater activity in reconnaissance, increasing the expenditures on this account from $28,000 to $50,000.

The insect-control vote was also increased, but it is to be noted that this expenditure has now reached its maximum and will apparently decline beginning in 1925.

FOREST REVENUE.

	12 Months to Dec. 31, 1924.	12 Months to Dec. 31, 1923	12 Months to Dec. 31, 1922.	12 Months to Dec. 31, 1921.	12 Months to Dec. 31, 1920.	12 Months to Dec. 31, 1919.
Timber-licence rentals	$1,180 179 55	$1,283,300 77	$1,390,999 64	$1,193,654 58	$1,654,747 43	1,236,530 41
Timber-licence transfer fees	4,650 00	3,750 00	1,950 00	3,735 00	4,855 00	2,700 00
Timber-licence penalty fees	64,653 05	100,045 86	83,376 60	50,859 19	232,309 85	49,259 95
Hand-loggers' licence fees	2,450 00	5,300 00	6,050 00	9,175 00	6,525 00	7,250 00
Timber-lease rentals	99,974 25	102,062 40	94,392 31	81,840 61	81,989 68	85,101 37
Penalty fees and interest	136 92	72 22	247 77	21 85	12 59	345 10
Timber-sale rentals	19 ,943 01	28,383 49	26,790 12	12,659 91	17,881 40	10,045 26
Timber-sale stumpage	537,786 50	431,007 99	358,984 19	317,488 77	247,234 71	219,012 08
Timber-sale cruising	7,491 04	9,933 97	8,699 50	4,640 39	7,642 80	3,763 49
Timber-sale advertising	2,033 96	3,509 00	2,188 63	1,695 08	2,749 93	1,929 71
Timber royalty and tax	1,521,001 39	1,477,027 24	1,203,884 89	990,326 99	879,003 16	788,746 69
Scaling fees (not Scaling Fund)	1,564 85	1,160 89	3,138 05	2,015 83	25,476 91	64,571 19
Scaling expenses (not Scaling Fund)	753 27	667 53	1,061 94	765 98	5,041 71	13,072 79
Trespass penalties	14,685 27	11,362 99	13,397 91	11,245 86	18,114 34	7,464 12
Scalers' examination fees	430 00	495 00	175 00	455 00	670 00	205 00
Exchange	1,332 26	3,168 40	357 14	291 03	2,519 43	3,550 80
Seizure expenses	654 92	1,559 17	454 35	330 80	530 03	280 12
General miscellaneous	9,392 22	5,907 36	3,135 47	1,972 33	3,363 90	1,055 67
	$3,469,112 46	$3,468,714 28	$3,199,283 51	$2,683,174 20	$3,190,667 87	$2,494,973 75
Grazing fees	14,240 66	13,651 01	8,171 21	11,221 79	15,617 44	9,500 41
Taxation from Crown-grant timber lands	298,973 97	308,041 92	319,410 51	261,896 49	302,557 26	251,264 82
Total revenue from forest sources	$3,782,327 09	$3,790,407 21	$3,526,865 23	$2,956,292 48	$3,508,842 57	$2,755,738 98

Revenue from Logging Operations, 1924.
(Amounts charged.)

Forest District.	Royalty and Tax.	Trespass Penalties.	Seizure Expenses.	Government Scale.		Scaling Fund.		Stumpage.	Total.
				Scaling Expenses.	Scaling Fees.	Scaling Expenses.	Scaling Fees.		
Vancouver & Is.	$1,074,217 23	$5,636 32	$489 65	$213 44	$819 81	$12,872 68	$94,758 05	$ 257,194 76	$1,446,201 94
Cariboo	2,091 79	358 77	.....	.....	.....	.....	.....	2,333 85	4,784 41
Cranbrook	98,186 77	499 07	121 25	26 90	.....	23 68	.....	21,255 76	120,113 43
Prince Rupert	158,834 44	1,338 42	39 87	281 03	1,359 61	1,858 76	8,933 66	141,720 16	314,365 95
Nelson	73,145 41	491 90	19 26	.....	.....	.....	.....	51,211 78	124,868 35
Vernon	35,594 36	563 98	.....	.....	.....	5 00	.....	25,193 51	61,356 85
Fort George	84,249 66	1,677 32	.....	.....	.....	.....	.....	72,858 87	158,785 85
Kamloops	15,751 30	294 44	38 21	27 00	.....	.....	.....	25,302 96	41,413 91
Totals	$1,542,070 96	$10,860 22	$ 708 24	$ 548 37	$2,179 42	$14,760 12	$103,691 71	$597,071 65	$2,271,890 69
Totals, 1923	$1,499,355 83	$25,508 75	$ 746 59	$ 741 56	$1,175 22	$15,743 96	$108,713 66	$467,048 15	$2,119,033 72
Totals, 1922	$1,142,745 76	$14,926 63	$1,326 80	$1,933 72	$1,940 08	$12,407 50	$103,774 90	$375,607 42	$1,661,662 81
Totals, 1921	$1,005,261 61	$14,297 39	$ 516 85	$ 769 08	$1,256 70	$11,396 11	$114,450 43	$396,303 19	$1,544,251 36

FOREST EXPENDITURE, FISCAL YEAR, 1923–24.

Forest District.	Salaries.	Temporary Assistance.	Expenses.	Total.
Headquarters	$ 83,015 00	$ 2,090 96	$ 29,925 33	$115,031 29
Cariboo	5,745 00	1,115 58	8,041 63	14,902 21
Cranbrook	9,405 35	987 08	6,357 18	16,749 61
Kamloops	6,474 52	1,097 03	4,227 66	11,799 21
Nelson	10,821 68	3,534 00	6,674 98	21,030 66
Prince George	11,781 79	1,570 50	5,275 67	18,627 96
Prince Rupert	21,617 06	1,842 00	22,469 58	45,928 64
Vancouver	50,471 29	500 00	67,017 89	117,989 18
Vernon	8,350 00	2,090 96	4,650 64	15,091 60
Totals	$207,681 69	$14,828 11	$154,640 56	$377,150 36
Lumber-trade extension				30,561 26
Reconnaissance, etc				50,109 65
Insect-control				25,262 26
Contingencies				2,673 02
British Empire Exhibition				6,531 86
Grazing: range improvement				7,169 84
Grand total				$499,458 25

In addition to the above-named total the sum of $43,998.94 was expended by the Department under special warrant in the purchase and shipment of lumber in relief of the sufferers from the Japanese disaster.

The sums estimated as being required for the fiscal year 1924-25 were as follows:—

Salaries	$219,828 00
Travelling expenses, Ranger stations, and wireless telephone	46,000 00
Lumber-trade extension	30,000 00
Reconnaissance, etc.	60,000 00
Insect damage: investigation and control	35,000 00
Grazing: range improvement	10,000 00
Total	$400,828 00

In addition to this total, sums were available from the main Lands Department votes for temporary assistance, office supplies, maintenance of launches and autos, and miscellaneous expenses; publicity, general investigations, and contingencies. The sum of $300,000 was also voted as the amount of the contribution of the Government to the Forest Protection Fund.

SCALING FUND.

The Scaling Fund remains in a satisfactory condition. The present fee of 6 cents is not meeting all expenditures and during the nine months the surplus was reduced by $19,000. There still remains a surplus at the end of the year amounting to $21,506.84.

Balance brought down, April 1st, 1923	$ 50,092 72	
Expenditure, fiscal year 1923–24		$141,386 29
Charges, fiscal year 1923–24	132,229 38	
Balance, March 31st, 1924		40,935 81
	$182,322 10	$182,322 10
Balance brought down, April 1st, 1924	$ 40,935 81	
Expenditure, 9 months, April–December, 1924		$108,921 00
Charges, 9 months, April–December, 1924	89,492 03	
Balance, being excess of charges over expenditure		21,506 84
	$130,427 84	$130,427 84

CROWN-GRANT TIMBER LANDS.

	Area of Private Timber Lands (Acres).	Average Value per Acre.
1911	824,814	$ 8 72
1912	874,715	8 60
1913	922,948	9 02
1914	960,464	9 66
1915	913,245	9 55
1916	922,206	9 73
1917	916,726	9 61
1918	896,188	9 60
1919	883,491	9 48
1920	867,921	11 62
1921	845,111	10 33
1922	887,980	11 99
1923	883,344	11 62
1924	654,668	15 22

The extent and value of timber land in the various assessment districts are shown by the following table:—

Assessment District.	Acreage, 1924.	Increase or Decrease in Acreage over 1923.	Average Value per Acre.	Change in Value per Acre since 1923.
Alberni	69,881	+20,544	$24 63	-$0 64
Comox	149,140	-40,130	17 24	+3 19
Cowichan	91,487	-1,430	19 07	- 50
Fort Steele	46,900	+17,168	8 36	- 3 47
Golden	28,049	-53,052	6 12	+1 35
Kettle River	4,914	+6	4 01	+ 09
Nanaimo	82,163	-1,028	15 26	- 1 39
Nelson	17,744	-177,967	7 86	+4 28
Prince Rupert	1,692	+32	23 24	+9 34
Revelstoke	47,861	-749	12 41	- 2 01
Slocan	80,901	No change.	5 10	No change.
Vancouver	2,660	No change.	31 25	No change.
Victoria	31,276	+7,930	23 03	+2 57
Totals	654,668	-228,676	$15 22	+$4 60

FOREST PROTECTION FUND.

The Forest Protection Fund shows a credit balance of $51,375.85 at December 31st, 1924. The collections for nine months amounted to $162,151.56, which will be materially increased during the last three months of the fiscal year.

Patrol expenses were $14,000 less than during the previous year, but on account of severe fire hazard, fire-control was $249,382, as compared with $75,503 for 1923. It is encouraging, however, to note that this expenditure is only 50 per cent. of the 1923 costs and that last year the hazard was closely comparable with 1922.

The following statement shows the standing of the Forest Protection Fund as of December 31st, 1924:—

Collections, fiscal year 1923–24	$197,324 97	
Collections under special levy	92,183 94	
Government contribution	642,315 46	
	$931,824 37	
Less amount transferred to Special Advance Account	59,195 45	
		$872,628 92
Balance (deficit) at April 1st, 1923	$283,616 10	
Expenditure, fiscal year 1923–24 $433,366 32		
Less refunds 13,962 17		
	419,404 15	
Refunds of revenue	567 94	
		703,588 19
Balance in hand		$169,040 73
Balance at April 1st, 1924		$169,040 73
Collections, April–December, 1924 (nine months)	$151,829 05	
Collections, special levy, ditto	10,292 51	
Government contribution, ditto	225,889 66	
		388,011 22
		$557,051 95
Expenditure, April–December, 1924 (nine months)	$517,098 41	
Less refunds	11,422 31	
		505,676 10
Balance in hand		$ 51,375 85

Forest Protection Expenditure.

	Fiscal Years.							
	1917–18.	1918–19.	1919–20.	1920–21.	1921–22.	1922–23.	1923–24.	9 months, April to Dec., 1924.
Patrols and fire prevention	$81,531	$108,860	$135,452	$163,360	$227,738	$202,994	$254,792	$240,426
Tools and equipment.	28,283	68,114	64,563	121,353	118,973	91,812	81,408	22,315
Fires	91,470	50,293	165,688	292,890	106,891	508,992	75,503	249,382
Improvements and maintenance	10,601	18,969	26,555	68,239	17,779	37,609	21,667	4,975
Totals	$211,885	$246,236	$392,25 8	$645,842	$471,341	$841,407	$433,370	$517,098

Expenditure by Districts for Nine Months ended December 31st, 1924.

Forest District.	Patrols and Fire-prevention.	Tools and Equipment.	Fires.	Improvements and Maintenance.	Total.
Victoria	$ 26,806 38	$ 2,836 95	.....	.....	$ 29,643 33
Cariboo	11,935 51	895 37	$ 7,075 35	$ 665 19	20,571 42
Cranbrook	22,218 29	2,217 04	24,168 75	1,514 21	50,118 29
Kamloops	19,072 13	428 13	8,541 39	384 03	28,425 68
Nelson	25,308 47	4,148 42	59,122 53	951 60	89,531 02
Prince George	19,029 63	2,259 13	31,900 62	141 41	53,330 79
Prince Rupert	10,450 44	2,028 89	8,433 05	385 34	21,297 72
Vancouver	52,698 76	6,435 83	99,834 58	760 93	159,730 10
Vernon	12,906 98	1,065 58	10,305 90	171 60	24,450 06
Undistributed	40,000 00	.....	.....	.....	40,000 00
Totals	$240,426 59	$22,315 34	$249,382 17	$4,974 31	$517,098 41

For Twelve Months, April 1st, 1923, to March 31st, 1924.

Forest District.	Patrols and Fire-prevention.	Tools and Equipment.	Fires.	Improvements and Maintenance.	Total.
Victoria	$ 31,127 99	$ 2,068 49	.....	.....	$ 33,196 48
Cariboo	17,265 49	3,416 49	$ 3,668 84	$ 1,855 61	26,206 43
Cranbrook	29,022 01	2,182 92	13,742 23	2,097 88	47,045 04
Kamloops	22,244 68	2,269 50	1,406 55	1,667 65	27,588 38
Nelson	29,901 12	4,444 24	12,695 02	2,404 92	49,445 30
Prince George	23,886 21	2,391 51	4,264 13	812 84	31,354 69
Prince Rupert	16,913 22	1,937 41	4,995 86	1,029 29	24,875 78
Vancouver	108,840 90	14,568 82	33,221 73	6,827 66	163,459 11
Vernon	19,239 92	587 08	1,508 70	2,902 62	24,238 32
Undistributed	5,960 34	.....	.....	.....	5,960 34
Totals	$304,401 88	$33,866 46	$75,503 06	$19,598 47	$433,369 87

FOREST-PROTECTION.

The year 1924 was one of abnormal fire hazard in all sections of the Province. Following the disappearance of snow in the Northern and Southern Interior regions, the forest-cover dried out with extraordinary rapidity and numerous serious fire outbreaks were experienced before May 1st. During the month of June the hazard was, however, appreciably lower, especially in the south-eastern part of the Province, but this region, in common with the rest of the Province, experienced drought conditions and low humidity during the month of July and August, the crisis centring around the week commencing July 29th. To add to the normal hazard, numerous dry electrical storms occurred and many lightning-fires had to be contended with.

The hazard on the Lower Coast in the early part of the season was not abnormally high, but precipitation during the months of May to August was extremely low, rainfall for these months totalling 3.81 inches, as compared with 6.16 inches for the previous year. In this section

conditions were such that many of the operators suspended logging activities during the months of June, July, and August. During this period no less than forty-four of the major Coast operations were closed down, resulting in the idleness of approximately 60 per cent. of the logging machinery. This shut-down greatly minimized the fire risk from logging operation and was a most important factor in reducing fire occurrence and fire loss. On the other hand, all reports indicate that the number of tourists and campers using the woods was the heaviest ever experienced in the Province. Rainfall became general throughout the Province about September 10th and there was no subsequent occurrence of serious hazard.

Following the theories recently accepted by various Forest Protective Associations and agencies, that the measure of fire hazard in any season is determined largely by the number of days of low relative humidity, or what have previously been known as bad fire days, rather than sustained periods of drought and high temperature, further studies were carried out by the Branch with a view to obtaining definite data regarding the relation between relative humidity and fire occurrence and fire spread. Hygro-thermographs were placed at the following points: Vernon, Prince George, Williams Lake, Cranbrook, Smithers, Nanaimo, and Nelson; and, in addition, all Rangers were equipped with sling psychrometers. Humidity conditions as indicated by these instruments were used as a basis for issuing fire warnings, strengthening patrols, and to a limited extent for guidance in fire suppression.

Daily readings of the hygro-thermographs were telegraphed to the Director of the Dominion Meteorological Station at Gonzales Heights, Victoria, for comparison with weather reports obtained by him from other sources, with a view to their co-ordination in preparing weather forecasts. It is the intention of the Department to continue to send these reports to the Meteorological Station in 1925. They will be considered with other meteorological data and, on the combined basis, daily weather probabilities sent out. It is further planned to broadcast these weather reports daily during the fire season from the Department's Wireless Station at Vancouver, Myrtle Point, and Thurston Bay for the benefit of the general public, and especially those operating logging camps. A day's shut-down during extreme low conditions may save many thousands of dollars in fire loss. There is little doubt that such warnings, if taken advantage of, will be extremely helpful in reducing fire occurrence.

FIRE OCCURRENCE.

The number of fires occurring in the Province (2,174) in 1924 was the largest reported since the organization of the Forest Protection Force, with the exception of 1922, when no less than 2,591 fires were reported. This year is in sharp contrast to the preceding one, when 1,530 fires occurred.

Of the 2,174 fires in 1924, 767, or 35.28 per cent., were extinguished before they had reached an area exceeding one-quarter of an acre; 782, or 35.97 per cent., were extinguished under 10 acres; and 625, or 28.75 per cent., exceeded 10 acres in size; 1,315, or 61 per cent., fires were extinguished by the patrol forces without help or additional cost. Further analysis shows that 1,823 fires, or 83.84 per cent., caused damage less than $100 in extent; 259, or 11.92 per cent., caused damage between $100 and $1,000; and 92, or 4.24 per cent., destroyed over $1,000 worth of property. These standards, while not as favourable as attained in the previous year, are an improvement on the results obtained in 1922, which from a fire occurrence and hazard viewpoint is comparable to 1924.

The increase in the number of fires in 1924 presents a striking illustration of the relationship between "fire occurrence" and the seasonal conditions; while this, naturally, is very apparent in the case of fires due to unpreventable causes, such as lightning, it is also true in the case of fires due to purely accidental causes, such as smokers, campers, etc. It is true that weather conditions do not of themselves cause fires except in the case of lightning, but they do exert a most important contributory influence in fire occurring from other agencies, inasmuch as when weather conditions are adverse, many potential fires, such as cigarette-stubs and lighted matches discarded by smokers, camp-fires, sparks from railway-locomotives, etc., left unextinguished, die out, and inversely, when weather conditions are favourable for the rapid spread of fires, these become real conflagrations which spread, burn until discovered, and must be extinguished by human agency.

FIRES, 1924, CLASSIFIED BY SIZE AND DAMAGE.

Forest District.	TOTAL FIRES.		UNDER ¼ ACRE.			¼ ACRE TO 10 ACRES.			OVER 10 ACRES IN EXTENT.			DAMAGE.		
	No.	Per Cent. of Total Fires in Province.	No.	Per Cent. of Total Fires in District.	Per Cent. of Total Fires in this Class.	No.	Per Cent. of Total Fires in District.	Per Cent. of Total Fires in this Class.	No.	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.
Cariboo	129	5.93	18	13.95	2.34	35	27.13	4.47	76	58.92	12.16	78	41	10
Cranbrook	238	10.95	112	47.0	14.61	84	35.3	10.75	42	17.7	6.72	208	21	9
Kamloops	173	7.96	75	43.3	9.78	64	36.9	8.18	34	19.8	5.44	155	13	5
Nelson	411	18.90	197	47.9	25.68	136	33.1	17.39	78	19.0	12.48	347	48	16
Prince George	281	12.93	38	13.5	4.95	112	39.9	14.33	131	46.6	20.96	224	36	21
Prince Rupert	156	7.18	45	29.0	5.86	48	30.3	6.14	63	40.7	10.08	131	16	9
Vancouver	597	27.46	252	42.0	32.86	194	33.0	24.80	151	25.0	24.16	515	64	18
Vernon	189	8.69	30	15.9	3.92	109	57.6	13.94	50	26.5	8.00	165	20	4
Totals	2,174	100.0	767	....	100.0	782	....	100.0	625	....	100.0	1,823	259	92
Per cent	100.0	....	35.28	....	....	35.97	....	....	28.75	....	....	83.84	11.92	4.24
Totals, 1923	1,530	....	673	....	....	519	....	....	338	....	....	1,396	82	52
Per cent	100.0	....	43.99	....	....	33.92	....	....	22.09	....	....	91.24	5.36	3.40
Totals, 1922	2,591	....	637	....	....	909	....	....	1,045	....	....	2,171	253	167
Per cent	100.0	....	24.6	....	....	35.1	....	....	40.3	....	....	83.8	9.8	6.4

NUMBER AND CAUSES OF FIRES, 1924.

Forest District.	Lightning.	Campers and Travellers.	Railway Operation.	Railways under Construction.	Smokers.	Brush-burning not Railway-clearing.	Public Road-construction.	Industrial Operation.	Incendiary.	Miscellaneous (Known Cause).	Unknown Causes.	Total.	Per Cent. of Total Fires in Province.
Cariboo	6	53	2	..	8	9	..	..	37	..	14	129	5.9
Cranbrook	37	43	45	..	24	18	2	1	4	9	55	238	10.9
Kamloops	38	10	71	..	9	18	1	1	6	11	8	173	7.9
Nelson	132	26	114	..	45	58	5	7	2	10	12	411	18.9
Prince George	6	80	37	..	36	37	4	4	21	27	29	281	12.9
Prince Rupert	4	42	5	..	20	21	1	10	27	6	20	156	7.3
Vancouver	17	111	29	..	118	69	3	109	12	41	88	597	27.5
Vernon	67	17	25	..	42	13	3	2	4	5	11	189	8.7
Totals	307	382	328	..	302	243	19	134	115	107	237	2,174	100.0
Per cent	14.1	17.6	15.1	..	13.9	11.2	0.9	6.1	5.3	4.9	10.9	100.0	

FIRES, 1924, CLASSIFIED BY PLACE OF ORIGIN AND COST OF FIRE-FIGHTING.

Forest District.	Total Fires.	Originated on Vacant Crown Lands and Lands paying F.P. Tax.	*Originated on Lands not paying F.P. Tax.*	Extinguished without Cost.			Cost Money to extinguish.			Total Cost of fighting Fire.		Average Cost per Fire.
				No.	Per Cent. of Total Fires in District.	Per Cent. of Total Fires in Province.	No.	Per Cent. of Total Fires in District.	Per Cent. of Total Fires in Province.	Dollars.	Per Cent. of Total spent in fighting Fires in Province.	Dollars.
Cariboo	129	85	44	81	62.8	3.72	48	37.2	2.21	7,075 35	2.84	54 84
Cranbrook	238	32	206	143	60.0	6.58	95	40.0	4.37	24,168 75	9.69	101 55
Kamloops	173	64	109	130	75.0	5.98	43	25.0	1.98	8,541 39	3.44	49 37
Nelson	411	152	259	234	56.9	10.76	177	43.1	8.15	59,122 53	23.70	143 85
Prince George	281	85	196	147	52.3	6.76	134	47.7	6.16	31,900 62	12.81	113 52
Prince Rupert	156	64	92	104	67.0	4.78	52	33.0	2.39	8,433 05	3.38	54 06
Vancouver	597	236	361	367	61.0	16 88	230	39.0	10.58	99,834 58	40.00	167 22
Vernon	189	62	127	109	57.6	5.02	80	42.4	3.68	10,305 90	4.14	54 50
Totals	2,174	780	1,394	1,315	....	60.49	859	....	39.51	249,382 17	100.00	114 71
Per cent	100.0	35.88	64.12	60.49	....	....	39.51	....	....	.....	....	.....
Totals, 1923	1,530	541	989	1,086	....	70.98	444	....	29.02	72,706 16	100.00	47 53
Per cent	100.0	35.36	64.64	70.98	....	...	29.02	....	....	.....	....	.....
Totals, 1922	2,591	766	1,826	1,665	....	64.29	926	....	35.71	479,800 85	100.00	185 17
Per cent	100.0	29.5	70.5	64.29	....	....	35.71	....	....	.....	....	... .

FIRE DAMAGE.

The total area burned over by forest fires in 1924 was 402,214 acres, 0.3 per cent. of area patrolled. While this exceeded by nearly three times the total area burned over in 1923, it was only approximately 25 per cent. of the area burned in 1922.

The merchantable timber destroyed is estimated at 103,421 B.M., as against 49,380 B.M. for 1923 and 611,935 B.M. for 1922. Valuable reproduction destroyed by fire amounted to 106,019 acres, as against an area of 12,807 acres for 1923 and 210,474 acres for 1922.

Damage to other forms of property, which includes partially manufactured forest products, logging machinery, etc., amounted to $540,291, as compared with $617,649 for 1923 and $693,016 for 1922.

DAMAGE CAUSED BY FOREST FIRES, 1924.

Forest District.	MERCHANTABLE TIMBER DESTROYED OR DAMAGED.				VALUABLE REPRODUCTION.		CUT-OVER LAND, UNMERCHANTABLE TIMBER, OLD BURN, NOT RESTOCKING.			GRAZING RANGE.		AREA OF SLASH BURNED.		GRAND TOTALS.					
	Area.	Quantity Killed.	Quantity salvable.	Net Stumpage Loss.	Area.	Estimated Present Damage.	Area.	Quantity killed.	Estimated Damage.	Area.	Damage.	Area burned.	Cost to Department.	Area.		Quantity.		Damage.	
	Acres.	M. Ft. B.M.	M. Ft. B.M.		Acres.		Acres.	M. Ft. B. M.		Acres.		Acres.		Acres.	Per Cent.	M. Feet B.M.	Per Cent.		Per Cent.
Cariboo	164	335	.....	$ 530	936	$ 3,649	30,191	....	$57,961	20,073	$1,002	116	.....	51,480	12.80	335	0.16	$ 63,142	9.49
Cranbrook	10,495	14,663	121	16,661	21,268	49,095	4,965	....	1,129	2,536	125	722	.....	39,986	9.94	14,663	7.07	67,010	10.07
Kamloops	758	2,307	942	3,253	2,415	5,747	2,890	20	4,634	161	38	823	$ 8	7,047	1.75	2,327	1.13	13,672	2.05
Nelson	3,846	13,701	5,148	11,372	23,744	62,804	44,062	63	39,590	1,412	107	3,494	.....	76,558	19.04	13,764	6.63	113,873	17.13
Prince George	4,955	23,795	1,347	34,012	31,642	55,512	69,178	930	15,090	1,610	16	2,174	261	109,559	27.24	24,725	11.91	104,630	15.76
Prince Rupert	1,269	10,434	3,892	5,800	1,183	2,609	13,347	...	14,262	2,443	112	286	.....	18,528	4.61	10,434	5.03	22,783	3.42
Vancouver	5,720	138,708	90,258	105,634	20,594	92,411	41,234	251	57,778	815	38	18,795	.....	87,158	21.67	138,959	66 90	255,861	38.46
Vernon	1,247	2,310	1,124	2,240	4,237	13,866	4,963	134	7,908	1,156	93	295	.....	11,898	2.95	2,444	1.17	24,107	3.62
Totals	28,454	206,253	102,832	$179,502	106,019	$285,693	210,830	1,398	$198,352	30,206	$1,531	26,705	$269	402,214	100.0	207,651	100.0	$ 665,078	100.0
Per cent.	7.07	99.33	49.86	26.99	26.36	42.95	52.42	0.67	29.83	7.51	0.23	6.64	....	100.0	.....	100.0	.....	100.0	.....
Totals, 1923	25,941	87,271	37,891	$ 41,102	12,807	$ 32,401	85,793	100	$ 200	9,298	$ 535	23.762	.....	157,601	100.0	87,371	100.0	$ 74,238	100.0
Per cent.	16.46	99.89	43.37	55.38	8.12	43.64	54.46	0.11	0.26	5.89	0.72	15.07	.....	100.0	.....	100.0	.....	100.0	.....
Totals, 1922	174,988	728,941	117,006	$955,772	210,474	$569,303	833,473	1,000	$1,210	245,941	$5,015	103,700	$ 106,343	1,568,585	100.0	729,941	100.0	$1,531,300	100.0
Per cent.	11.2	99.9	16.03	62.4	13.4	37.2	53.1	0.1	0.1	15.7	0.3	6.6	.....	100.0	....	100.0	.....	100.0	.....

DAMAGE TO PROPERTY OTHER THAN FORESTS, 1924.

Forest District.	Products in Process of Manufacture.	Buildings.	Railway and Logging Equipment.	Miscellaneous.	Total.	Per Cent. of Total.
Cariboo	.....	$ 1,725	$ 800	$ 1,170	$ 3,695	0.68
Cranbrook	$37,956	32,650	5,258	681	76,545	14.17
Kamloops	1,870	885	1,200	.....	3,955	0.74
Nelson	46,228	64,980	7,020	28,479	146,707	27.15
Prince George	2,816	37,870	320	775	41,781	7.73
Prince Rupert	2,000	470	.....	306	2,776	0.52
Vancouver	70,394	28,410	128,462	7,385	234,651	43.43
Vernon	375	28,200	12	1,594	30,181	5.58
Totals	$161,639	$195,190	$143,072	$ 40,390	$540,291	100.00

COMPARISON OF DAMAGE CAUSED BY FOREST FIRES IN THE LAST SEVEN YEARS.

	1924.	1923.	1922.	1921.	1920.	1919.	1918.
Total number of fires	2,174	1,530	2,591	1,330	1,251	1,141	910
Area burned (acres)	402,214	157,601	1,568,585	145,838	389,846	433,797	140,085
Standing timber destroyed or damaged (M. ft. B.M.)	207,651	87,371	729,941	68,476	229,253	287,520	42,886
Amount salvable (M. ft. B.M.)	102,832	37,891	117,006	39,553	49,575	93,559	22,387
Damage to forests	$665,078	$74,238	$1,531,300	$97,332	$485,962	$393,183	$25,930
Damage to other forms of property	540,291	617,649	693,016	195,221	473,900	345,787	200,335
Total damage	$1,205,369	$691,887	$2,224,316	$292,553	$959,863	$738,970	$226,265

FIRE-FIGHTING EXPENDITURES.

Fire-fighting expenditures reached the sum of $249,382, as compared with $72,706 for 1923, $479,801 for 1922, and $146,527, the average for the past ten years.

In addition to the sum expended by the Department fighting fires, private interests spent approximately $153,515, making a total expenditure for fire-suppression purposes of $402,897 for the Province, or an average of $185 per fire.

The total estimated damage caused by forest fires, including fire-control expenditures, amounted to $1,608,266.

FIRE CAUSES.

Human agencies were again responsible for no less than 85.9 per cent. of the fires which occurred in the Province; lightning, the only unpreventable cause, being responsible for 14.1 per cent. Analysis of the tables illustrating fire causes reveals that, with the solitary exception of "industrial operations," there was a marked increase in the number of fires due to all other human agencies, such as campers, smokers, etc.

Reference has already been made to the minimized risk due to the suspension of logging operations in the Lower Coast during the fire season. There is no doubt that this shut-down, while due to economic reasons rather than the result of premediated action in the interests of forest-protection, was the principal factor in reducing fire occurrence from industrial causes. It unquestionably kept down very substantially the damage previously suffered by Coast operators, and certainly bears out the oft-expressed conviction that during a season of abnormal hazard suspension of operations is advisable in the hazardous areas of the Lower Coast if disastrous conflagrations are to be avoided.

NUMBER AND CAUSES OF FOREST FIRES FOR THE LAST NINE YEARS.

Causes.	1924.	1923.	1922.	1921.	1920.	1919.	1918.	1917.	1916.
Lightning	307	274	246	164	304	115	134	48	67
Campers and travellers	382	262	626	308	246	310	158	209	268
Railway operation	328	199	332	283	227	146	104	335	121
Railways under construction	....	....	....	2	1	22	1	....	....
Smokers	302	180	....	....	....	....	....	....	....
Brush-burning (not railway-clearing)	243	154	355	136	96	97	100	48	148
Public road-construction	19	12	22	20	7	5	2	5	12
Industrial operations	134	170	203	119	104	129	80	59	59
Incendiary	115	35	69	40	32	21	15	13	22
Miscellaneous known	107	71	202	64	69	140	72	55	19
Unknown causes	237	173	536	204	165	156	224	214	148
Totals	2,174	1,530	2,591	1,330	1,251	1,141	910	986	864

Burning Permits, 1924.

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.
Cariboo	420	1,786	5	....	73	521	....	....	3	81	....	....	13	75	....	....	509	2,463	5	....
Cranbrook	289	568	....	....	20	1,050	....	....	8	471	2	....	3	36	....	....	320	2,125	2	....
Kamloops	435	477	8	2	10	29	....	....	9	2	....	....	1	....	....	....	455	508	8	2
Nelson	670	1,041	8	6	15	120	2	....	5	732	....	2	14	284	5	2	704	2,157	15	10
Prince George	1,228	3,873	21	7	36	63	1	....	6	2	....	....	28	85	2	1	1,298	4,023	24	8
Prince Rupert	1,226	3,562	13	8	15	20	....	....	10	57	....	1	7	40	....	1	1,258	3,679	13	10
Vancouver	3,798	7,503	40	18	12	1,225	....	....	5	1,660	....	....	15	164	1	....	3,830	10,552	41	18
Vernon	336	2,165	3	....	32	757	1	....	3	551	....	....	3	58	....	....	374	3,531	4	....
Totals	8,402	20,975	98	41	213	3,785	4	....	49	3,556	2	3	84	722	8	4	8,748	29,038	112	48
Per cent	96.05	72.24	87.50	85.42	2.43	13.03	3.57	....	0.56	12.25	1.79	6.25	0.96	2.48	7.14	8.33	100.0	100.0	100.0	100.0
Totals, 1923	10,983	35,028	71	41	274	7,786	6	4	141	4,619	4	2	156	998	6	2	11,554	48,431	87	49
Per cent	95.06	72.31	72.31	83.67	2.37	16.08	6.9	8.17	1.22	9.54	4.6	4.08	1.35	2.07	6.9	4.08	100.0	100.0	100.0	100.0

PUBLIC EDUCATION.

It has long been realized that the solution of the fire-prevention phase of the forest-fire problem is largely an educational process, and since the establishment of the Forest Service in the Province it has been the aim to carry out an educational campaign in the interests of forest-fire prevention vigorous and wide enough in scope to arouse every citizen and every user of the forest to the realization of the fact that it is his and his children's heritage he is risking by his careless match or camp-fire.

The educational programme in 1924 was the most diverse and comprehensive yet attempted. It embraced many forms of written appeal, including, in addition to the usual legal posters and signs calling attention to the provisions of the fire law, newspaper advertising and a variety of specially designed posters, campers' guides, leaflets, road-signs, etc.

The week of April 27th to May 3rd was proclaimed "Save the Forest Week" by His Excellency the Governor-General of Canada. During this week an intensive publicity campaign was put on by this Branch in the interests of forest-protection, in which every available officer took part.

The campaign included special lectures illustrated by motion pictures, lectures to all school-children of the Province, Boy Scout rallies, etc. An appeal to the general public to co-operate in making this campaign effective met with a most encouraging response. Window displays and free advertising were contributed by many firms. Moving-picture theatres exhibited forest-protection slides and the film "Red Enemy," and also offered the use of their theatres for forest-protection lectures. In numerous other ways assistance was also given by public-spirited citizens with a view to make the object sought by the originators of forest-protection week possible of accomplishment.

Many Service Clubs and similar organizations were addressed on the subject of forest-protection by members of the staff. Speeches on forest-protection topics were broadcasted each evening from the Department Radio Station at Vancouver. During the week, through the co-operation of the R.C.A.S., an aeroplane flight over the various settlements and logging camps on the Coast was made and forest-protection propaganda in the form of leaflets distributed from the air.

An essay competition was held for school-children on the subject of "Forest Fires, Their Effect, and How to Prevent Them"; gold, silver, and bronze medals and certificates being offered as prizes. A very large number of essays were received, many of which were of a very high grade. This competition undoubtedly resulted in bringing the lesson of forest-protection into thousands of homes in the Province in a more effective way than it would be brought in any other way.

Camp-sites.—With a view to concentrating the risk and preventing fire-setting by campers, a number of additional Forest Branch camp-sites were established during the season at various places throughout the Province. Forest Branch camp-sites have been the subjects of much favourable comment on the part of the users. At several of the camp-sites camp registers were kept, and the written comment of the visitors contained therein certainly indicates that this form of forest-protection publicity will undoubtedly bring in commensurate results in reducing the risk from campers' fires wherever they are established.

FIRE-LAW ENFORCEMENT.

After making due allowance for the effect of abnormal weather conditions on fire occurrence, the large increase in the number of fires in 1924 as compared with 1923 and years previous to 1922, is, to say the least, disconcerting; moreover, this increase occurred in a year which saw probably the greatest efforts of fire-prevention propaganda yet attempted in the Province.

The continued annual occurrence of large numbers of forest fires is not, however, a situation peculiar to British Columbia; in the neighbouring States to the south more fires occurred in 1924 than in any year since forest-protection was placed upon an organized basis. No less than 8,454 fires occurred, of which over 70 per cent. were man-caused as reported by the Western Forestry and Conservation Association. Forest fires have not decreased in proportion to the progress made in other forest-protective endeavours, and it is felt that more rigorous enforcement of the fire law in respect to careless fire-setting is essential if advancement in fire-prevention is to be achieved. This was particularly emphasized at the fourteenth annual meeting of the

Western Forestry and Conservation Association held in Vancouver, December 2nd to 4th, 1924, when the following resolution was passed:—

"The discouraging number of man-caused fires indicates the existence in our population of a careless and criminal minority which cannot be reached by any argument except vigorous prosecution. We therefore propose the development of a forest constabulary assigned directly to enforcement of our forest-fire laws to the end that man-caused fires may be reduced."

The recommendation embodied in this report is worthy of serious consideration in so far as its adoption may be feasible in British Columbia. Prosecution procedure is a matter for which the ordinary forest officer has little aptitude. It would seem advisable, therefore, with a view to ensuring that prosecution for fire-law violation will be made where circumstances warrant, that special training be afforded forest officers in this work, and the forest-protection staff be augmented by one or more men experienced in the technique of securing clues and preparing evidence. It is obvious that if we are to stop fire-setting, whether due to carelessness or rank incendiarism, we cannot depend on education alone. Strong disciplinary measures are the only cure for the wilful and the criminally careless.

PROSECUTIONS FOR FIRE TRESPASS, 1924.

Forest District.	Information laid.	Failure to equip Donkey or Camp with Fire-fighting Tools.	Contravention of Section 112 of "Forest Act."	Contravention of Section 100 of "Forest Act."	Operating Open Burner without Permit.	Contravention of Section 114 of "Forest Act."	Burning without Permit.	Failure to report Fire.	Incendiary.	Leaving Camp-fires burning.	Refusing to fight Fire.	Fines.		Served Sentence in Gaol.	Suspended Sentence.	Cases dismissed.	Cases pending.	Cases withdrawn.
												No.	Amount.					
Cariboo.....	1	..	..	..	..	..	..	..	..	..	1	..	.....	..	..	1	..	..
Cranbrook....	4	..	..	..	..	..	1	..	..	3	..	2	$375 00	..	2	..	..	..
Kamloops.....	1	..	..	..	..	..	1	..	..	..	..	1	25 00	..	..	..	..	..
Nelson	8	..	..	..	..	1	6	..	..	..	1	2	50 00	1	..	5	..	..
Prince George .	15	..	..	..	..	..	9	..	..	1	5	9	225 00	1	..	5	.	..
Prince Rupert .	..	..	..	..	..	..	..	..	..	..	..	..	.....	..	..	..	..	..
Vancouver.....	15	..	1	..	..	1	11	..	..	2	..	10	350 00	..	1	2	..	2
Vernon.....	1	..	..	..	..	..	..	..	..	1	..	..	. . ....	..	..	1	..	..
Totals.....	45	..	1	..	..	2	28	..	..	7	7	24	$1,025 00	2	3	14	..	2
Totals, 1923.	83	..	..	..	1	9	35	4	2	18	14	45	$1,260 00	..	13	15	7	3

HAZARD REDUCTION.

Dangerous Debris.—The total area of slash burned over during the close season and the number of burning permits issued shows a considerable decrease as compared with the years 1923 and 1922. This was due in part to the occurrence of favourable burning conditions, which permitted a larger amount of the clearing to be done and for which no record is kept prior to the announcement of the fire season.

Industrial Operations.—The number of locomotive and donkey engines operating in the woods was greatly reduced during the greater part of the fire season of 1924, but compliance, on the part of the firms that did operate, with the regulations regarding maintenance of fire-preventive appliances was very satisfactory. A large quantity of additional fire-fighting equipment was purchased by logging companies, which included steel railway tank-cars equipped with high-power steam-pumps, portable gasolene fire-pumps, hand tank pumps, and in addition large quantities of the usual fire-fighting tools, such as mattocks, axes, shovels, etc.

One additional spark-arrester for donkey-engines was tested by the Department, in conjunction with the Boiler Inspection Department, and approved, making a total of seven types of arresters for locomotives and donkey-engines which have now received official registration.

FIRE-CONTROL.

The general plan of organization followed in previous years was continued in 1924. Emergency fire-organization charts have now been compiled for every section of the Province. These charts are an inventory of the resources, human and material, available in each section for fire-fighting purposes. The work of developing this emergency fire organization into an efficient

fire-fighting machine was continued with a view to not only securing prompt and efficient action on every fire, but also in minimizing fire-suppression expenditures.

It is gratifying to note that a further substantial increase was made in enrolment of Honorary Fire Wardens and Fire Prevention Officers. The number accepting these appointments in 1924 being 894, as against 650 for the previous year. The interest taken by the public generally on the growth of this branch of the fire-protection staff is an encouraging augury for future progress not only in fire-fighting efficiency, but also in fire-prevention.

FIRE-DETECTION.

The 1924 fire season again demonstrated the value of permanent lookouts established on prominent mountain points for rapid fire-detection purposes.

A new standard lookout was constructed on Mount Swansea, in the Cranbrook Forest District, which has a commanding view of all the country tributary to the headwaters of the Columbia and Kootenay Rivers.

The existing lookouts on B.X. and Little White Mountains, in the Vernon Forest District, were also substantially improved. In addition, the Patrol Force established many lookout points this year on high points of lands, which are visited during the course of the day's patrol and from which a commanding view of the patrol area is obtained. No permanent fixtures are placed at such points, but they act as temporary lookouts until replaced by the permanent type on higher and more commanding elevations.

Increased service from the auxiliary Fire Prevention Force and Honorary Fire Wardens has greatly strengthened the work of prompt fire-detection.

By arrangement with the R.C.A.F., flying-boats of the Jericho Beach Air Station were utilized on a small scale again this year for fire-detection and reconnaissance purposes on the Lower Coast.

COMMUNICATIONS.

The Department's radio-telephone system again proved its indispensability, the number of messages sent, including relays, totalling 7,026, and words 263,980. Minor alterations to the receiving part of the sets resulted in greater range and better receptivity being obtained. A new direct-connected crude-oil-power unit was installed at Myrtle Point Station, replacing a gasolene-engine, belt-driven generator set, and is giving much more satisfactory results at a considerably lower hourly operating cost.

Efficient service was obtained over the various land telephone-lines in the Province operated by the Department for forest-protection purposes. The various lines were maintained in good order and some minor extensions made.

MECHANICAL TRANSPORT AND FIRE-FIGHTING EQUIPMENT.

Transportation service was obtained from Forest Branch owned mechanical transportation equipment as follows:—

Launches.

Year.	Number of Units.	Total Miles run.	Average Miles per Unit.	Total Cost.	Average Cost per Mile.
1924	43	119,703	2,784	$16,094	$0.134
1923	40	106,500	2,662	19,493	.183
	3*	13,203*	122*	$ 3,399†	$0.049†

Motor-cars.

1924	59	327,495	5,551	$14,105	$0.043
1923	52	275,000	5,288	13,100	.047
	7*	52,495*	263*	$ 1,005*	$0.004†

Railway Speeders.

1924	16	45,696	2,856	$1,149	$0.025
1923	15	38,500	2,566	1,614	.041
	1*	7,196*	290*	$ 475†	$0.016†

*Increase. †Decrease. Does not include depreciation.

Departmental transportation costs for 1924 were lower than in the year previous, taking into consideration the increase in total mileage, in average mileage per unit, and in the number of units operated. It is believed that these costs and figures will compare very favourably when set against corresponding data available from private concerns operating similar equipment in the Province.

There are now three crude-oil-engine-powered vessels in the service—the "B.C. Forester," the headquarters launch of the Vancouver Forest District, which was placed in commission early in the year; the launch "Euclataw," which was equipped with a new engine, replacing one worn out in service; and the launch "Scaler." All of these launches are giving satisfactory engine service at a considerably less operating cost than gasolene or distillate engines of similar power.

Fire-fighting Equipment.—The value of portable fire-pumps in combating fires was again demonstrated, the hours run totalling 4,063, equivalent to a quantity of over 6,000,000 gallons of water pumped. A new type of light-weight pump was tested out in the field. This pump, which weighs only about 40 lb., is mounted on a tripod, one leg of which is used as a suction-pipe. Two of these units were purchased and through the season demonstrated their usefulness and portability under varying conditions at a low operation and maintenance cost.

Fire-hose to meet requirements for replacements of that expended and worn out in service and for additional fire units was purchased. Various samples offered (some fifteen in all) were given a rigid test with a view to determining the hose best suited for our needs. The grade possessing the best qualities was selected and purchased. Reports of its performance from the field indicate that the choice was amply justified.

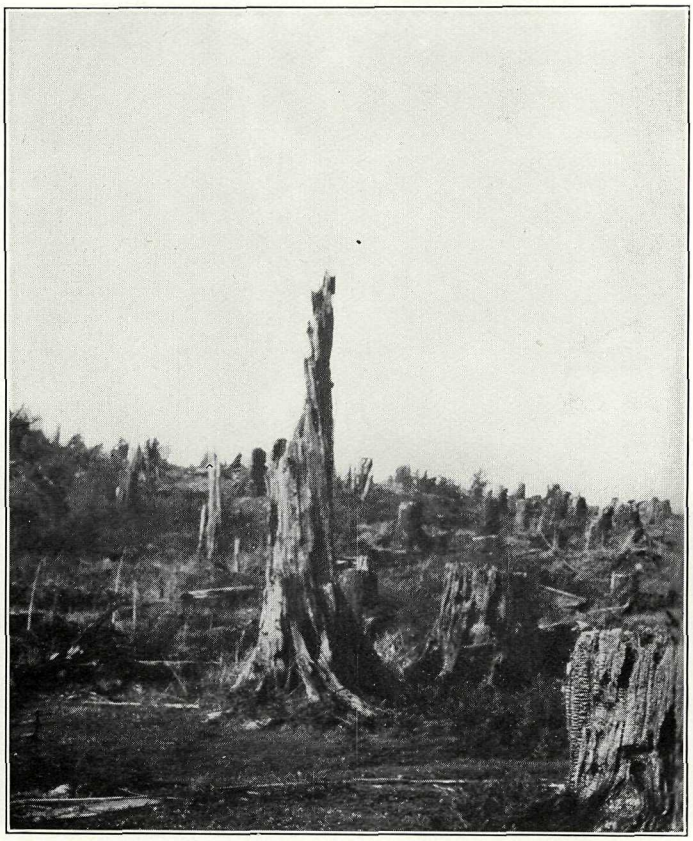
The old-type screw hose-couplings are being replaced, as the hose wears out, by a new type instantaneous coupling specially developed for forest-fire use. These couplings permit either end of the hose to be used, do away with loose joints and hose-wrenches, and save considerable time in laying and taking up hose at a fire.

A change in design of the 5-gallon hand tank pump in use was made for increased portability and usefulness. Numerous instances since it was adopted have proved the value of this piece of equipment as an adjunct to the equipment carried by patrolmen.

EQUIPMENT, IMPROVEMENTS, AND MAINTENANCE.

CARIBOO.

Equipment—	
Four Ford cars	$ 2,580 00
Eight hand tank pumps	109 00
Fire-fighting tools	594 00
Portable telephone	112 00
Hygro-thermograph and screen	163 00
Three sling psychrometers	36 00
Total	$ 3,594 00
Improvements—	
Williams Lake Garage	$ 525 00
Quesnel Lake Boat-house	525 00
Lac la Hache Camp-site	169 00
Cottonwood Camp-site	13 00
Total	$ 1,232 00
Maintenance—	
Mount Begbie Lookout Cabin	$ 75 00
Quesnel Lake Boat-house	33 00
Carried forward	$ 108 00



Result of repeated fires—a statue to destruction.
Compare with Frontispiece.

CARIBOO—*Continued.*

Brought forward	$ 108 00
Maintenance—*Continued.*	
Bear Lake Ranger Station Cabin	26 00
Mount Begbie Lookout Trail	22 00
Canim Lake Boat-house	17 00
Miscellaneous	59 00
Total	$ 232 00

CRANBROOK.

Equipment—	
Five Ford cars	$ 3,016 00
Eighteen hand tank pumps	276 00
One Evinrude pump (2-cylinder)	376 00
One Evinrude pump (single cylinder)	252 00
Hose for fire-fighting pumps	450 00
Fire-fighting tools, etc.	547 00
One hygro-thermograph and screen	163 00
Four sling psychrometers	48 00
Total	$ 5,128 00
Improvements—	
Bridge Creek Trail	$ 216 00
Sheep Creek Trail	900 00
Ward Creek Trail	725 00
Swansea Mountain Lookout and Telephone Line	1,593 00
Flathead Road	100 00
Camp-sites	415 00
Total	$ 3,949 00
Maintenance—	
Moyie Mountain Lookout	$ 111 00
Elk Valley Telephone Line	325 00
Camp-sites	135 00
Whitefish Creek Trail	60 00
Weary Creek Trail	80 00
Summit Creek Trail	105 00
Phillips Creek Trail	75 00
Wigwam River Trail	87 00
Casey Mountain Telephone Line	75 00
Flathead Trail	244 00
Lodgepole Creek Trail	50 00
St. Mary River Trail (East Fork)	65 00
Kootenay River Trail	150 00
Goat River Trail	60 00
Corbin Trail	54 00
Wildhorse Trail	80 00
Miscellaneous	42 00
Total	$ 1,798 00

KAMLOOPS.

Equipment—	
Three sling psychrometers	$ 36 00
One Ford car	610 00
Three boats and shelter	139 00
One Evinrude outboard motor	124 00
One canoe	151 00
Eight hand tank pumps	125 00
Fire-fighting hose	112 00
Fire-fighting tools	61 00
Total	$ 1,353 00
Improvements—	
Myrtle Crossing–Clearwater Trail	$ 351 00
Dunn Lake Camp-site	72 00
Clearwater Camp-site	34 00
Bear Creek Camp-site	31 00
Canyon Ranger Station Cabin	24 00
Shelters for boats	52 00
Miscellaneous	16 00
Total	$ 580 00
Maintenance—	
Barriere–Adams Lake Trail	$ 105 00
North Thompson–Columbia River Trail	64 00
Adams Lake–Seymour Arm Trail	118 00
Canoe River Trail	116 00
Adams River Wagon-road	416 00
Upper Thompson River Trail	158 00
Blue River Ranger Station Cabin	114 00
Seymour Arm Scow	55 00
Grizzley Mountain Trail	72 00
Avola Ranger Station Cabin	60 00
Clearwater Trail	142 00
Green Mountain Trail	64 00
Mica Lake Trail	98 00
Rawhide Trail	44 00
Raft River Trail	50 00
East Barriere Lookout Trail	36 00
Goldstream Ranger Station Cabin	46 00
Clearwater–Blue River Trail	36 00
Barriere Forks–Brennan Creek Trail	28 00
Blucher Mountain Trail	36 00
Miscellaneous	387 00
Total	$ 2,245 00

NELSON.

Equipment—	
Four Ford cars	$ 2,506 00
One Evinrude pump	376 00
One Pacific Ross pump	315 00
Carried forward	$ 3,197 00

NELSON—*Continued.*

Brought forward	$ 3,197 00
Equipment—*Continued.*	
Fourteen hand tank pumps	212 00
Hose for fire-fighting pumps	1,600 00
One hygro-thermograph and screen	163 00
Six sling psychrometers	72 00
Total	$ 5,244 00
Improvements—	
Fry Creek Trail	$ 1,043 00
Campbell Creek Trail	211 00
Davis Creek Trail	110 00
Little Slocan Telephone Line	136 00
Pingston Creek Trail	120 00
Saddle Mountain Trail	127 00
Wilson Creek Trail	285 00
Midge Creek Trail	60 00
Big Sheep Trail	116 00
Duck Lake Cabin	30 00
Salmon River Camp-site	62 00
Miscellaneous	61 00
Total	$ 2,361 00
Maintenance—	
East River Cable Crossing	$ 35 00
Howser–Lardeau Telephone Line	41 00
Miscellaneous	76 00
Total	$ 152 00

PRINCE GEORGE.

Equipment—	
Three cars	$ 1,954 00
One Elto outboard motor	171 00
Two new boats	110 00
One gasolene-speeder	485 00
Fire-fighting tools	1,739 00
Hand tank pumps	175 00
One hygro-thermograph and screen	163 00
Seven sling psychrometers	84 00
Total	$ 4,881 00
Improvements—	
Ten semi-portable tool-caches	$ 119 00
Prince George Garage (proportionate payment)	500 00
Total	$ 619 00
Maintenance—	
Miscellaneous	$ 40 00

PRINCE RUPERT.

Equipment—	
Three Ford cars	$ 1,959 00
Launch "Sycamore"	1,350 00
Fourteen hand tank pumps	180 00
Hose for fire-fighting pumps	283 00
Fire-fighting tools	1,183 00
Four boats and dinghies	329 00
New engine for "Euclataw"	4,388 00
One hygro-thermograph and screen	163 00
Four sling psychrometers	48 00
Total	$ 9,883 00
Improvements—	
Francois Lake Boat-house	$ 550 00
Endako Tool-cache	58 00
Topley Tool-cache	64 00
Walcott Tool-cache	65 00
Kitwanga Tool-cache	56 00
Total	$ 793 00
Maintenance—	
Miscellaneous	$ 30 00

VANCOUVER.

Equipment—	
One hygro-thermograph and screen	$ 145 00
Twenty-one sling psychrometers	252 00
Ten Ford cars	6,036 00
Four bicycles	200 00
One Elto outboard motor	168 00
One Pacific Ross pump	332 00
Twenty hand-pumps	470 00
One Star car	836 00
Seven gear-pumps	456 00
Auxiliary engine for Thurston Bay	980 00
Launch "Check Scaler"	3,100 00
Launch "Chestnut"	700 00
Launch "Scaler"	6,500 00
Six dinghies	525 00
Fire-fighting hose, etc.	2,500 00
Fire-fighting equipment and tools	1,270 00
Total	$24,470 00
Improvements—	
Big–Little Blackwater Trail	$ 139 00
Shawnigan Lake–San Juan River Trail	200 00
Nitinat–Cowichan Lake Trail	135 00
Alice Lake Trail	68 00
Cameron Lake Camp-site	112 00
Camp-sites and camp fireplaces	997 00
Carried forward	$ 1,651 00

VANCOUVER—*Continued.*

Brought forward	$ 1,651 00
Improvements—*Continued.*	
Mooring "Beatrice R."	17 00
Sanitary equipment, Thurston Bay Houses	760 00
Total	$ 2,428 00
Maintenance—	
Myrtle Point Ranger Station and Mooring	$ 181 00
Beaver Creek Ranger Station	98 00
Squamish Ranger Station	81 00
Thurston Bay Ranger Station	35 00
Cowichan Lake Boat-house	7 00
Lang Bay Tool-cache	35 00
Myrtle Point Telephone Line	298 00
Haslam Lake Shelter	7 00
Total	$ 742 00

VERNON.

Equipment—	
Five Ford cars	$ 3,165 00
Twelve hand tank pumps	156 00
Fire-fighting hose, etc.	298 00
Fire-fighting tools	250 00
Three field telephone sets	180 00
One Evinrude pump	376 00
Miscellaneous	45 00
One hygro-thermograph and screen	163 00
Four sling psychrometers	48 00
Total	$ 4,681 00
Improvements—	
B.X. Telephone Line	$ 124 00
Little White Mountain Telephone Line	63 00
Miscellaneous	16 00
Total	$ 203 00
Maintenance—	
Mabel Lake Cabin	$ 42 00
B.X. Trail	21 00
Miscellaneous	53 00
Total	$ 116 00

GRAZING.

General Range Conditions.

The forage-growth on the Crown ranges throughout the grazing country of the Province north of the Railway Belt was excellent during the past season. Rainfall was abundant and unusually evenly distributed, resulting in a very satisfactory hay-crop for the year. All live stock came off the ranges in good condition at the close of the grazing season. The large hay-crop for the year, together with surplus supplies due to the two past winter seasons being very mild, renders it possible for stockmen to feed well this winter with a view to marketing early beef during 1925.

South of the Railway Belt, particularly in the Nicola District, where the grasshoppers gave considerable trouble this season, range conditions were not so good on the untimbered portions of the range. Throughout the balance of the southern ranges, however, conditions in general can be said to have been satisfactory. The timber or midsummer ranges were all good and were not affected by grasshoppers in territory where they were particularly bad, as they infest chiefly the open, warmer areas.

Live-stock Prices.

Live-stock prices have, in general, shown a satisfactory advance during the past year, and even in the case of beef, the price of which on the hoof has been at a low point for some time. There are indications of much better times for the grower who pays attention to uniformity and quality and the marketing of his beef.

Better care must be given to the winter-feeding of beef throughout the range country. Good winter condition in the cattle means maximum growth on the range, where practically all the growth of the range animal is made. Growing condition at the opening of spring makes early beef possible in districts from which such shipment can readily be made. Good condition throughout the summer renders it possible to arrange for shipments at any time. Increased attention must also be given shipping to avoid glutting the market, and if effective efforts are expended along these lines beef prices will be satisfactory.

Authorization.

The grazing of the following numbers of cattle and horses and sheep and goats was authorized in the various established grazing districts:—

District.	Cattle and Horses.	Sheep and Goats.
Cariboo	30,000	4,000
Cranbrook	2,500	10,000
Fort George	500	.....
Kamloops	4,000	1,500
Nelson	2,000	500
Prince Rupert	300	.....
Vancouver	200	.....
Vernon (Nicola and Princeton)	15,000	5,000
Vernon (Okanagan-Similkameen)	5,500	5,000
Totals	60,000	26,000

Permits for the following numbers of live stock have been covered by applications for the season of 1924 to date, November 30th:—

Number of applications	295
Cattle and horses	40,292
Sheep and goats	4,270

The heavy slump of the past few years resulted in quite a cut in beef herds and the decrease in sheep values drove most of the range sheepmen out of business. The restocking has, however, begun and prices are excellent at this time for both wool and mutton, with every indication of maintaining a high figure for a long time. Efforts of ranchers to again engage in the sheep business are handicapped through a scarcity of breeding ewes in Canada and the continuance of the embargo on shipments from the United States owing to the recent foot-and-mouth disease epidemic there.

Applications were also received from 184 Indians, covering 2,136 horses and 1,077 cattle. Efforts are being made to allot the Indians community ranges upon which their live stock can be gathered for summer grazing. This is having a tendency to reduce friction on the range owing to the disinclination of most of the range Indians to adopt progressive measures in cattle and range control.

Approximately 3,000 head of milk cows and work-horses are using Crown range adjacent to the settlements in the range country under free permit.

RANGE IMPROVEMENTS.

Great progress has been made in range-improvement work in co-operation with the permittees of the range during the past season. Preliminary discussion with the stockmen of each range unit is providing for the most-needed improvements on each unit to build up the range and to facilitate the handling of the stock.

The following summary covers both completed and incomplete projects and the figures are indicative of the line being taken in this work by the stockmen:—

Completed Improvements.

Total receipts to date (December 31st, 1924)		$21,571 96
Total expenditures—		
33 drift-fences	$12,163 92	
46 mud-holes	4,432 52	
8 stock-trails	1,108 50	
8 water-developments	199 00	
9 corrals	477 20	
1 holding-ground	559 51	
1 bridge	47 85	
3 experimental reseeding	17 40	
2 salt demonstrations	49 00	
		$19,054 90
Balance, cash on hand		$ 2,517 06

Partially Complete and Improvements under Way.

Drift-fences	14	Corrals	4
Mud-holes	24	Holding-ground	1
Stock-trails	4	Bridge	1
Water-developments	5		

Burning and Reseeding on the Crown Ranges.

While the reseeding experiments are being carried along with the end in view of ascertaining whether or not some cultivated species of forage can be found which will be superior to and which will replace the native vegetation on burns, there is little agitation from stockmen in the matter of burning over timber range. It is being noted that general burning is not productive of good to the range, and that with the judicious placing of salt on even rough timbered range cattle get a most satisfactory and even use of it, with benefit to both the cattle and the overgrazed open ranges. The timbered ranges of British Columbia are superior to any such ranges on the Pacific slope, and, as this is being realized, there is developing a keen desire to conserve and use them properly. The future welfare of the stock-ranches demands it.

WILD HORSES.

During the past eight to ten years there has been no demand for light horses of the range-horse type, with the result that an amazing increase in these animals has taken place. Between the actual wild bands and those permitted to roam at large for years without attention by their owners the range country to a great extent has become infested with these animals. They are generally small, untractable, and usually worthless when captured. They are doing

heavy damage to the range in particular during the early spring when they first come down from the mountain meadows to the open range.

A bad feature is the extraordinary number of stallions among them. These animals do not hesitate to break down pasture-fences and drive away the good mares from the ranches. Very heavy losses have been occasioned the ranchers from this cause alone, for it is most difficult for the horse-owners to recapture these animals after they get away with the wild bands.

The situation is so bad in the Chilcotin District that the ranchers in seven divisions have petitioned the Government Agent and have secured the appointment of seven men to destroy these stallions during this winter. Through co-operative work with the Department it is reasonably certain that a large number of the most vicious animals will be destroyed.

Round-up work carried on by the Department in the Okanagan and Similkameen country has practically cleared those ranges of unbranded and wild horses. A sad phase of the situation is the very noticeable number of old and crippled horses on the range. Undoubtedly they suffer very much, particularly during long winter periods and periods of deep snowfall. It would be merciful to destroy them.

The round-ups have resulted in the capture of many lost horses and the owners have been enabled to recover animals which otherwise it would not pay them to hunt for.

GENERAL.

The future of the range country in the matter of live-stock production is excellent. Great interest has developed among sheepmen from the other Provinces and from the United States regarding the opportunities available in British Columbia to engage in a successful range-sheep business.

Many experienced men have been looking over the available and suitable ranching properties and one firm has already become established in the Province.

Undoubtedly British Columbia can produce the best wool and mutton in Western America, and while there may never be many very large range outfits operating, there will take place a most successful development in the farm and the "one-band" range flock throughout all parts of the Province. The locations of over 1,000 small flocks in British Columbia to-day indicates that every portion of the Province is suited to the production of superior mutton and wool.

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