

PROVINCE OF BRITISH COLUMBIA

---

DEPARTMENT OF LANDS AND FORESTS

HON. E. T. KENNEY, *Minister*

C. D. ORCHARD, *Deputy Minister of Forests*

REPORT  
of  
THE FOREST SERVICE

YEAR ENDED DECEMBER 31ST

1946



VICTORIA, B.C. :

Printed by DON McDIARMID, Printer to the King's Most Excellent Majesty.  
1947.

REPORT  
of  
THE FOREST SERVICE

STATE OF NEW YORK

1946



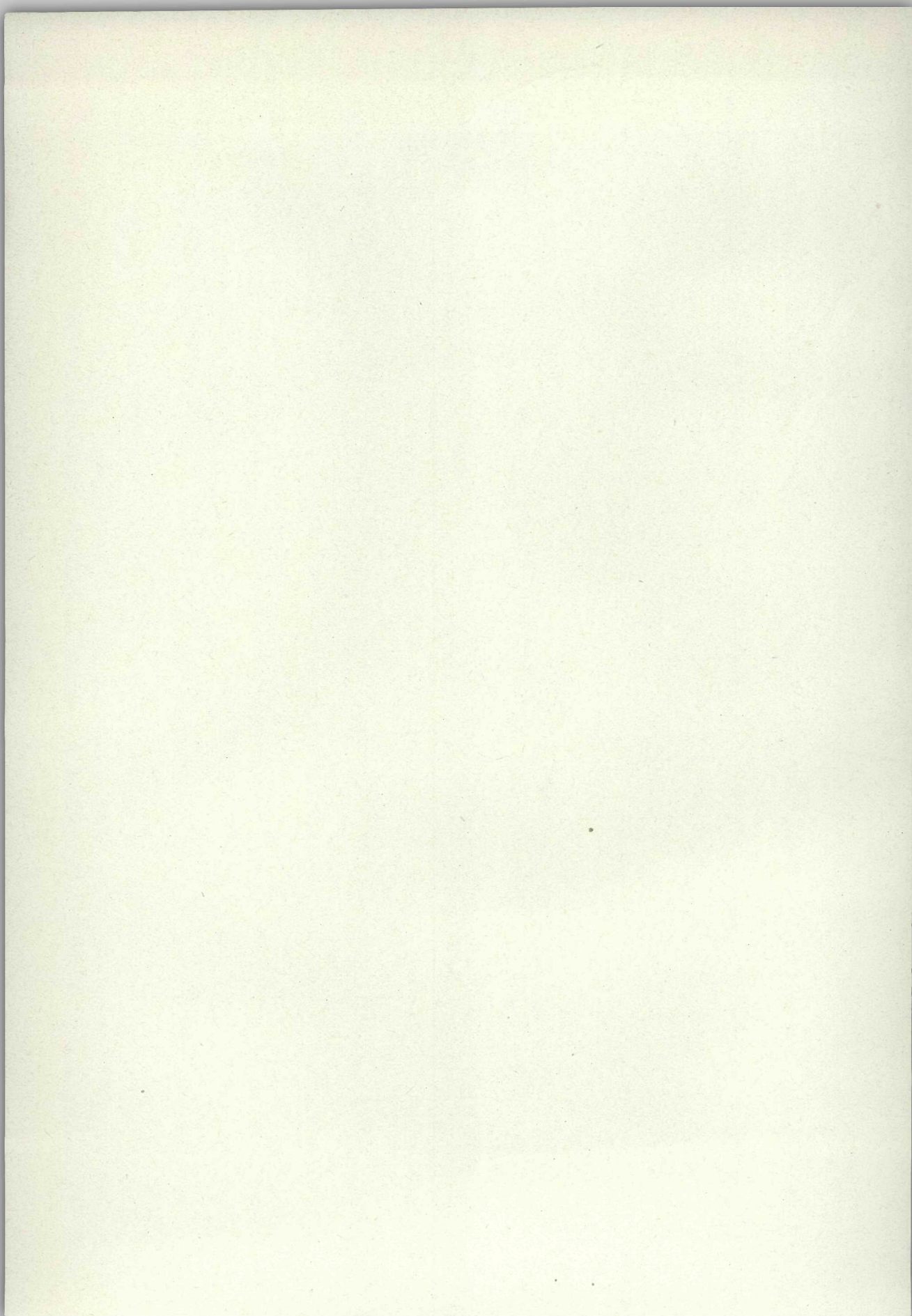
THE STATE OF NEW YORK  
OFFICE OF THE COMPTROLLER





The administration building in Mount Seymour Park in winter-time. With 20 feet of snow, the two lower floors are buried.







VICTORIA, B.C., March 17th, 1947.

*To His Honour COLONEL C. A. BANKS, C.M.G.,  
Lieutenant-Governor of the Province of British Columbia.*

MAY IT PLEASE YOUR HONOUR:

Herewith I beg respectfully to submit the Annual Report of the Forest Service of the Department of Lands and Forests for the calendar year 1946.

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

---

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

SIR,—There is submitted herewith the Annual Report on activities of the Forest Service during the calendar year 1946.

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





# CONTENTS.

ITEM.	PAGE.
1. Introductory.....	7
2. Forest Economics.....	9
Air and Forest Surveys.....	9
Provincial Forests.....	9
Inventory of Forest Resources.....	9
Forest Research.....	10
Mensuration.....	10
Volume Tables.....	10
Growth Studies.....	16
Utilization Studies.....	17
Silvicultural Studies.....	18
Southern Coast Forest.....	18
Northern Coast Forest.....	21
Soil Surveys and Research.....	22
Provincial Parks.....	25
3. Reforestation.....	27
Forest Nurseries.....	27
Seed Collections.....	27
Reconnaissance and Survey-work.....	27
Planting.....	28
4. Forest Management.....	29
5. Forest Protection.....	31
Weather.....	31
Fires.....	32
Occurrences and Causes.....	32
Cost of Fire-fighting.....	32
Damage.....	33
Fire-control Research and Planning.....	33
Planning.....	33
Panoramic Lookout Photographs.....	34
Fire-weather Studies.....	34
Weather-recording.....	34
Investigations.....	34
Fire-suppression Crews.....	36
Aircraft.....	37
Mechanical Equipment.....	37
Automotive.....	37
Fire-pumps and Outboard Motors.....	38
Mechanical Inspection.....	38
Forest Service Marine Station.....	38
Building and Construction.....	39
Radio.....	39
Slash-disposal and Snag-falling.....	40
Prevention.....	42
Co-operation—other Agencies.....	43
Fire Law Enforcement.....	43
6. Forest Ranger School.....	44



ITEM.	PAGE.
7. Public Relations and Education.....	46
8. Grazing.....	48
General Conditions.....	48
Markets and Prices.....	48
Live-stock Losses.....	49
Range Reconnaissance.....	49
Co-operation.....	49
Grazing Permits.....	49
Collections.....	49
Range Improvement.....	50
9. Personnel Directory, December 31st, 1946.....	51
10. Appendix—Tabulated Detailed Statements to Supplement Report of Forest Service.....	55



## REPORT OF THE FOREST SERVICE.

---

Free from the trammels of almost total war for the first time in six years, the world, in 1946, began the long, tedious task of rebuilding the ravages of conflict and speeding up the production of materials and supplies so urgently required for peacetime happiness and welfare. Like almost every other organization extant, the Forest Service was faced with greatly increased work and responsibilities, new demands, and new functions. Although the slow accretion of staff and the inadequate flow of equipment failed to keep pace with the additional work, nevertheless creditable progress was made.

Two items of reorganization within the Service deserve special mention at this point. After many years of consideration and planning, the establishment of a Forest Ranger School became a *fait accompli*, with a full-time teaching staff of two and supplementary instruction provided by officers of the Service engaged in specialized pursuits, by forest entomologists and pathologists in the service of the Dominion Department of Agriculture, by a meteorologist of the Dominion Meteorological Service, and by a member of the St. John Ambulance Association. Sincere thanks are extended to these individuals and the organizations concerned for their expert assistance. The first term opened at the Ranger School, located at Green Timbers Forestry Station, in January, with twenty students in attendance.

The second major change in Departmental set-up was the establishment of the Reforestation Division, formerly a section of the Economics Division, as a distinct and separate unit, under the direction of the same technical officer who had previously carried on this work.

Although not ranking as a major change in the organization, there was a minor rearrangement made whereby the Vancouver Forest District was relieved of the supervision of the (then) Fraser River Repair-station and this responsibility placed with the Victoria office of the Service, and, coincident with this change, the name of the plant was changed to the Forest Service Marine Station.

The report of the Royal Commission on Forestry was submitted to the Government by the sole Commissioner, the Honourable Chief Justice Gordon McG. Sloan, early in the year and, as was anticipated, contained many vital and far-reaching recommendations. Although only a brief time elapsed between submission of the report and the 1946 session of the Legislature, several amendments to the "Forest Act" marked the first steps in implementation of a number of the proposals advanced. During the subsequent months, senior officers of the Service have been engaged in draughting other legislation further implementing the Commissioner's recommendations.

Legislation enacted at the 1946 session provided for the following:—

- (1.) An increase of \$350,000 in the Forest Protection Fund vote for the year.
- (2.) The establishment of a Silvicultural Fund for ensuring perpetuation of the forest yield.
- (3.) Provision for the grading of hemlock logs.
- (4.) Provision for rebating a portion of the royalty on fire-killed timber and timber which, by virtue of its small size, has only salvable value.
- (5.) An amendment to the section of the "Forest Act" governing the felling of snags and burning of slash in the Vancouver Forest District to provide that such practices need only be carried out upon specific instructions of the Forest Service.



With the return of technically trained personnel from the armed services it has been possible to re-establish a number of silvicultural and other studies that had, perforce, been suspended during the previous six years, as well as to initiate some new investigations. The increased staff also permitted an acceleration of the surveying and mapping programme.

The year created a number of new highs in the Management (utilization) functions of the Service. Despite the time-losses resulting from industrial disputes, because of unusually favourable climatic conditions production in all lines was maintained at a high level and the aggregate value of production exceeded any previous figures.

The average stumpage price bid on timber-sales during the year was \$2.39 per thousand as compared with \$2.19 per thousand in 1945 and \$1.80 per thousand in the ten-year period 1937-46. There was a total of 1,228 mills operating, nearly double the ten-year average of 661, and exceeding the 1945 figure of 931 by 297.

The total timber-scale for the Province, expressed in board-feet, was 3,193,665,132 as compared with 3,081,235,491 in the previous year. Douglas fir again leads the species cut, with 1,235,382,842 feet; hemlock ranks second with 635,216,631 feet; and cedar third with 614,567,545. This represents a gain for fir and cedar over 1945, and a slight recession for hemlock.

A total of 2,627 timber-sales was made during the year, exceeding by over 600 sales the number made in any previous year.

Hazard conditions throughout the Province were generally better than average, and this condition was reflected in the reduced number of, and damage caused by, fires compared to the previous year. July and August were again the months of greater hazard. Of the total of 1,707 fires, 81 per cent. was confined to 10 acres or less and 51 per cent. covered less than one-quarter acre. A total of 303,395 acres was burned over, compared to the ten-year average (1937-46) of 330,884 acres. Of this year's total, 12,941 acres were accessible, merchantable timber, resulting in an estimated loss of 63,992,000 F.B.M., with stumpage valued at \$57,250. The total estimate of damage caused by fires (\$357,984) compares most favourably with the ten-year average of \$794,929, and only the years 1937 and 1943 show a better individual figure.

Industrial operations caused 21.48 per cent. of the fires, smokers 19.54 per cent., brush-burning 16.90 per cent., and lightning and campers 12.24 and 12.15 per cent. respectively.

It was possible during the year to recommence fire-control planning after a lapse of four years. Eighty possible lookout-sites were examined, and essential data recorded. Fire-weather recording was expanded, and further studies in fire-hazard measurement carried out. A contract was negotiated for four aircraft for fire-detection and suppression work. Snag-felling and slash-disposal activities were satisfactory, although the latter were somewhat hampered by unsuitable burning weather.

The vital and welcome trend towards sustained-yield management being evidenced by the forest industries has unhappily, from the Service standpoint, resulted in the loss to industry ranks of a number of able and experienced, technically trained forest officers. The Service can take satisfaction, however, from the fact that these competent technicians will still be working for the continuity and welfare of our greatest renewable resource.



## FOREST ECONOMICS.

As pointed out in the 1945 report, the urgent need of the Economics Division is for technically trained men. During 1946 two more graduate foresters left to seek other employment. These men cannot be replaced immediately, and it will be from three to five years before much alleviation of the present situation can be expected.

## AIR AND FOREST SURVEYS.

Under a new administrative arrangement all air survey operations in the Department of Lands and Forests are to be handled by the Air Survey Division of the Surveyor-General's Branch. The aerial photographic equipment of the Forest Service has been turned over to this new organization, which has accepted the responsibility for carrying out such operations as are requested. During the summer of 1946 a total of about 16,700 square miles was photographed for future forest surveys and the printed photos submitted to the Forest Service. These photos are in the process of being plotted and preliminary forest-type maps made up for the use of the field survey parties.

Two field survey parties were in the field for the full season, and it is worthy of note that there was no turnover in personnel among the student assistants. One party, working from the launch "B.C. Forester," continued on the West Coast of Vancouver Island, working north from Tofino, where the 1945 survey stopped, to the height of land between Sydney and Muchalat Inlets. An area of 539,010 acres was examined, and this, added to 674,000 acres surveyed in the region during 1945, gives a total of 1,213,010 acres for the Clayoquot survey. Forest-cover maps for the region are being draughted and estimates of the forest resources prepared but, due to insufficient experienced personnel, progress is slow.

The second party was working on a revision of the inventory of the E. & N. Railway Belt and covered an area of 479,080 acres. It is planned to continue this revision in succeeding years until the entire region has been re-examined and data gathered for an inventory to replace that made for 1936. The revised cover maps and timber estimates are now in the process of preparation.

## PROVINCIAL FORESTS.

There were no new Provincial forests created during the past year, and only very minor eliminations made for sale for industrial purposes. The total number of forests is unchanged at fifty-three, representing an area of 31,134 square miles.

## INVENTORY OF FOREST RESOURCES.

In the report for 1945 it was noted that, with the easing of the labour situation, it had been possible to secure additional draughting assistance, with the result that the forest-atlas maps at the district offices at Vancouver, Kamloops, and Nelson had been placed on a current revision basis. The Prince Rupert District has now been put on a similar basis, thereby providing cover maps which indicate, at all times, the latest conditions relative to fire and logging. A total of 1,234 maps was revised in the course of the year, of which 60 were new replacements.

Instruction in area mapping was given to the current class at the Ranger School. In addition, instruction was given in the field to the Rangers, Assistant Rangers, and Patrolmen in fifteen ranger districts scattered throughout the Province.

An extensive reconnaissance of the Peace River Block was made by a combination of air and land travel for the purpose of revising existing cover-map information. A total of 6,500 square miles was examined.



The Provincial Fire Atlas has been maintained, showing the location of all forest fires and slash burns.

### FOREST RESEARCH.

#### MENSURATION.

The programme of re-examination of permanent growth-study plots was maintained, with the remeasurement of 30 plots. There is now a total of 559 yield-plots established throughout the Province.

The series of plots in the Queen Charlotte Islands was increased by the addition of 42 new plots established during the past year, to give a total of 93 plots for this region.

A study was made of the height-growth of dominant hemlock on the West Coast of Vancouver Island, and it was found that the species in that region maintains a definite leader throughout its life. Height-growth continues to increase to a remarkably old age, as the following table indicates:—

Age.	Total Height in Feet.	Age.	Total Height in Feet.
50.....	68	300.....	187
100.....	126	400.....	193
200.....	174	450.....	195

Data such as the above can be used in the preparation of site-class yield tables and for correlating height at maturity with the height of dominant trees at 100 years.

#### *Volume Tables.*

Volume tables have been prepared for immature Sitka spruce showing both board-foot and cubic-foot values. These tables are presented in this report on pages 11 and 12.

During the past year considerable effort has been expended in the preparation of preliminary site-class tables for the poor sites common to much of the Coastal region. In the past many of these sites have been classified as scrub for inventory purposes. This is a vague classification and of no assistance in yield calculations. It is anticipated that by using the new preliminary tables, use of the term "scrub" can be largely eliminated. Copies of the new tables have been compiled together with those formerly in use and the summary for mature Douglas fir, hemlock, and cedar on pages 13, 14, and 15. These tables are made up on a basis of maximum height at maturity.



VOLUME TABLE—IMMATURE SITKA SPRUCE (*Picea sitchensis*).

(Volume in board-feet.)

D.B.H. (Inches).	TOTAL HEIGHT IN FEET.												No. of Trees.	D.B.H. (Inches).
	50.	60.	70.	80.	90.	100.	110.	120.	130.	140.	150.	160.		
7	5	7	9	11	13	16							4	7
8	10	13	18	24	31	38	47						4	8
9	15	21	29	39	49	60	72						4	9
10	20	29	40	52	67	83	101	121	146				5	10
11	25	36	50	66	84	105	128	155	186				6	11
12	30	44	60	80	102	128	157	190	227	270			5	12
13		51	70	94	120	151	185	225	270	320			5	13
14		58	80	108	138	174	214	260	310	370	430	500	2	14
15		65	91	122	157	197	243	300	360	420	490	570	9	15
16		72	101	136	175	221	275	335	400	470	550	640	2	16
17		80	112	150	195	245	305	375	450	530	620	710	6	17
18			123	165	214	270	335	410	490	580	680	780	3	18
19			133	180	235	295	370	450	540	630	740	850	2	19
20				195	255	325	400	485	580	690	800	920	1	20
21				210	275	350	430	520	630	740	870	1000	1	21
22				225	295	375	460	560	680	800	930	1070		22
23				240	320	400	495	600	730	860	1000	1150	1	23
24				255	335	425	525	640	770	910	1060	1220	2	24
25				270	355	450	560	680	810	960	1130	1300	2	25
26				290	375	475	590	720	860	1020	1190	1370	1	26
27				305	395	500	620	750	900	1070	1250	1450		27
28				320	415	530	650	790	950	1130	1320	1520		28
29				335	440	560	690	830	1000	1190	1380	1600		29
30					460	580	720	870	1050	1240	1450	1680		30
31					480	610	750	910	1100	1300	1520	1750		31
32					500	630	780	950	1150	1360	1590	1830	1	32
33					520	660	820	990	1200	1420	1660	1910		33
34					540	690	850	1030	1240	1470	1720	1990		34
35					560	710	880	1080	1300	1530	1780	2060		35
No. Trees		1	4	8	16	14	13	7	2		1		66	

Block indicates extent of basic data. Data collected in Queen Charlotte Islands in stands from 70 to 125 years of age. Stump height, 2 feet. Top D.I.B., 60 inches. Trees scaled in 32-foot log lengths with 0.60-foot trimming allowance and additional top section to 6-inch top diameter (inside bark). Table prepared by alignment-chart method, 1946. Aggregate deviation from basic data, 0.33 per cent. low; standard error of single volume estimate, 16.36 per cent.



VOLUME TABLE—IMMATURE SITKA SPRUCE (*Picea sitchensis*).  
(Volume in cubic feet.)

D.B.H., O.B. (Inches).	TOTAL HEIGHT IN FEET.																Basis Trees.	D.B.H., O.B. (Inches).
	10.	20.	30.	40.	50.	60.	70.	80.	90.	100.	110.	120.	130.	140.	150.	160.		
1	0.028	0.057																1
2	0.107	0.224	0.334															2
3	0.247	0.478	0.709	0.930	1.15													3
4	0.420	0.813	1.21	1.60	1.98	2.38	2.78	3.18	3.58									4
5		1.24	1.85	2.45	3.05	3.65	4.25	4.85	5.45								3	5
6		1.76	2.62	3.46	4.30	5.15	6.00	6.85	7.70								4	6
7		2.35	3.50	4.65	5.79	6.91	8.03	9.15	10.3	11.5							2	7
8					7.48	8.93	10.4	11.8	13.3	14.8							4	8
9					9.35	11.2	13.0	14.8	16.6	18.5	20.4	22.1					4	9
10					11.4	13.7	15.9	18.1	20.3	22.5	24.8	26.9					6	10
11					13.7	16.4	19.1	21.8	24.4	27.1	29.8	32.4					6	11
12						19.3	22.5	25.7	28.9	32.0	35.2	38.3					6	12
13						22.5	26.2	29.9	33.6	37.3	41.0	44.6					3	13
14						26.0	30.2	34.5	38.7	42.9	47.1	51.2					3	14
15							34.4	39.3	44.1	48.9	53.6	58.2	62.9	67.7			5	15
16							38.9	44.5	50.0	55.5	60.9	66.2	71.4	76.7			5	16
17							43.6	49.9	56.1	62.3	68.4	74.4	80.3	86.1			5	17
18							48.6	55.7	62.6	69.4	76.1	82.5	89.0	95.6			2	18
19								61.8	69.4	76.8	84.1	91.4	98.7	106			3	19
20								68.1	76.4	84.7	92.8	101	109	117			2	20
21								74.6	83.7	92.9	102	111	120	129	138	147	2	21
22								81.4	91.5	102	112	122	132	142	152	162		22
23								88.5	99.8	111	122	134	144	155	165	175	1	23
24								96.0	108	120	132	144	156	168	179	190		24
25										130	144	157	169	182	195	207	3	25
26										141	155	169	182	195	209	223	2	26
27										152	167	182	196	210	225	240		27
28										163	179	194	209	225	241	256		28
29										174	191	207	224	241	257	274		29
30												222	240	258	275	293		30
31												236	255	274	293	312		31
32												252	273	294	314	335	1	32
33												266	288	310	332	354		33
34												282	305	328	351	374		34
Basis						3	7	10	16	14	12	7	2		1		72	

D.B.H. total height volume table—basis, 72 trees; age 70–125 years. Block indicates extent of basic data. Table gives approximate values for trees larger than 28 inches D.B.H. Field measurements plotted in basal area forms and volumes determined by planimeter method. No allowance for defect. Table prepared by converting diameter, height, and volume to logarithms and solving by least squares. Formula derived  $V=0.003(D.I.B.)^{1.91}H^{0.99}$  where  $V$ =total volume in cubic feet,  $D$ =diameter inside bark at breast height, and  $H$ =total height of tree. A monograph was prepared from above formula and the D.I.B. axis regraduated to give D.O.B. using the formula  $D.O.B.=0.16+1.02 D.I.B.$  Table values read from regraduated monograph. Standard error of the estimate of individual trees  $\pm 8.9$  per cent. Aggregate difference, table 0.9 per cent. low.



## PRELIMINARY SITE-CLASS VOLUME TABLE—MATURE DOUGLAS FIR.

Utilized top D.I.B.= $2.0+0.42$  D.B.H., O.B.  
Stump, 3.3 feet.

Total height= $4.5+bD-cD^2$ .  
B.C. rule: Logs as cut.

$b=22.8+300$  C.

D.B.H.	$b=5.70$ , $c=0.0950$ , Site Index 60.		$b=6.60$ , $c=0.0980$ , Site Index 80.		$b=7.50$ , $c=0.101$ , Site Index 100.		$b=8.40$ , $c=0.1040$ , Site Index 120.		$b=9.30$ , $c=0.1070$ , Site Index 140.		$b=10.20$ , $c=0.1100$ , Site Index 160.		Top D.I.B. (Inches).
	Total Ht.	Vol.	Total Ht.	Vol.	Total Ht.	Vol.	Total Ht.	Vol.	Total Ht.	Vol.	Total Ht.	Vol.	
8	44	20	51	25	58	30	65	35	72	40	79	45	5.6
10	52	40	61	50	69	60	78	75	87	85	95	95	6.4
12	59	70	70	90	80	110	90	130	101	150	111	170	7.2
14	66	110	78	140	90	118	101	210	114	250	126	280	8.1
16	71	150	85	200	99	260	112	310	126	370	140	420	8.9
18	76	190	92	260	107	350	122	440	137	530	153	620	9.7
20	80	230	97	330	114	450	131	570	148	700	165	830	10.6
22	84	280	102	420	121	570	139	730	157	880	176	1040	11.4
24	87	320	106	500	126	700	146	900	166	1100	186	1280	12.2
26	88	360	110	590	131	830	152	1070	174	1310	195	1540	13.1
28	89	390	112	680	135	980	158	1280	181	1560	204	1850	14.0
30	90	430	114	780	139	1130	163	1500	187	1830	211	2200	14.8
32	90	520	115	860	141	1290	167	1720	193	2150	218	2560	15.6
34	90	650	115	950	142	1440	170	1950	197	2420	224	2920	16.5
36			116	1050	143	1590	172	2160	200	2700	229	3280	17.3
38			116	1150	143	1760	173	2400	203	3060	233	3700	18.1
40			116	1250	144	1950	174	2660	205	3460	236	4120	19.0
42			116	1400	144	2130	174	2900	206	3760	239	4490	19.8
44					144	2350	174	3200	206	4130	240	5100	20.6
46					144	2550	174	3490	206	4510	241	5580	21.5
48					144	2800	174	3820	206	4960	241	6030	22.3
50					144	3000	174	4190	206	5380	241	6640	23.1
52					144	3200	174	4460	206	5740	241	7030	24.0
54					144	3450	174	4760	206	6150	241	7740	24.8
56					144	3700	174	5080	206	6600	241	8270	25.6
58					144	3950	174	5380	206	7000	241	8860	26.5
60					144	4200	174	5800	206	7480	241	9460	27.3
62							174	6200	206	8000	241	10000	28.2
64							174	6600	206	8400	241	10600	29.0
66							174	7000	206	9000	241	11200	29.9
68							174	7400	206	9600	241	11800	30.7
70							174	7880	206	10100	241	12570	31.3
72									206	10500	241	13200	32.4
74									206	11000	241	13900	33.2
76									206	11600	241	14500	34.0
78									206	12200	241	15300	34.8
80									206	12840	241	16000	35.6

NOTE.—Site index based on height of dominants and codominants at 100 years.



## PRELIMINARY SITE-CLASS VOLUME TABLE—MATURE HEMLOCK.

$$\text{Total height} = 4.5 + bD - cD^2.$$

$$b = 11.54 - 10.13c.$$

D.B.H.	$b=9.06.$ $c=.245.$ Site Index 60.		$b=9.43.$ $c=.208.$ Site Index 80.		$b=9.75.$ $c=.177.$ Site Index 100.		$b=10.01.$ $c=.153.$ Site Index 120.		$b=10.19.$ $c=.135.$ Site Index 140.		$b=10.33.$ $c=.121.$ Site Index 160.		Top D.I.B. (Inches).
	Total Ht.	Vol.	Total Ht.	Vol.	Total Ht.	Vol.	Total Ht.	Vol.	Total Ht.	Vol.	Total Ht.	Vol.	
8	61	23	67	26	71	28	75	30	77	31	79	32	6.0
10	71	49	78	56	84	62	89	67	93	71	96	74	6.5
12	78	88	88	105	96	120	103	130	107	140	111	145	7.0
14	84	140	96	175	106	200	115	220	121	235	126	245	7.4
16	87	200	102	255	115	300	126	335	133	360	139	380	7.8
18	88	260	107	345	123	415	135	470	144	510	151	540	8.2
20	88	320	110	435	129	545	144	630	154	690	163	730	8.6
22	88	385	111	540	133	680	151	810	163	890	173	950	9.0
24	88	445	111	630	136	820	157	1000	171	1110	183	1200	9.4
26	88	510	111	720	138	970	161	1190	178	1340	191	1470	9.8
28	88	580	111	820	139	1120	165	1400	184	1600	199	1770	10.2
30	88	660	111	930	139	1270	167	1610	189	1880	206	2090	10.6
32	88	740	111	1050	139	1430	168	1830	192	2160	211	2430	11.0
34	88	810	111	1160	139	1590	168	2040	195	2440	216	2770	11.4
36	88	890	111	1280	139	1760	168	2260	196	2730	220	3130	11.8
38	88	980	111	1390	139	1930	168	2480	197	3020	222	3480	12.2
40			111	1510	139	2100	168	2700	197	3300	224	3830	12.6
42			111	1620	139	2260	168	2910	197	3570	225	4170	13.0
44			111	1740	139	2420	168	3120	197	3830	225	4500	13.4
46			111	1840	139	2570	168	3320	197	4090	225	4820	13.8
48			111	1930	139	2710	168	3530	197	4350	225	5130	14.2
50			111	2010	139	2850	168	3730	197	4610	225	5450	14.6

NOTE.—Site index based on height of dominants and codominants at 100 years.

Volumes calculated from standard western hemlock volume table based on D.B.H. and total height (Table 9, Volume, Yield, and Stand Tables, B.C. Forest Service, 1936). Minimum stump height, 2.0 feet for trees 24 inches; stump height for trees above 24 inches, same as D.B.H. Top D.I.B.=4.6 inches+0.2 D.B.H., O.B. Trees scaled in 32.6-foot logs.



## PRELIMINARY SITE-CLASS VOLUME TABLE—MATURE CEDAR.

Top D.I.B.=0.419 D.B.H., O.B.+2.18.

Total height=4.5+bD-cD<sup>2</sup>.

b=-3.84+160c.

D.B.H.	b=2.73. c=.0411. Site Class VI.		b=3.80. c=.0478. Site Class V.		b=4.74. c=.0535. Site Class IV.		b=5.66. c=.0591. Site Class III.		b=6.55. c=.0649. Site Class II.		b=7.41. c=.0704. Site Class I.		Top D.I.B. (Inches).
	Total Ht.	Vol.	Total Ht.	Vol.	Total Ht.	Vol.	Total Ht.	Vol.	Total Ht.	Vol.	Total Ht.	Vol.	
8	24	3	32	5	39	8	46	10	53	13	59	17	5.5
10	28	7	38	12	47	17	55	23	64	30	72	37	6.4
12	31	11	43	20	54	30	64	42	74	54	83	67	7.2
14	35	18	48	29	60	44	72	69	84	92	94	115	8.0
16	38	28	53	50	67	78	80	110	93	140	105	175	8.9
18	40	38	57	72	73	115	87	155	101	205	115	290	9.7
20	43	53	61	100	78	155	94	220	109	285	124	360	10.6
22	45	69	65	135	83	210	100	290	117	390	133	490	11.4
24	47	88	68	175	88	275	106	380	124	510	142	650	12.2
26	48	110	71	215	92	345	112	495	131	650	150	830	13.1
28	49	130	73	265	95	425	117	620	137	810	157	1050	14.0
30	50	150	75	315	98	510	121	740	143	1000	164	1280	14.8
32	50	170	77	370	101	610	125	890	148	1200	170	1550	15.6
34	50	190	78	430	104	720	129	1060	152	1420	175	1830	16.5
36	50	215	79	490	106	830	132	1230	156	1660	180	2150	17.3
38	50	240	80	560	107	940	134	1400	160	1920	185	2500	18.1
40	50	265	80	620	108	1050	136	1580	163	2190	189	2870	19.0
42	50	290	80	680	109	1170	138	1780	165	2470	192	3250	19.8
44	50	315	80	740	109	1290	139	1980	167	2750	195	3650	20.6
46	50	345	80	800	110	1410	140	2180	168	3030	197	4030	21.5
48	50	375	80	870	110	1530	140	2360	169	3330	198	4400	22.3
50	50	405	80	950	110	1660	140	2550	170	3630	199	4830	23.1
52			80	1020	110	1790	140	2750	170	3910	200	5280	24.0
54			80	1090	110	1930	140	2960	170	4210	200	5700	24.8
56			80	1170	110	2060	140	3170	170	4520	200	6100	25.6
58			80	1250	110	2200	140	3380	170	4820	200	6500	26.5
60			80	1330	110	2350	140	3610	170	5130	200	6900	27.3
62					110	2500	140	3850	170	5450	200	7350	28.2
64					110	2660	140	4100	170	5800	200	7850	29.0
66					110	2830	140	4350	170	6150	200	8350	29.9
68					110	2990	140	4600	170	6550	200	8850	30.7
70					110	3150	140	4850	170	6900	200	9300	31.3
72							140	5100	170	7250	200	9800	32.3
74							140	5400	170	7650	200	10300	33.2
76							140	5650	170	8050	200	10850	34.0
78							140	5950	170	8450	200	11400	34.9
80							140	6250	170	8900	200	11950	35.7



*Growth Studies.*

For the purpose of determining the total ages of older trees when ring-counts are made at known heights above the ground, an analysis was made of a number of dominant hemlock and Sitka spruce seedlings and saplings growing under average conditions on the Queen Charlotte Islands. The resulting data are presented in the following table:—

## HEIGHT-GROWTH OF SPRUCE AND HEMLOCK.

## QUEEN CHARLOTTE ISLANDS.

Total Height (Feet).	TOTAL AGE.		Total Height (Feet).	TOTAL AGE.	
	Spruce.	Hemlock.		Spruce.	Hemlock.
1.....	2.5	3.3	10.....	9.8	10.3
2.....	3.8	3.8	12.....	10.8	11.5
3.....	4.9	5.0	14.....	11.8	12.6
4.....	6.0	6.0	16.....	12.7	13.7
5.....	6.8	6.8	18.....	13.5	14.7
6.....	7.5	7.7	20.....	14.4	15.9
7.....	8.2	8.5	25.....	16.2	18.5
8.....	8.8	9.0	30.....	23.2	21.0
9.....	9.3	9.6			

The percentage volume in total cubic feet of hemlock and Douglas fir was determined in fifty-six permanent plots, with an interval averaging fourteen years between first and last examination. Plots with 80 per cent. or greater volume of either hemlock or Douglas fir did not show a significant change in composition. In the mixed types with less than 80 per cent. of the volume being in any one species, the stand averaged 52 per cent. hemlock, 36 per cent. fir, and 12 per cent. other species. Douglas fir in the latter types increased 4 per cent. in composition per decade from thirty to fifty years, with a corresponding decrease in hemlock. The relative proportion of Douglas fir on plots over fifty years of age showed no significant change. These findings are in contradiction to the theory frequently put forward that the proportion of Douglas fir in immature mixtures increases significantly with age. Any increase in the status of Douglas fir is found to occur in the first fifty years of the life of the stand.

As a result of the periodic remeasurement of the permanent yield-plots, some of which have now been under observation for nearly twenty years, it is possible to compile some tables of average yield. These data constitute a check against preliminary yield tables based on temporary plots. A summary of the latest compilations is presented in the following table:—

## AVERAGE YIELDS, COAST PERMANENT PLOTS.

Total Age.	DOUGLAS FIR.			HEMLOCK.			HEMLOCK-FIR.		
	Total Cu. Ft. (100's).	Merch. B.F.		Total Cu. Ft. (100's).	Merch. B.F.		Total Cu. Ft. (100's).	Merch. B.F.	
		Int. $\frac{1}{8}$ (1,000's).	B.C. (1,000's).		Int. $\frac{1}{8}$ (1,000's).	B.C. (1,000's).		Int. $\frac{1}{8}$ (1,000's).	B.C. (1,000's).
20.....	7.5	.....	.....	10	.....	.....	9	.....	.....
30.....	21.0	5	3.5	34	7	4.5	30	6	4
40.....	37.0	15	12.5	60	23	14.0	34	20	13
50.....	52.0	27	22.0	84	41	24.0	75	34	24
60.....	67.0	40	31.0	104	58	35.0	92	50	34
70.....	82.0	53	40.0	122	75	46.0	108	66	45
80.....	97.0	65	48.0	132	90	56.0	122	79	55
90.....	112.0	78	54.0	150	102	65.0	136	92	65

The volume is based on fifty-five plots.



*Utilization Studies.*

An analysis was made of the top diameters to which trees are cut in Coast logging operations to determine if the standards used in Forest Service volume tables for mature stands needed adjustment.

## RELATIONSHIP OF UTILIZED TOP D.I.B. TO D.B.H.

HEMLOCK, 1945.

Locality.	West Coast, Vancouver Island.	Queen Charlotte Islands.	
Topography.....	Slope	Slope	Flat
Number of trees.....	283	323	181
D.B.H. range.....	13"-56"	15"-60"	15"-45"
D.B.H. average.....	28"	28"	26"
Top range.....	8"-32"	8"-33"	10"-24"
Top average.....	16.5"	16.3"	13.5"
Standard error, top diameter.....	$\pm 2.80"$	$\pm 3.60"$	$\pm 2.65"$
Per cent. variance in tops associated with diameters.....	76	44	34

*Formula.*Volume tables: Top D.I.B.= $2.1" + .419$  D.B.H., O.B.West Coast slope: Top D.I.B.= $5.0" + .412$  D.B.H., O.B.Queen Charlotte slope: Top D.I.B.= $6.2" + .325$  D.B.H., O.B.Queen Charlotte flat: Top D.I.B.= $7.4" + .235$  D.B.H., O.B.

## HEMLOCK.

D.B.H.	AVERAGE TOP D.I.B.			
	West Coast, Vancouver Island, Slope.	Queen Charlotte Islands.		Tops used in Volume Tables.
		Slope.	Flat.	
12.....	10.0	10.0	10.0	7.0
20.....	13.3	12.7	12.1	10.4
30.....	17.4	15.9	14.4	14.6
40.....	21.5	19.2	16.8	18.8
50.....	25.6	22.4	19.1	23.0
60.....	29.8	25.7	21.5	27.2

Only four trees in this study were cut to an 8-inch top. The tendency was to utilize trees which would cut a 40-foot log to a 10-inch top. Larger trees were cut to the break in the top. The portion above the break in the larger trees is usually very limby, rough, and broken up into short sections, and of doubtful practical merchantability. The fact that trees are cut to the break in the top accounts for the similarity in the top utilization now and twenty years ago. The breakage varies with slope, as shown in the comparison of trees cut on the West Coast in 1945, and the lower Mainland in 1924. The West Coast is steeper than the areas being logged on the Lower Mainland in 1924, which accounts for the tops being about 3 inches larger.

The standard error of top diameter gives an indication of the spread in the size of tops. For example, the spread from the average shown for each D.B.H. class will not be more than  $\pm 1$  standard error 68 per cent. of the time,  $\pm 2$  standard error 95 per cent. of the time, and  $\pm 3$  standard error 99.7 per cent. of the time. Example, on the West Coast the average 30-inch tree is cut to a 17.4-inch top. In 5 per cent. of the trees the range in tops will be 2 standard error= $2 \times 2.8 = 5.6$  inches above or below the average top, or between 11.8 inches and 22.0 inches.



The study also shows that on the West Coast 76 per cent. of the variance in tops is associated with diameter and 24 per cent. with other factors. However, on the Queen Charlotte Islands less than half of the variance was associated with change in diameter. This indicates the need for further studies to determine why this condition exists.

Although the volume of logs has been decreasing at the rate of 100 board-feet per decade, this decrease is mainly due to the decrease in quality of the stands and the utilization of smaller trees rather than closer cutting in the top of old-growth stands. Even in salvage operations the bulk of the material will come from the smaller trees in the stands rather than the rough old-growth tops.

This study shows that the top diameters inside bark, used in our standard tables, are satisfactory for cruising old-growth timber on the Coast. It also shows that tables based on a uniform top would be less satisfactory for our conditions.

#### SILVICULTURAL STUDIES.

##### *Southern Coast Forest.*

Silvicultural research in the Douglas fir types was directed towards making full use of established projects by re-examination of experimental plots designed to give data which will add to knowledge of seed production, natural regeneration, direct seeding, pruning, and thinning.

The Douglas fir cone crop was a failure in 1946, as was expected after an excellent crop the previous year. On the Queen Charlotte Islands the crop of Sitka spruce was also a failure. No crop was produced on any coniferous species in the Lower Fraser Valley, where there has not been a good Douglas fir crop since 1941. Observations of seed production in the Coast Douglas fir types, based on counts of cones on plots established to study the volume of seed produced by stands of various ages, and plots which follow seed production from year to year on individual trees in different age and site classes, are beginning to yield objective data on size and periodicity of cone crops. The following table gives this information for recent crops:—

SEED PRODUCTION FOR DOUGLAS FIR ON VANCOUVER ISLAND.

Stand Type.	YEAR OF CROP.								
	1938.	1939.	1940.	1941.	1942.	1943.	1944.	1945.	1946.
Scattered mature, residual after logging on medium sites.....	Percentage of Trees bearing Crops.								
	95	76	26	98	10	97	5	100	0
Young growth and mature in stands on good sites.	Percentage of Trees bearing Good Crops.								
	45	31	0	43	0	29	2	52	0

There were three productive crops throughout the type during the nine-year period, an excellent crop in 1945, with two good ones close together in 1938 and 1941.

The conditions of site on cut-over areas change with the passage of time, and these changes are being studied in relation to the rate of regeneration on typical Douglas fir sites. Experimental plots have been under observation on two sites of fair quality. A comparison of the regeneration following good to excellent seed crops in the first,



third, and eighth years following logging gives interesting results. The data are as follows:—

Years after Logging.	PROPORTION OF TOTAL.		
	Cone Crops.	Germination.	Survival.
One.....	25	24	24
Three.....	35	37	32
Eight.....	40	39	44

These results indicate that the Douglas fir sites being studied are as receptive to reproduction eight years after logging as at the beginning of regeneration. In fact, the last crop of seed produced better results than for the previous years because of slow development of vegetation on these areas.

A fair survival of Douglas fir was obtained on direct-seeded spots spaced 5 by 5 feet. At ten years, when crowns were beginning to meet, it was reported (Forest Branch Report, 1943) that the dominant tree on spots crowded with several trees was of good form and taller than those on spots where only one tree survived. This apparently beneficial condition had changed at 15 years of age, when the bases of crowded trees were beginning to come together. In open parts of the stand these trees developed enough bend at the base to affect form. To check on the effect of this condition, some of the multiple-tree spots have been reduced to one tree. This will give a comparison with the growth on crowded spots, released spots, and spots bearing a single tree throughout. During the first three years of this study, mortality was 39 per cent., but there was no more loss until *Armillaria* disease and suppression entered the stand seven years later. From 10 to 15 years, the loss from these causes was 9 per cent. When the trees on seed spots were 10 years old, natural regeneration surrounding the plot was not conspicuous because the stocking is low, but at 15 years the natural reproduction has the appearance of being much denser than formerly. Although three to four years younger, it now almost masks the seeded plot.

In silvicultural improvement of stands, thinning and pruning operations contribute to the effectiveness of each other. Thinnings are designed to increase the growth of wood on fewer trees, but Douglas fir will not naturally produce any appreciable quantity of clear wood on these favoured trees within limited rotations. To warrant the thinning, it becomes necessary to improve the quality of production by pruning. In 1942 the dominant trees in a plantation on a very good site at Green Timbers Forestry Station were pruned to 7 feet high in a test of tool efficiency. The study of methods was continued with a second pruning from 7 feet to 13 feet four years later, when the stand was in its seventeenth year. Characteristics of the coniferous component of the stand at the two ages were:—

	At 12 Years of Age.	At 16 Years of Age.
Number of Douglas fir over 0.5 inch D.B.H. per ac.	825	713
Total basal area per acre.....sq. ft.	31.06	41.00
Average D.B.H. ....in.	2.6	3.2
Average height .....ft.	19.7	24.5
Lowest green branch .....ft.	0.9	6.2
Lowest dead branch .....ft.	0.0	0.5
Average height of pruned trees.....ft.	23.6	31.1

Double-cutting California or curved-type pruning-saws, the tool found most efficient in the first pruning, were used for the second pruning. To determine the relative efficiency of two methods, the pruning was done by five workers, each using a 10-inch



saw on an 8-foot ladder and a 14-inch saw on an 8-foot pole. The pruning in 1942 confirmed the finding of previous studies that Douglas fir should not be pruned above half the height of the tree; some trees pruned when too small were lost. As previously reported (Forest Branch Report, 1942) the low pruning averaged 6.4 minutes per tree (pruning and walking between trees). Underbrush was very dense in 1942, and it was found that moving from tree to tree used a large proportion of the time. At the present time, hardwood trees in the undergrowth have their crowns above pruning height, and the density of ground-cover has been reduced by heavy shade from the upper canopy. For the current pruning from 7 to 13 feet by ladder and hand-saw, pruning and walking time averaged 5.6 minutes per tree, and saw-cleaning and resting took another 0.7 minutes. The pole saws were less satisfactory for pruning in stands. In this still relatively dense stand the pole saw is tiresome to use, and there is a tendency for the operator to reach around the tree for a branch, resulting in branch-stubs being left. Total time per tree was 13 per cent. more than with ladder and saw. Not the least of the variables affecting pruning time are diameter of tree and texture of wood. This study showed that trees having branches of similar thickness vary from very soft to very hard wood which markedly decreases or increases the effort needed to remove the branches. A history of the rate of healing has been kept for two branches on each of eighty trees pruned to 7 feet high. After two seasons of growth, healing was complete on both sides of 9 per cent. of the trees, and one knot was completely covered on 4 per cent., but one year later the respective figures were 50 and 15 per cent. After spring pruning, growth callous starts to form immediately and, after three years, more than half of the wounds are totally occluded. Thereafter, continuous growth-rings will add clear wood on the pruned trees. The amount of healing relative to the size of wound will be worked out when all wounds are completely closed. Healing is most rapid on trees pruned tangential to the bole, slightly less when the collar of bark at the base of branches is left, and much slower when pruned with shears or axes. Two methods of pruning to a height of 13 feet in one operation were tried this year. It was thought that, in stands of very dense undergrowth due to incomplete crown-cover, climbing the trees would compare favourably with using a ladder in pruning. Two acres of a plantation were pruned under these conditions, using two operators and marked trees. Pruning in one step with ladders was less laborious and took only three-quarters of the time required for the same operation by climbing. The ladder-and-saw method required 7.7 minutes per tree (6.6 minutes pruning, 0.6 minutes walking from tree to tree, and 0.5 minutes resting and cleaning saws). To do the same operation in two steps—that is, to prune through the stand to 7 feet high from the ground and then to take the ladders through for the second step—took over 40 per cent. more time. To make a two-stage pruning four years apart leaves a knotty core below 7 feet similar in diameter and taper to the core above this height, but it may be cheaper in some circumstances to delay the first pruning until it can be made in one step to 13 feet on trees 4.5 inches D.B.H. at age 17 years or more for Douglas fir.

Operations this year emphasize the effect of utilization on thinnings. Because cuttings in very young stands have to be left on the ground, there is a tendency to remove a minimum volume in thinning and cleaning. Topography is a consideration in the extraction of cuttings; in order to economically thin plots and compartments, stands must be located where there is no adverse grade to the nearest truck-road. Current thinnings from a 35-year-old stand of Douglas fir were absorbed by the export market for pit-props. All cuttings between 4½ inches and 7 inches D.B.H. were peeled and cut to 7 feet, 6 feet, or 4½ feet. A few large trees which should have been cut at a younger age were removed and used for mine slope-timbers. A few small trees cut were left on the ground. The remainder yielded 4 cords per acre, or a value of \$48 per acre at the forest for disposal of the cuttings.



*Northern Coast Forest.*

Regeneration adjacent to Skidegate Lake, Queen Charlotte Islands, was sampled by the stocked-quadrat method on four lines of quadrats. On all conditions of site investigated restocking was excellent. The results on comparable burned and unburned areas, together with an unburned area of opposite aspect, are shown in the following table:—

Type.	Percentage of Quadrats stocked in 1946.	PERCENTAGE COMPOSITION.			Number of .004-ac. Quadrats.
		Spruce.	Hemlock.	Cedar.	
Aspect south—					
Logged 1940-1, not burned.....	97	35	53	12	36
Burned 1942.....	82	48	27	25	40
Aspect north—logged 1938, not burned.....	87	15	80	5	30

Reproduction on the unburned areas resulted from numerous seed-trees left after logging. Apparently, in this type, satisfactory restocking is as readily obtained on southern slopes as on northern slopes, but the unburned northern aspect induces a greater proportion of hemlock reproduction in relation to spruce and cedar. Hemlock seems to reproduce better on unburned sites, but this difference could be due to variation in composition of the seed-supply, as well as difference in treatment of site.

## PERMANENT STUDY-PLOTS ESTABLISHED AS AT 1946.

Description of Project.	NUMBER OF PLOTS.	
	Project.	Group.
Growth and yield studies.....	.....	559
Coast forest types.....	405	
Southern Interior types.....	17	
Central Interior types.....	187	
Silvicultural studies.....	.....	47
On cut-over land—		
Seed dissemination from standing trees.....	14	
Survival of seed trees.....	4	
Artificial seeding.....	2	
Growth of exotic trees.....	1	
Competition between broom and Douglas fir.....	1	
In young stands—		
Thinnings.....	7	
Prunings.....	7	
Christmas tree cuttings.....	1	
In mature stands—		
Selective cutting.....	4	
Slash-disposal methods.....	6	
		Total Area of Plots (Acres).
Regional studies.....	.....	15.9
Natural regeneration in representative districts—		
Alberni, Vancouver Island.....	1,200	4.8
Cowichan Lake, Vancouver Island.....	600	6.0
Alouette Lake, Fraser Valley.....	500	5.0
Skidegate Lake, Queen Charlotte Islands.....	80	0.1



## SOIL SURVEYS AND RESEARCH.

As a result of some casual studies made in 1941, it was suggested that the ground vegetation might be used as an indicator of forest-site quality. This was developed into a research programme in 1944. Progress reports have appeared in Forest Service reports for 1944 and 1945. Studies in the Douglas fir types were completed during 1946, and a preliminary report on the classification of forest-site quality by the use of the natural vegetation is being prepared for publication. A brief outline follows.

The quality of a site is fundamentally the result of physical, chemical, and biological activity reacting with the soil and climatic environment. The biological concept of site is based on the assumption that the natural vegetation, after a period of competition in which the unadaptable species perish, approaches an equilibrium with the complex of growth factors. Specific plant communities are, therefore, the result of, and are expressive of, the growth factors characterizing different growing-sites. This is the theory of A. K. Cajander, who first developed the use of plant indicators for forest classification in Finland. The studies in question constitute an attempt to adapt Cajander's theory to Pacific North-west conditions.

The area of study was first confined to second-growth Douglas fir on Vancouver Island and the Lower Mainland of British Columbia. During the past summer the work was extended (through the courtesy of the United States Forest Service) to western Washington and Oregon. This entire area is an ecological unit called the Coast Forest Climax Formation.

Throughout this area there is a remarkable constancy in the composition of the different plant communities that were found to be indicative of site quality. Five main plant communities or site types were recognized.

In spite of the observed constancy in the composition of these site types, certain modifications in the composition of the plant cover were noted which corresponded with small climatic variations within the general climatic province. For this reason it has been necessary to recognize climatic subdivisions, four of which are briefly described as follows:—

- A.—Wet temperate climate with summer fogs. Occurs as a narrow belt bordering the ocean-front. Hemlock, cedar, and spruce forests general.
- B.—Humid temperate climate with a moderately dry summer period. Occurs on south-east coast of Vancouver Island, eastern exposure of Olympic Mountains, and western exposure of Cascade and Coast Mountains. Douglas fir with some cedar and hemlock general.
- C.—Humid temperate climate with pronounced moisture deficiency during summer months. Occurs on southern tip of Vancouver Island; Tacoma-Chehalis area, Washington; and Willamette Valley, Oregon. A Douglas fir invasion of prairie and oak groves characteristic.
- D.—Sub-humid temperate climate with a short frost-free period of less than 120 days. Occurs at elevations above 2,000 feet and in inland shielded valleys. Douglas fir, cedar, hemlock, and some *Amabilis* fir general.

It is possible that there are two or three more subdivisions typical of the climatic extremes of the Coast Forest Climax Formation which have not yet been studied in detail.

Before summarizing the composition of the five plant communities indicative of site quality, a brief outline of the important features of a plant community is necessary. A plant community is essentially homogenous in respect to the dominant and other frequently occurring plant species. The occurrence of any individual species is not confined to any one plant community, but it is the combination of a number of species having respect to vigour and abundance that is characteristic. A few species are found to be exclusive to one community only, but their occurrence is generally sporadic.



In the field, changes in the complex of growth or site factors tend to occur in a progressive fashion, consequently corresponding changes in the vegetation will occur as gradual transitions. For this reason the description of a site type cannot be reduced to precise terms, and the recognition of site types in the field must be based on an appreciation of natural trends between "pure" types. The five main plant communities or site types are named for the most conspicuous species of the respective communities. They are as follows:—

1. P type or *Polystichum* (Sword fern) site type.
2. P G type or *Polystichum-Gaultheria* (Sword fern-salal) site type.
3. G type or *Gaultheria* (Salal) site type.
4. G Pa type or *Gaultheria-Parmelia* (Salal—"pale green" lichen) site type.
5. G U type or *Gaultheria-Usnia* (Salal—"bearded" lichen) site type.

The following summary of the composition of these site types is based on studies largely centred in Climatic Division B, the most common in the Douglas fir region. The modifications of these site types when occurring in other climatic subdivisions will also be discussed briefly.

### 1. P type or *Polystichum* (Sword fern) site type.

This site type is characterized by a wide variety of hygrophytic plants. The dominant-codominant combination consists of any two of the following: Sword fern, May leaf, *Oxalis*, *Vancouveria*, and Wild lily of the valley.

Three or more of the following species are always present: Elderberry, Devil's club, Woodrush, Lady fern, Deer fern, Maidenhair fern, Salmonberry, Miner's lettuce, Tiarella, Fairy bell, Twisted stalk, and False hellebore.

*Mnium* moss appears to indicate this site when growing on the ground and decayed logs.

Salal and Oregon grape are frequently absent from this site type, and, if present, they grow with a low abundance and vigour.

### 2. P G type or *Polystichum-Gaultheria* (Sword fern-salal) site type.

This is an intermediate type between the first and the third. The dominant-codominant combination consists of Sword fern or May leaf or *Oxalis* or *Vancouveria* and Salal or Oregon grape.

One or two of the hygrophytic species listed above are generally present, but more than two is indicative of the P type rather than the P G type.

One or more of the shrubs listed in the next site type may be present, though their occurrence is not general.

The most indicative feature is the conflict between the dominants of the P type and the G type for supremacy.

### 3. G type or *Gaultheria* (Salal) site type.

In this site type Salal and Oregon grape form the dominant-codominant combination. Sword fern, May leaf, or *Oxalis* are generally present but do not grow with the vigour or abundance characteristic of the better sites.

The absence of the hygrophytic group of plants can be considered as evidence of this site type.

A number of shrubs occur quite frequently. They include Waxberry, Ocean spray, Saskatoon berry, Wild rose, and Honeysuckle.

A characteristic of the G type is that Salal and one or more of the shrubs frequently form a high shrub layer (over 4 feet tall).

*Mnium* moss is replaced by *Dicranum* moss in this site type.

Tree lichens are quite common.



#### 4. G Pa type or *Gaultheria-Parmelia* (Salal-"pale green" lichen) site type.

Salal and Oregon grape invariably form the dominant-codominant combination.

Sword fern and May leaf may be present but with a very low vigour. The hygrophytic plants are entirely absent.

Any of the shrubs of the G type may be present.

A new group of plants indicative of poor sites may be noted. They include Prince's pine, Coral root, Poque, Lupins, Kinnikinick, and several of the *Monotropaceæ* family.

The most characteristic feature, however, is the increased abundance of tree lichens. The most abundant and common species is *Parmelia* (provisionally called "pale green" lichen).

#### 5. G U type or *Gaultheria-Usnea* (Salal-"bearded" lichen) site type.

Again, Salal and Oregon grape invariably form the dominant-codominant combination. Other plants of this site type include those mentioned under the G Pa type. Prince's pine and rose occur frequently and with fair abundance.

Some of the "dry" mosses, such as *Racomitrium*, *Hypnum*, *Polytrichum*, and *Dicranum*, are indicative of this site type.

Tree lichens are most abundant and conspicuous. Besides *Parmelia* or "pale green" lichen, *Usnea* or "bearded" lichen is notable.

Studies to date in Climatic Subdivisions A, C, and D are somewhat limited. It appears, however, that the site types described above can be recognized in all climatic divisions. There are some species though that tend to occur more frequently in one climatic subdivision than another, thus modifying the general description.

In Climatic Subdivision A the following hygrophytic species occur frequently in the P type: Bleeding heart, Swamp currant, Woodrush, Devil's club, Elderberry, Deer fern, and Salmonberry. Two species, Blueberry and False azalea, while not good indicators of site quality, seem to characterize Climatic Division A.

Climatic Subdivision C is characterized by the absence of those species typical of Subdivision A. Species more common in Subdivision C than B include Brome-grass, Silver green, Sweet Cicely, Bedstraw, Strawberry, Wild lettuce, Waxberry, Ocean spray, Saskatoon berry, and Honeysuckle. A number of species are almost exclusive. They include Mahonia or tall Oregon grape, Poison oak, Sandwort, Yerba Buena, Arbutus, Bird cherry, and oak. Grass and Silver green in some cases occur as dominants in the P and the P G types. The shrubs may be found in all site types.

In Climatic Subdivision D the addition of the following species modify the general description: Bunchberry, Queen's cup, Mountain blueberry, Pine lily, and False box. Twinflower also occurs with considerable abundance.

In this brief summary no mention has been made of a number of species that appear to have no indicator value, being common to all sites. It has not been possible to mention a number of other characteristics, nor trends of vigour and abundance that are important in site identification.

The height and volume growth of Douglas fir associated with each of these site types is illustrated in Figs. 1 and 2. It should be emphasized that these stand statistics have been computed independently for each site type. The inclusion or rejection of any data was on the basis of the natural vegetation and not on mensurational data of the stand itself. This is in contrast to the conventional method of classifying site quality by the height-growth of dominant and codominant trees, as illustrated by the British Columbia Forest Service and the United States Forest Service site curves shown on the same figures.



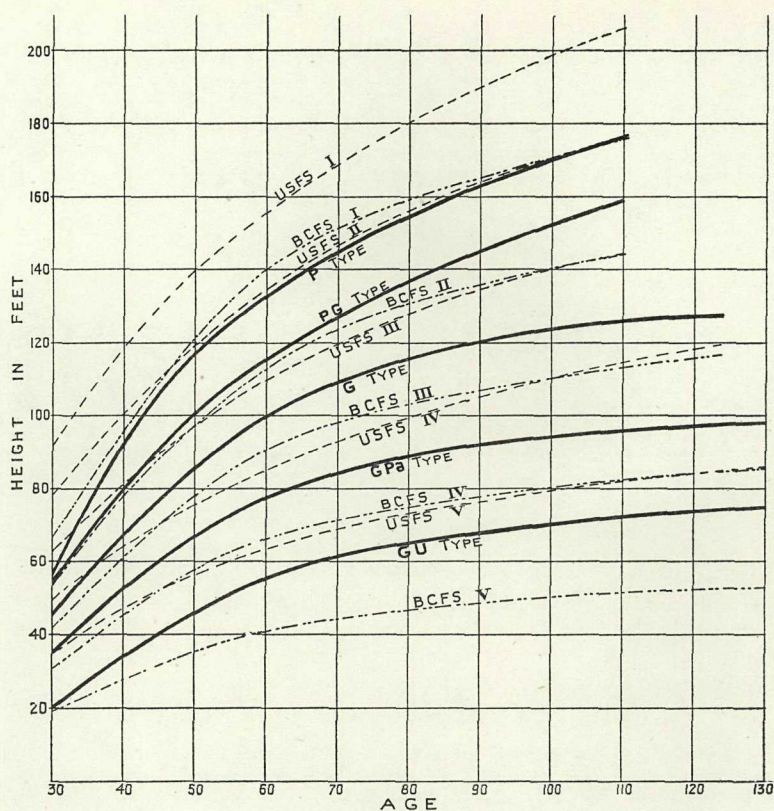


Fig. 1. Average height of dominant and codominant trees, by site types, for Douglas fir.

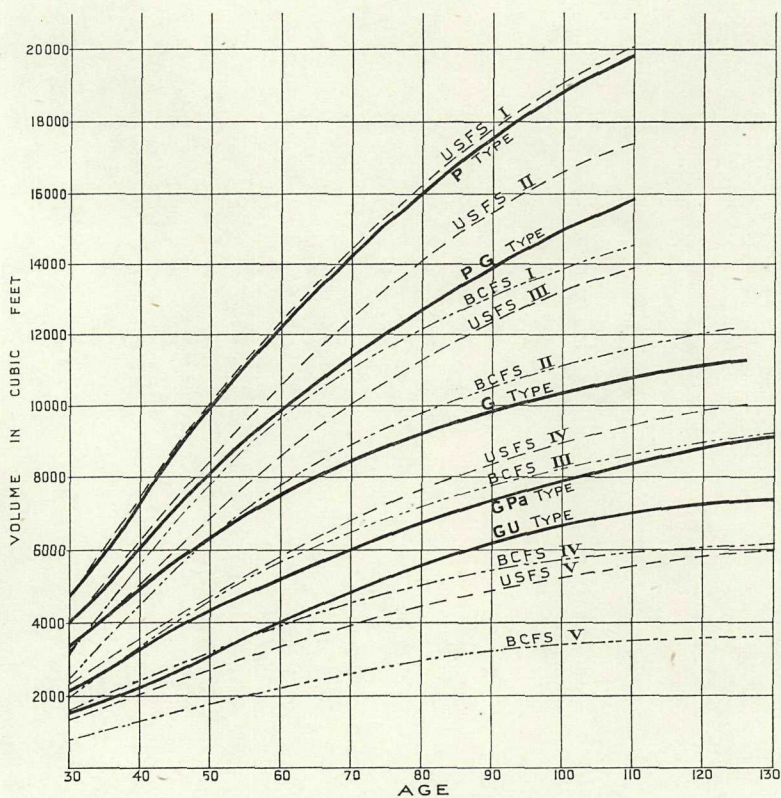
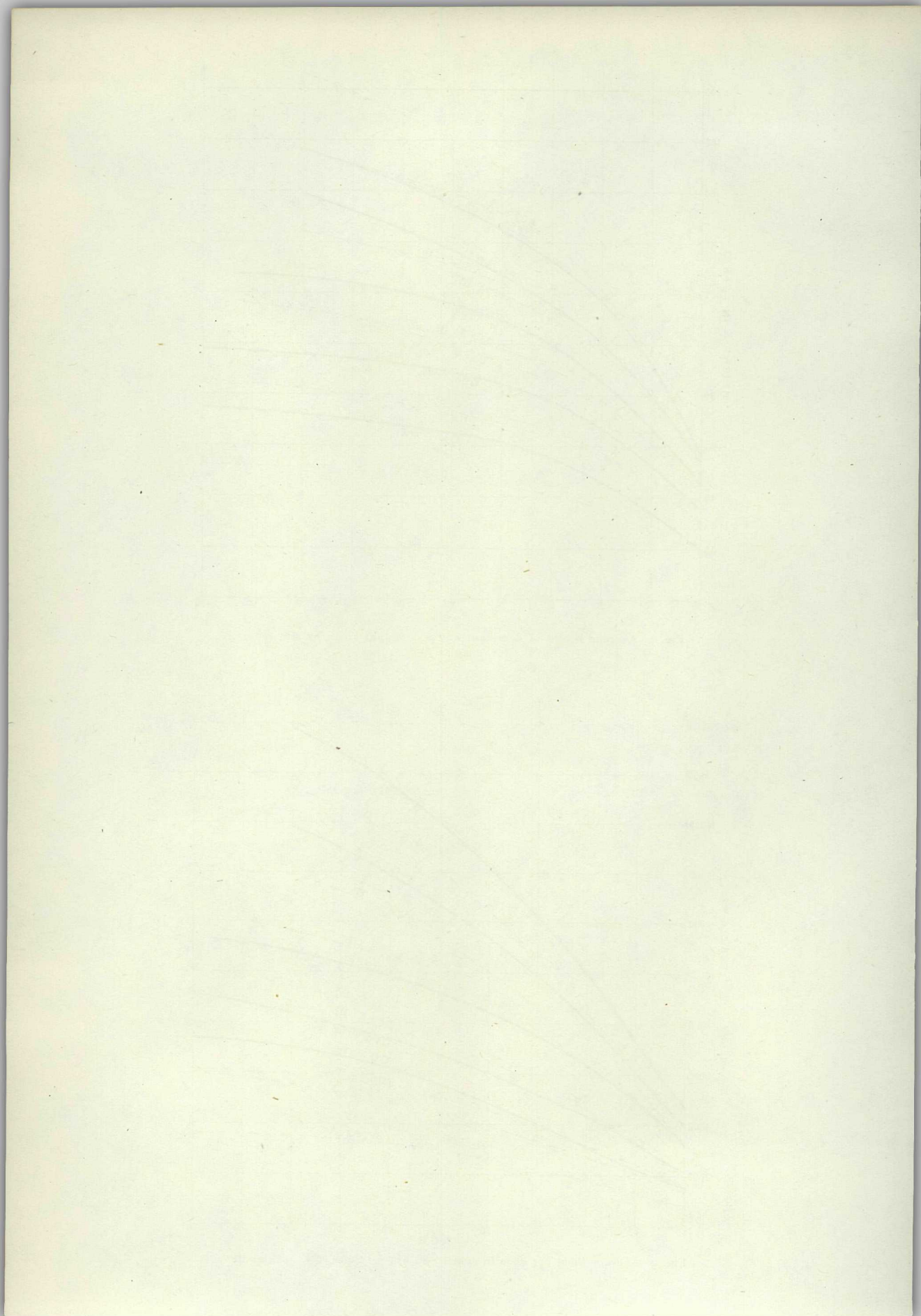


Fig. 2. Average yield per acre in cubic feet, by site types, for Douglas fir.







There are a number of reasons for believing that this classification of site by the use of the natural vegetation is an improvement over the conventional method in which sites are graphical abstractions derived from a purely mathematical treatment of height data. The most practical advantage is that, in the field, changes in site are readily observed, through changes in the ground-cover, as an area is traversed. This means that sites can be accurately delineated and mapped. This is not possible when height-growth is used as a criterion of site quality, unless very numerous samples of height and age determinations are systematically taken over the area.

This study of site classification cannot be regarded as completed, for there are several other climatic regions within British Columbia where an entirely new vegetation will be found. One phase, however, is believed to be completed in that sufficient data have been studied to establish the principle that plant communities do indicate site quality in the Pacific North-west.

During the past year a study was started relative to the identification of site types in recently logged and burned areas. The vegetation on these areas is greatly modified from that which was originally present under green timber. This is regarded as a most important study, complementing the original study of site indicators. The results to date would suggest that the ground-cover does indicate site quality within a few years after burning. More information is needed before a definite statement on this problem is possible.

#### PROVINCIAL PARKS.

Although no major change in Provincial Park acreage occurred during the past year, there were several additions and subtractions. Kitsumgallum Park, 25 acres in area and located on the shores of Kitsumgallum Lake, north of Terrace, British Columbia, was created a Class "A" park. White Rock Park, a Class "C" park, was eliminated as a Provincial Park and turned over to a local park board for administration. Water-power developments at Elk Falls necessitated the elimination of 246 acres from Elk Falls Park.

The following table summarizes the Provincial Parks in British Columbia to December 31st, 1946:—

Classification.	Number of Parks.	Acre.
Class "A" .....	17	288,681.6
Class "B" .....	4	7,054,206.0
Class "C" .....	27	3,994.4
Administered under special Park Acts .....	3	1,656,455.0
Totals .....	51	9,003,337.0
		or 14,067.7 sq. miles.

As in preceding years, park funds were insufficient to undertake any large-scale development-work, but the usual maintenance-work and small improvements were carried on in all the most important parks.

On Vancouver Island the most northern park, Elk Falls, was closed to the public because of the water-power construction project. However, the remaining Island Parks—Stamp Falls, Little Qualicum Falls, Englishman River Falls, and John Dean—were in charge of park attendants who recorded over a 10 per cent. increase in park visitors from the year before. Little Qualicum Falls recorded over 4,400 visitors during one summer month. Basic facilities, such as water-supply, camp-sites, and safe swimming-pools—almost a necessity for such large numbers of people—were never made in the original developments nearly ten years ago and have been impossible since. All the Island Parks are increasing in popularity, and to meet this influx of visitors, a considerable programme of renovation and expansion is urgently needed.



Park furniture and signs were prefabricated during the winter and later placed in position in the various parks. This method of construction proved to have many advantages over work in the field.

Peace Arch Park at the International Boundary near Blaine continues to give many thousands of visitors a very favourable and attractive welcome on their entry into Canada. The painting of the arch, as a joint British Columbia and State of Washington project, was the main improvement carried out this year. The establishment of picnic-grounds, parking area, and other necessary facilities would do much to prolong the stay and add to the convenience of the many visitors.

Mount Seymour Park received considerable attention both in the attempts to have a portion of road constructed and in general improvement-work carried on at the higher levels. A special allotment provided for moneys to be used in road-construction, and tenders were called for a 2.3-mile section of road. No acceptable tenders were received, so authorization was given to the Forest Service to undertake the construction of the first section of the road. By the end of December, 1946, 2.7 miles of the original right-of-way had been reslashed and roughed out. An auxiliary project was the repair and gravelling of the present access road to the parking lot.

The administration building at the 3,300-foot level received light and water systems, furnace, and other necessary improvements to make it more habitable for the Park Ranger. The snow reached a depth of 22 feet around this building last winter and gave a thorough test to the rugged type of construction. A dam and diversion-ditch were completed, which will now make it possible to add to the Park an area previously held by the Greater Vancouver Water District. The range of the ski-jump has been extended by the erection of a 30-foot trestle. Considerable work was also done on the main trail. Nearly a hundred applications for cabin-sites in this Park and the subsequent surveys, interviews, checking of plans, and inspection of sites occupied a great portion of the year's general administration programme.

Manning Park received a Park Ranger for the first time, and temporary Ranger headquarters were built during the summer. In expectation of the construction of a commercial resort, a survey was made and stakes set for the main unit and also for the final Ranger station. Seven fires were fought within the Park, and, although the damage was greatly lessened by having a Ranger on duty, the need for a more comprehensive system of fire detection and suppression was strikingly apparent. A general reconnaissance of the Park provided valuable information for planning lookouts, trails, and camp-sites.

Wells Gray Park was administered almost directly by the District Forester at Kamloops. A Ranger was in summer residence at the Hemp Creek headquarters but, as most of his time was taken up on forest protection and land inspections, park improvements were negligible. The need of a road to Dawson Falls to open the Park to approved commercial concerns and tourists was shown by the number of inquiries and plans presented by interested parties during the past year.

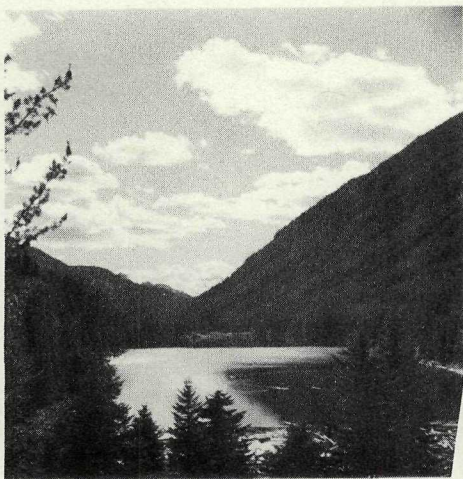
A small amount of trail-work was done in Tweedsmuir Park by local guides in an endeavour to keep the many miles of trails in passable condition for trail-riding parties.

Five areas were examined during the summer for park potentialities, and considerable map preparation has been done in the study of a proposed park to embrace the Forbidden Plateau on Vancouver Island. New maps are also in the course of preparation for Mount Seymour and Manning Park.

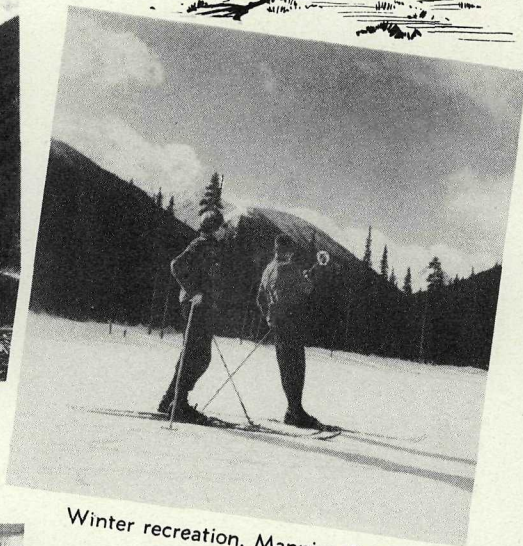
The Garibaldi Park film was edited and released during 1946 and, together with the Tweedsmuir Park film, has proven to be one of the more popular of the seventy-five films in the film library. The Mount Robson film has been edited but is not yet titled. A start on a sound movie of Manning Park was made during the summer and should be completed in 1947.



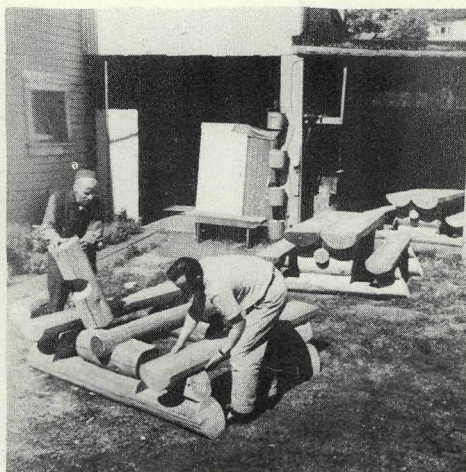
# Provincial Parks



Lightning Lake, Manning Park.



Winter recreation, Manning Park.

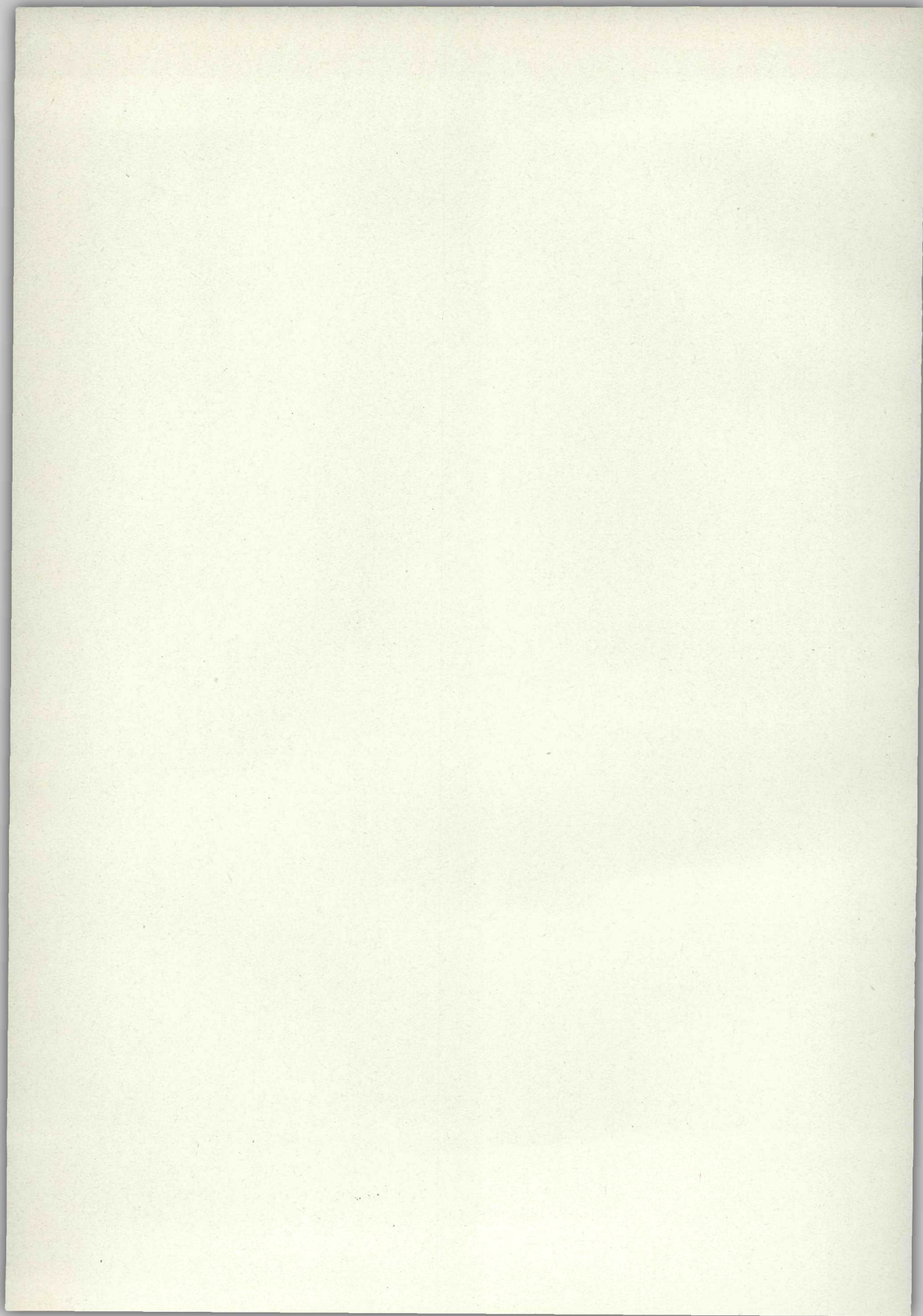


Picnic tables for Provincial Parks.



Cabin-building in Mount Seymour Park.







## REFORESTATION DIVISION.

A new division was established near the end of the year to look after the reforestation programme. Formerly this work had been carried on as a section of the Economics Division but, with increased personnel and expenditures, a new division was created to work towards the objective of twenty million trees annually.

### FOREST NURSERIES.

The first seed-beds at the Duncan nursery were sown in the spring and, although disappointing, the 50-per-cent. germination and survival was to be expected in the development of a new nursery-site. Most of the loss was attributable to the excessive rains during the early summer and the prevalence of weeds on a new area. All land-clearing was completed, and the irrigation system was extended as far as supplies of galvanized pipe would allow. A contract was let for the building of a workshop and implement-shed, to be completed early in 1947.

At the Green Timbers and Campbell River nurseries, production was increased to 7,000,000 and 6,000,000 trees respectively. This was achieved by increasing the number of seed-beds and also by increasing the density of seed broadcast per square foot by 20 per cent. Owing to a shortage of labour and materials, it was only with great difficulty that the seed-beds were sown, and the use of student labour after school-hours was necessary to complete the work.

Weather conditions for the 1946 season were generally abnormal, with May being exceptionally dry, and June and July unusually wet. This wet weather was responsible for excessive growth in the 2-0 stock, especially at Campbell River, and, as a result, a considerable quantity of stock will have to be culled due to its large size.

Further experiments were carried out on the best fertilizer crop to use and, also, on use of commercial weed-killers. The new 2-4-D weed-killer was tried out with great success on practically all weeds, and especially on Canadian thistle and mare's-tail, which are among the more serious pests. When, however, experiments were carried out in the seed-beds, it was found that even the weakest solution, which had no effect on the weeds, was fatal to the seedlings.

A machine for the purpose of spreading the soil over the seed-beds was designed and constructed at Green Timbers, and tests have proved it very successful. With only a few minor adjustments, the machine was used to spread 1,600 sacks of hardwood sawdust for winter mulch.

### SEED COLLECTIONS.

No collections were made in 1946, since the seed crop on the Lower Coast was a complete failure for all forest species but, as a result of the large collection made in 1945, we still have on hand sufficient seed for two years' planting production.

### RECONNAISSANCE AND SURVEY-WORK.

Considerable reconnaissance was made of logged lands on the Lower Mainland to determine what areas may require reforestation. Of the 34,700 acres examined, only 10 per cent. could be planted. This is attributed to the fact that areas which have been logged and burned will, if not fully restocked after five years have elapsed, have grown up in deciduous growth to such an extent as to make planting of coniferous species inadvisable.

Detailed surveys were made of areas previously examined, and maps were completed for four more planting projects with a total of 20,000 acres.



---

PLANTING.

A slight improvement in the labour situation made it possible to carry on five planting projects whereby a total of 3,670,200 trees were planted on 6,000 acres. These projects were located at Jordan River; Hillcrest, near Duncan; Robertson River Valley, near Cowichan Lake; Loveland Lake; and Salmon River, near Campbell River. Private companies planted 3,854,200 trees on 4,700 acres, which exceeded the total of all previous plantings by industry. The complete statistics for the 1946 projects and a summary of planting for the last ten years will be found on page 60 of appendix.

No plantations were destroyed by fire during 1946 and total losses due to fire remain at 621 acres.

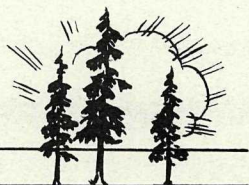
Planting projects on Crown land were carried on under adverse weather and labour conditions. In spite of the increased wages, it was difficult to keep crews up to strength and, at one project, army personnel were used. This arrangement was not satisfactory due to lack of interest by the men in the work and the fact that planting was not part of their training.

Considerable progress was made through the year in the preparation of planting-sites and the felling of snags on areas previously planted. A total of 11 miles of new truck-trails were opened up and 156,120 snags were felled on 16,775 acres. Of this total acreage, 9,500 acres are suitable for planting and the remainder are areas previously planted.

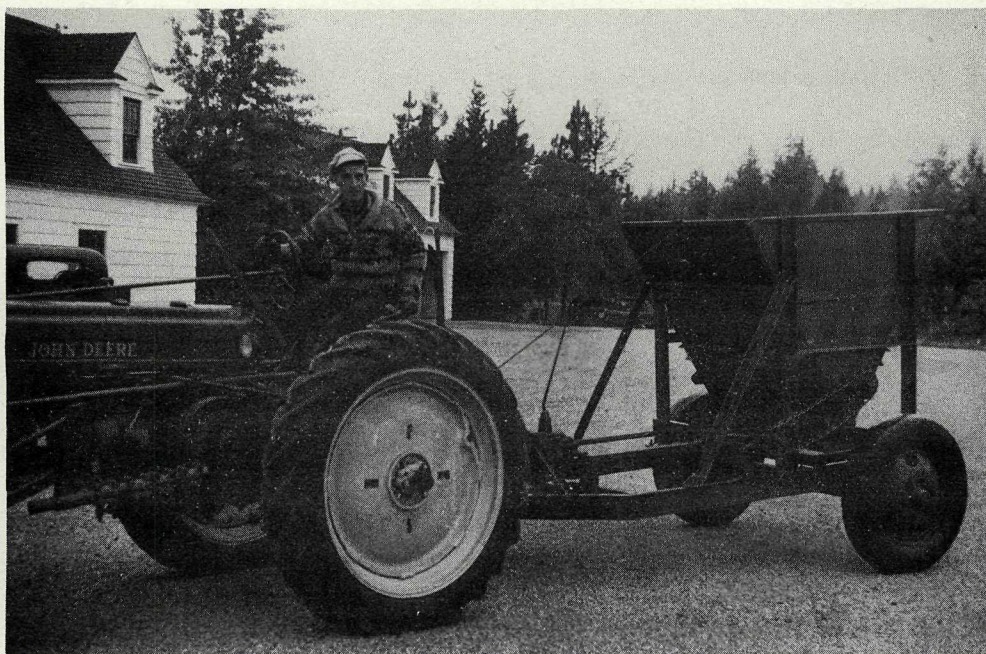


# Reforestation

---



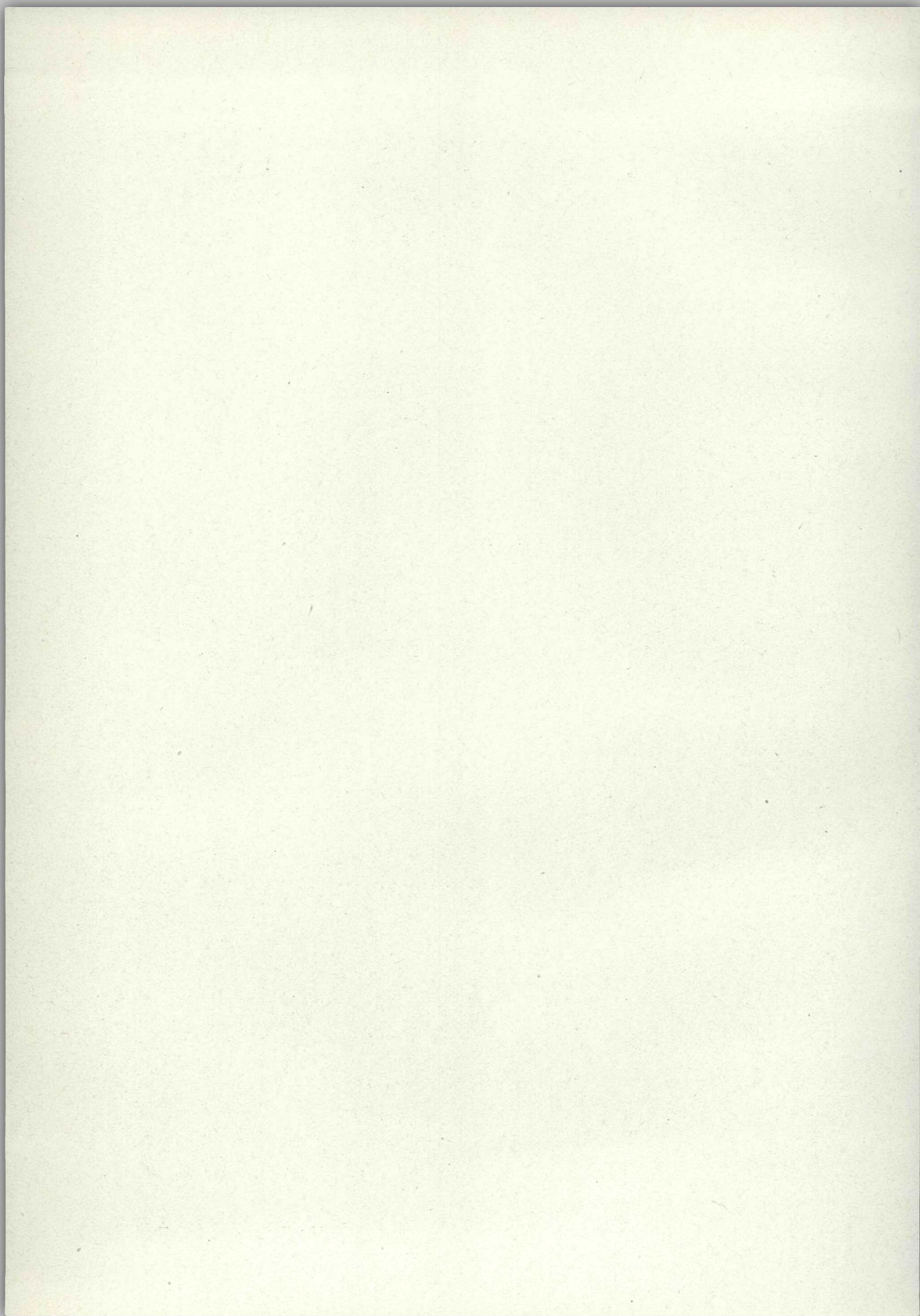
ROOT-PRUNING YOUNG SEEDLINGS.



SOIL-SPREADER DRAWN BY TRACTOR.

---







## FOREST MANAGEMENT.

The estimated value of production for the year 1946 shows a material advance over that of the previous year, largely due to advances in unit values supplemented by some one hundred million feet increase in the total cut.

The 1946 grand total scale expressed in board-feet was 3,194,000,000 or, roughly, 100,000,000 feet in excess of 1945. All the forest districts show a gain with the exception of Prince Rupert.

The Management tables in the statistical portion of the report show details of production, the highlights of which are as follows:—

Water-borne lumber trade remains about the same as in 1945, with the United Kingdom and the Continent taking the bulk of the shipments. It is noteworthy that, with the cessation of hostilities, war-torn countries overseas show a greatly increased volume of shipments. The total volume of 745,000,000 is about one-half of the 1939 volume.

The pulp and paper industry maintained production levels, but values increased materially.

Douglas fir is still the leading species cut, with hemlock supplying about one-half the fir volume and equal in volume to that of cedar; spruce is in fourth place, with about one-half the volume of the cedar.

Alienated lands, particularly Crown grants on Vancouver Island, still supply the major volume, but timber-sales from vacant Crown lands are rapidly approaching an equal production. The third place is held by timber licences.

In the minor products, lodgepole pine pit-props shipped to the United Kingdom are largely responsible for the large scale in lineal feet, totalling some 68,000,000; the total cordage shows an increase, with a slight drop in hewn ties.

In the case of operating areas an appreciable increase is noted in the case of timber-sales and alienated land. The total number of logging inspections reached an all-time high but, with limited staff, the frequency of inspection was not adequate.

Trespass cases reduced somewhat from the previous year in number and in the amount charged.

The number of pre-emption inspections fell off with the decrease in this class of land alienation.

With the return of peace-time conditions and accelerated demand for land use, there was considerable growth in the volume of land examination in advance of settlement. This type of work places a tremendous burden on the field staff with the added activity in forest industry, with the result that the time is rapidly approaching when land examination will require a staff of specialized officials.

Timber-sale cruises increased by some five hundred over the previous year, with a corresponding advance with practically all types of forest materials involved.

In the matter of stumpage prices the general average price shows a slight increase with accelerated demand and advance in values. At the same time the increase in all species has amounted to but 20 cents per thousand feet in comparison with the year 1945.

The number of active sawmills in 1946 increased by some three hundred, mainly of the portable or semi-portable type. This is a natural development by reason of the unprecedented demand for lumber and attractive sale prices.

The total export of logs in board-feet was slightly over that of 1945 but considerably below the average of the past years for the simple reason that local milling facilities were ample to take care of the entire log output.

The total value of minor products shipped from the Province show an advance of some \$2,000,000, attributable in a large measure to pit-prop exports to the United Kingdom.



With the acceleration in lumbering activity, the number of timber-marks issued greatly exceeds that of the previous year, and other office routine was such that headquarters staff was incessantly faced with the difficulty of keeping abreast of the volume of work.

Forest insect survey-work was maintained in co-operation with the Federal agencies, and a creditable showing made in box collections throughout the Province.

Direct forest revenue surpassed that of 1945, and timber-sale stumpage accounted for \$1,658,000 out of a total of \$4,352,000.



## FOREST PROTECTION.

### WEATHER.

From the forest-protection standpoint and considering the Province as a whole, weather during the 1946 fire season was more favourable than it usually is. Usual periodic hazard build-ups occurred throughout the season in all districts, notably in early spring and mid-season but, generally, timely precipitation occurred, nullifying any exceptionally serious condition.

In the Vancouver Forest District rainfall was a little above average, with a dry May offset by an extremely wet June and July. Although August and September offered only light precipitation, it occurred at opportune periods. Extreme hazard periods were of short duration, permitting early control of any potentially threatening situation. A distinct break in the weather early in September, followed by light fall rains, closed the season.

In the Kamloops District an almost unprecedented spring hazard developed in the northern portion of the district, accounting for many early range fires. This condition continued almost unabated throughout most of the season and, as a result, that portion of the district was a continuous trouble-spot for fire throughout the fire-season months. Elsewhere in the district, weather conditions were normal, except for one series of dry lightning-storms which, for a seven-day period in August, swept the southern section, notably the Ashnola Valley, the area east of Okanagan Lake, and a 30-mile strip along the International Boundary. Heavy electric storms were also in evidence in the Columbia River area but were abortive from a fire standpoint due to opportune precipitation.

Weather in the Nelson District was considerably more favourable than during average seasons. Mean temperatures were generally lower and precipitation higher, with the latter showing better distribution throughout the season. The month of July, as usual, was extremely dry and was the most troublesome period experienced. Fortunately, electric storms were not experienced in serious proportions until the end of that month, when a number of heavy disturbances occurred throughout the district, with the conditions worst in the Creston-Cranbrook and Upper Arrow Lakes areas. Storms were frequent and widespread during practically all of August, nine major storms being recorded. However, these storms were usually accompanied or followed by rain, and resulting fires were comparatively few. The longest intervals between measurable precipitation were forty-nine and forty-one days in the Boundary and East Kootenay areas respectively, extending from the middle of June to the end of August, and twenty-one days in the West Kootenay between mid-July and the first part of August. High winds were much less prevalent than in previous years—a very appreciable factor in the lighter season experienced.

The season in the Coastal region of the Prince Rupert Forest District, including Queen Charlotte Islands, opened with a moderate hazard, registering increase throughout May and the first week of June. Fortunately, weather was calm throughout this period, and hazard did not assume dangerous proportions before the weather broke. Heavy rains in late June and occasional heavy showers during July resulted in a light-hazard level, which was maintained for the balance of the season until heavy fall rains in early September. In the Interior portion of the district, snowfall during the winter months was considerably heavier than the previous year's, and the usual January thaw, with heavy rains, did not materialize. As a result, the snow remained light and dry and disappeared rapidly early in the season. Hence, hazard build-up commenced early in the fire season, and a peak spring hazard obtained throughout most of May. Heavier-than-average rainfall throughout June and July gave favourable and safe conditions until about mid-August, when a hazard period of roughly a month's duration developed.



Copious rains early in September closed the season. Electric storms were rare and in all cases were accompanied by precipitation.

In the Fort George Forest District winter and early spring conditions were very similar to those in the Interior of the Prince Rupert District, with resulting spring hazard in April and May. General rains about the third week in May, except in the Peace River and Rocky Mountain Trench portion where the dry period was more protracted, eased the situation. In the portion of the district tributary to the Canadian National Railway and Quesnel, rainfall in June and July was heavier than average and weather was variable. A period of dry weather developed in early August, and by the end of that month conditions were becoming serious. Rains about mid-September alleviated the situation and closed the season. It is worthy of note that, while the May and September rainfall in 1946 in this district was only approximately 80 per cent. of the twenty-five-year average, occurrence evenly throughout the season resulted in a season more favourable than the average.

### FIRES.

#### OCCURRENCES AND CAUSES.

Number of fires occurring throughout the Province during the season was 1,707, which is within 5 of the average over the previous ten-year period. For comparison with tables which have appeared in previous reports, distribution of occurrence by forest districts during the past decade is as follows:—

Forest District.	Fire Occurrence during Ten-year Period 1937-46, inclusive.	Percentage of all B.C.
Vancouver .....	4,212	24.75
Prince Rupert .....	701	4.12
Fort George .....	1,570	9.23
Kamloops .....	5,188	30.48
Nelson .....	5,348	31.42
Total .....	17,019	

The small but steady increase in occurrence in the northern portion of the Province was again in evidence due, in large measure, to the general opening-up of these territories. In the table of occurrence by months the serious early spring hazard which obtained is most marked, with something over 21 per cent. of all fires occurring during May as compared to the ten-year average for that month of 11.5 per cent.

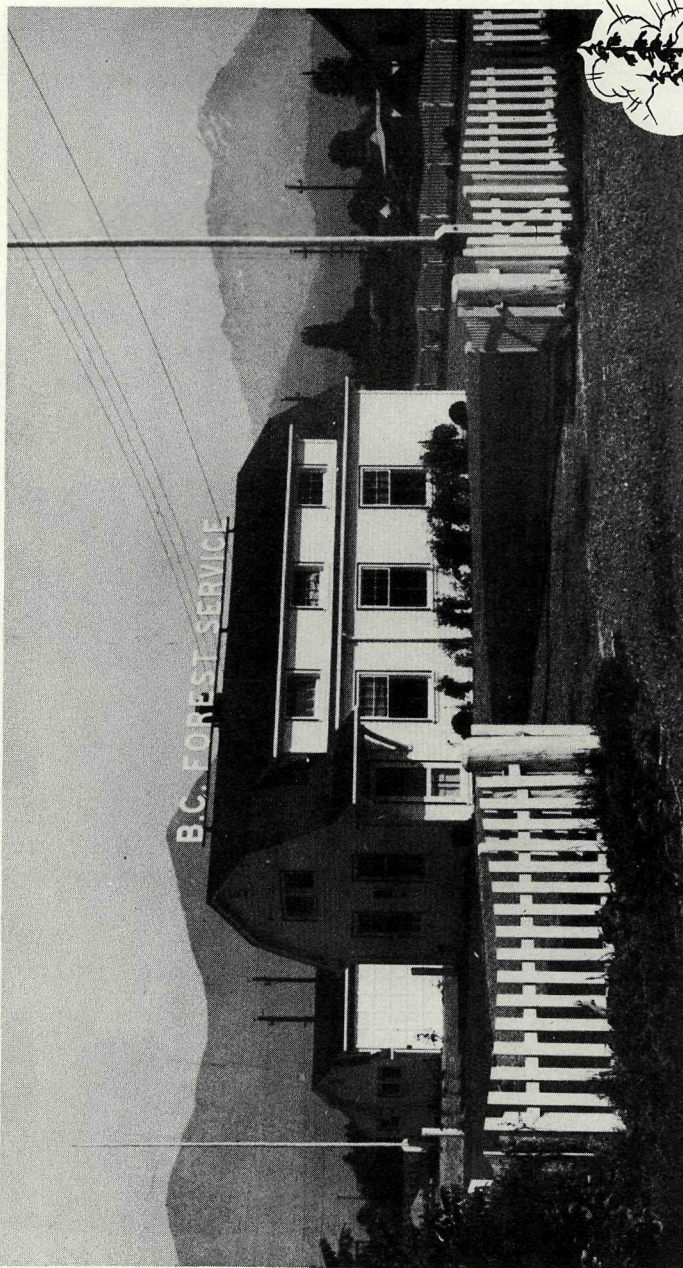
Lightning was again responsible for more fires than any other agency, with approximately 30 per cent. attributable to this source. As compared with the last several years, there was a notable decrease in fires attributable to railways operating, and it is evident that locomotive-stack fires have been drastically reduced due to use of improved type of coal and praiseworthy attention on the part of the companies to fire-prevention. Campers and travellers accounted for approximately twice as many fires as last season, an indication that, after the restricted recreation of war years, many are again spending their holidays in forested areas. There was also a marked increase in number of fires attributable to escaped brush-burning, probably due to the particularly dry spring when most of this land-clearing work is carried out.

#### COST OF FIRE-FIGHTING.

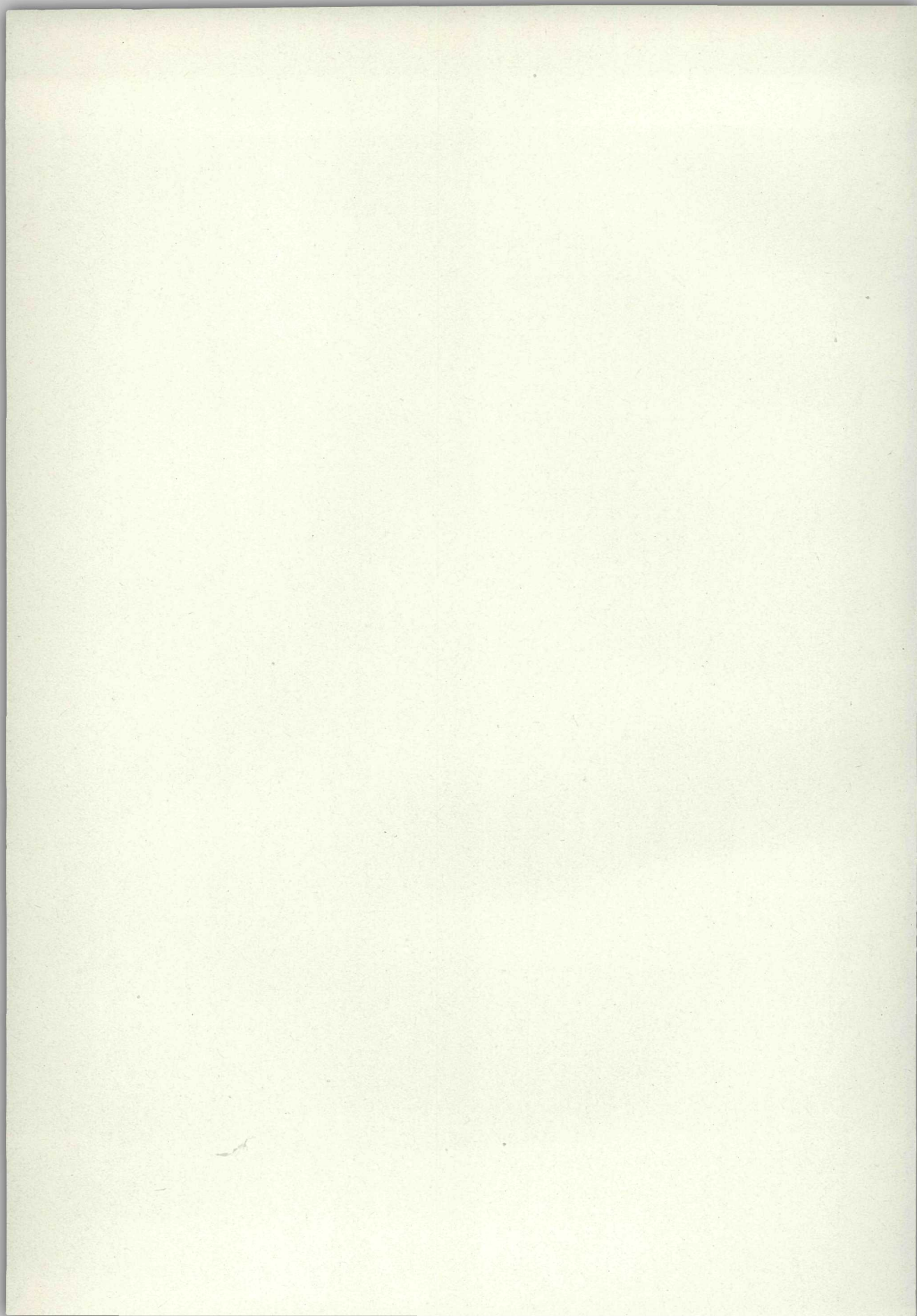
Table No. 52, on page 96, gives full statistics under this heading. It should be pointed out that total cost shown therein covers only expenditure in wages, food, and transportation for crews actually fighting fire and is exclusive of items of forest-



*Chilliwack Ranger Station.*









protection organization overhead, such as seasonally hired personnel. Further, the cost shown represents only cost to the Forest Service and for the figure of total expenditure in fire-suppression for the Province, an estimated sum of \$134,822 (Table No. 41) expended by other agencies must be added.

Once again the greatest proportion of fire-fighting cost to the Forest Service, approximately 63 per cent., occurred in fighting lightning-caused fires. The nature of this type of fire, occurring for the most part in rugged, remote areas, is such that time between detection and attack is invariably prolonged, resulting in increased costs. Fires attributable to escaped brush-burning and campers were the two next most costly types of fires experienced, running 16 and 8 per cent. respectively of total expenditure.

Total cost to the Forest Service for the season was only approximately one-half of expenditure in 1945. This is attributable almost entirely to the more favourable season experienced, as the total number of fires was not appreciably reduced.

#### DAMAGE.

Damage occasioned through forest fires during the year is estimated at \$357,984, only about 25 per cent. of the 1945 figure. Of this total, approximately \$192,000 represents damage to forest-cover, the remainder covering miscellaneous property such as forest products, buildings, and railway and logging equipment destroyed incidental to forest fires.

Slightly less than half of the total damage to forest-cover again occurred in the Fort George District and was largely made up in destroyed second-growth and mature-timber values. The part of that district east of the Rockies in the Peace River area was the chief trouble spot.

Kamloops Forest District was next highest from the standpoint of damage to forests, approximately \$60,000 being the estimated value of cover destroyed in that district. It is gratifying to note that acreage of accessible merchantable timber destroyed in that district is, however, some 30 per cent. of the figure under that heading for last year.

In the Vancouver Forest District, out of a total of 426 fires, only 34 occasioned damage over \$100, and of these only 14 involved damage over \$1,000. Practically half of the total damage estimated for this district was occasioned by industrial-operation fires, about one-third by smokers' fires, and the remainder predominantly lightning fires.

Only 6 fires in the Nelson District exceeded 500 acres in extent, and only 2 of these created appreciable damage. The over-all figure of damage to forest-cover in the Nelson District was notably low as compared to many previous seasons.

#### FIRE-CONTROL RESEARCH AND PLANNING.

##### PLANNING.

After a four-year lapse during the war years, fire-control planning was recommenced during the past season on a modest scale. Two visibility mapping crews were put in the field gathering information necessary for a revision of the primary lookout network on the East Coast of Vancouver Island in the area from Victoria north to Kelsey Bay.

A total of eighty possible lookout-sites were examined, and full data regarding water-supply, possible trail or road location, etc., recorded. Visible area was mapped and a panoramic set of photographs taken for each potential site.

Reports are now being prepared, and it is hoped to have some of the new sites manned and in operation in the 1947 season.



### PANORAMIC LOOKOUT PHOTOGRAPHS.

A small amount of work was done on this project during the season, the effort being limited by lack of trained personnel, suitable transport, and unfavourable photographic weather.

Two points in Kamloops, one in Prince George, and two in Prince Rupert were completed.

The new camera, built to our specifications by the National Research Council at Ottawa, was used for the first time on this work and proved very satisfactory.

### FIRE-WEATHER STUDIES.

#### *Weather-recording.*

During 1945 a fire-weather recording system was initiated to determine fire danger from measurements of humidity and fuel moisture at altitude stations. The second year of experience with this method of recording hazard has substantiated the principle that fire weather is a function of the presence of dry continental air, characterized by a pronounced temperature inversion. To be effective, however, it is essential that stations be so located as to record extreme hazard. Stations too high or too low, relative to the general surrounding terrain, will yield a milder record and thereby lead to underestimation during a risk period.

Fire-weather information was received by radio twice daily at Victoria and Vancouver. Humidity at four-hour intervals was taken from hygrograph records and plotted by individual stations on a monthly wall-chart. Fuel moisture measured at 8 a.m. and 4 p.m. was plotted on a similar graph. The graphical method readily portrayed intensity and trend of drying as indicated by humidity and prevailing inflammability as indicated by fuel moisture. This system enables the extent of relief developed by moderating influences to be readily appreciated.

An arbitrary line was drawn at 60 per cent. relative humidity and, when the trend was above this line, the chart was coloured blue, while red was used when humidity fell below 60 per cent. This level was selected because wood material, exposed to a constant humidity of 60 per cent., will stabilize at about 10-per-cent. moisture content, the critical inflammability point. The colouring scheme worked satisfactorily, the volume of blue indicated the extent of relief at any time, while the volume of red indicated the deficiency prevailing.

Check-stations were again maintained in valley locations at the Cowichan Lake Experimental Station and the Langford Suppression Camp. These recordings confirmed previous measurements in such locations and visibly demonstrated the greater accuracy of ridge measurements. Attention was given to the question whether fire-hazard could develop in valleys while conditions on ridges were registered as moist. Results confirmed previous belief in this regard, provided that measuring location is not too high.

Fuel-moisture sticks used during the season were for the first time dowelled together in sets of three for 60-gram units and four for 100-gram units. This was found to be a very satisfactory improvement and, for the future, it is proposed that all sticks will be dowelled and used in 100-gram sets only. All 60-gram balances throughout the Province have been called in for conversion to 100-gram for future use.

#### *Investigations.*

Considerable advance has been made concerning the measurement of fire-hazard. Similar advance has not developed in either the recognition of the responsible meteorological factors in the study of their advance and progress. Investigations towards this end were planned for the season, but the programme was seriously curtailed by equip-



ment and instrument shortage. However, a number of minor investigations were conducted, as outlined briefly in the following.

A study to determine variation of fire-hazard with altitude was carried out in the Ladysmith region. Previous investigation in this field had been undertaken in the northern Rocky Mountain region, where existence of thermo belt has been fairly well defined. No such research had been carried out at the Coast and, with wide variation of topography, more adequate information was necessary in order that comparative hazard might be adequately appreciated. A series of complete weather-stations were located at varying elevations from the 40- to 3,500-foot level, and fuel-moisture and temperature stations maintained on intermediate 2,200-foot and 3,100-foot levels. Records obtained indicated that the greatest intensity of risk in this area developed from 2,000- to 3,000-foot altitude. Comparison with records of Forest Service lookouts throughout the same risk period, however, indicated that the situation is not uniform, and while the 2,000- to 3,000-foot level is the most dangerous in the Ladysmith area, it is not possible to state that this level is the critical zone in other adjacent regions. Obviously, therefore, independent investigations must be made within each zone. An interesting finding in this experiment was the fact that practically no inversion occurred at any of the experiment-stations set up. This was apparently due to a state of onshore north-easterly wind movement proving again that inversions are confined to higher valleys which receive an indirect flow of air and wherein, during the night hours, calm conditions prevail.

A number of minor studies were made bearing on the broad question of progressive increase or build-up of fire danger throughout the fire season.

The first of these, conducted with the co-operation of the Dominion Forest Products Laboratory in Vancouver, was the investigation of absorption of fuel-moisture sticks under varying conditions of temperature and humidity. The purpose of the study was to obtain some appreciation of the speed and the extent to which sticks are kept to changing humidities, and it was found when sticks were at a moisture-level close to equilibrium with atmospheric conditions, the rate of increase approached the zero point.

A further experiment conducted was designed to ascertain trend of fuel moisture in shady locations. In this study two sets of sticks were placed at both valley and ridge locations—one set in the open, the other in the shade. In every case, fuel-moisture content of the shaded sticks followed a similar general trend to that of the sticks in the adjoining open locations. Moisture content was, however, about 3 per cent. higher throughout the season. A thorough study under this head was made for variation of fuel moisture between sticks placed on the ground and planted 12 inches above the ground. Results indicated that, during each designated period, sticks on the ground remained consistently higher than the sticks above the ground. Differences between the two readings were greater in the morning than in the afternoon and, as the season advanced, the differences between the two locations also lessened. The findings indicated that the present method of exposing fuel-moisture sticks 12 inches above the ground is entirely satisfactory and has rendered a suitable measurement of inflammability.

An investigation to determine comparative inflammability measurement during risk periods at Northern and Southern Vancouver Island stations was also conducted during the season. As northern test indicators, valley and ridge weather-recording stations were established in the vicinity of Port McNeill in the pulp zone and near the south end of Nimpkish Lake in the fir zone. Fuel moistures and temperatures only were recorded as no hygographs were available. Results obtained indicated a mild lowering occurred during hazard periods, but hazard at no time reached a dangerous level and was in sharp contrast with the established Lower Vancouver Island stations. Comparison of the fir and pulp areas showed almost identical trend and indicated con-



clusively that hazard in these areas is influenced by prevailing weather. This study is not considered complete and will be carried on again next year.

Finally, an investigation to determine loss of weight by fuel-moisture sticks when exposed to weather influence was carried out at three Vancouver Island stations. Seven sets of sticks were exposed at each of three locations—Langford, Alberni, and Elk Falls lookouts. One set of sticks was picked up at two-week intervals at each location and weight-loss determined. Little variation in weight-loss was noted between different locations, and loss decreased steadily until August 1st, when it appeared to taper off in a gradual manner. The total weight-loss throughout the season was less than 1 per cent. despite excessive rainfall during the period exposed. The conclusion was that it was unnecessary to make any adjustment in readings to counteract weathering loss in fuel-moisture sticks.

#### FIRE-SUPPRESSION CREWS.

Sixteen fire-suppression crews were organized and, from mid-June to mid-September, were stationed in localities where fires are frequent and rapid suppression action is possible. Twenty crews had been planned, but the lack of suitable personnel and other difficulties prevented two crews being established in each of the Vancouver and Fort George Districts. Except for one crew of ten men, crews were composed as usual of a foreman, a cook, and six men, and each was a self-contained, mobile unit. Crews were distributed as follows:—

Forest District.	Number of Crews.	Fires fought.
Vancouver .....	4	25
Prince Rupert .....	1	<i>Nil</i>
Kamloops .....	6	43
Nelson .....	5	27
Totals .....	16	95

Capable foremen and cooks were difficult to secure because of the higher wages and longer period of employment available in private industry, and the type of crewman desired was not readily obtained. In the past, crews have been made up of high-school students and, though such crews have some advantages, the scope and term of their employment is limited. It was intended this year to use as many adult crewmen as possible, particularly young returned servicemen, but only a limited number accepted and stayed at the work and, in the end, most crews were either students or a mixture of students and adults. The mixed crews worked well, but their period of employment was still limited by the school term. This limitation is a particular disadvantage in the northern districts, where there is usually a flash hazard in May, before the crews can be organized.

The sixteen crews fought 95 fires, compared with 132 fires fought by the sixteen crews in 1945—a reflection of the lower fire-hazard this year. The crew at Burns Lake, in the Prince Rupert District, could not be established until school closed in June and, as the summer hazard did not develop, it was not employed on any fires. There were no changes in fire-fighting equipment, except an increased use of tank-trucks, which seem to be an excellent part of the organization.

During the time personnel were not fighting fire or standing by in hazardous periods, considerable improvement-work was done on forest-protection roads, telephone lines, buildings, and other installations. More could be accomplished if such work was the chief function of the crews and fire-fighting secondary, but the first object is fire-suppression and other work must be arranged so as not to interfere. The most efficient balance is hard to maintain.



The scarcity of suitable men may be expected to right itself in time, but some difficulties are perennial. It requires much time and work to organize, train, and supervise crews each year. This work is done by Forest Officers in addition to their other duties, whereas forest districts employing several crews would seem to require an officer on this work alone for the fire season. When the greater proportion of foremen and personnel are new to the job each season, as is now the case, the work is not simplified nor the efficiency greatly improved year by year. It would be desirable if capable foremen, at least, could be employed the year around to provide an experienced cadre for suppression-work.

## RECORD OF SUPPRESSION ACTION, 1946.

Size of Fire when attacked.	Number of Fires.	SUBSEQUENT SPREAD (BY NUMBER OF FIRES).				
		¼ Acre or less.	¼ Acre to 1 Acre.	1 Acre to 5 Acres.	5 Acres to 50 Acres.	Over 50 Acres.
Spot (up to 1 acre).....	54	50	3	....	....	1
Over ¼ acre and up to 1 acre.....	14	7	6	1	....	....
Over 1 acre and up to 5 acres.....	18	6	4	3	3	2
Over 5 acres and up to 50 acres.....	7	1	....	1	2	3
Over 50 acres.....	2	....	....	....	2	....
Totals.....	95	64	13	5	7	6

## AIRCRAFT.

Tenders were called early in the year, and a two-year contract was subsequently negotiated with a commercial air-line company for charter flying to cover forest-protection requirements. Under the contract two float planes were made available, based in the Fort George District, and two twin-motor land planes for the southern portion of the Province, one based at Kamloops and one at Nelson. Although based at specific points, all aircraft were available on call in cases of special necessity in other forest districts. Usage was chiefly in fire-detection, but light transport work was carried out to a considerable extent in the northern districts with the float planes based there. During the season approximately 336 hours of flying were completed.

Although the aircraft used were fitted with radio equipment, the type of installation obtainable was such that it left much to be desired so far as consistent communication with ground stations was concerned. This detracted to a marked extent from immediate reporting of fires detected. At the close of the season, tests were carried out with new-type equipment, and results of such tests give every indication of satisfactory communication next year. It is proposed that next season all aircraft will have radio equipment capable of operating on the frequency of the district to which the aircraft is assigned and also on a common frequency for use in the event of aircraft being moved from one district to another.

Parachuting of fire-fighting equipment and supplies was carried out successfully, as in past years, in the northern districts. During the season tests were also conducted with a 6-foot diameter smaller chute obtained from the United States war surplus supplies. It was found that these small chutes work very well with light loads, and they are obtainable at considerably lower cost than chutes previously used. Orders have been placed for further supplies of these chutes for the coming year.

## MECHANICAL EQUIPMENT.

## AUTOMOTIVE.

As in many other lines of endeavour, it was hoped that during the year we would have been able to replace much of our old equipment, with resulting more dependable



and economical operation. Unfortunately, due to labour conditions and causes beyond our control, this was not possible.

In so far as automotive equipment is concerned, between the period September, 1945, and April, 1946, ninety vehicles were requisitioned under the then existing "A" priority rating for purchase. At the close of 1946 seventy-two of these vehicles have been delivered. This situation has meant retaining in service many old units which should properly have been discarded some years ago, with resulting unreliable operation and high cost.

Of the new units obtained, four 1-ton delivery-type vehicles were built up as tankers. Design was essentially the same as earlier tanker models, with the exception that water-pumps installed were of a more modern design.

One D-6 crawler tractor and hydraulic bulldozer was requisitioned during the year, but delivery was not received. It is anticipated we may obtain this equipment early in the new fiscal year.

#### FIRE-PUMPS AND OUTBOARD MOTORS.

No new pressure pumps were purchased during the year, but twenty-seven forestry-type units were obtained following disbandment of the civil defence organization. These units were dismantled at the Marine Station, and, by careful selection and purchase of some additional new parts, sixteen complete units were distributed to the districts and placed in service.

Outboards and their repair parts were also in short supply during the year. Out of twenty-eight new units of various power sizes estimated as required for the season, only ten were obtainable, and five of these were purchased in used condition and reconditioned for use.

#### MECHANICAL INSPECTION.

The services of a mechanical-maintenance inspector were obtained during the year as an assistant to the mechanical superintendent. This made possible, for the first time since 1939, proper inspection of all Forest Service automotive equipment, fire-pumps, outboards, and tractors in the field during the year. It is proposed to further supplement the inspection staff in the coming year if suitable personnel is available.

#### FOREST SERVICE MARINE STATION.

As of April, 1946, the Marine Station was set up as a separate entity under direction of a superintendent responsible to head office, Victoria. This change in jurisdiction was designed to relieve the Vancouver Forest District office of considerable work involved in administration, supervision, and detail. The old name, Fraser River Repair-station, was changed to Forest Service Marine Station as more in keeping with the activities there and to clearly differentiate from commercial concerns operating on the Mainland.

Looking towards ultimate expansion of the station and taking advantage of a favourable opportunity, additional water-front property, to the extent of 4 acres immediately adjoining the present station, was purchased at a reasonable cost.

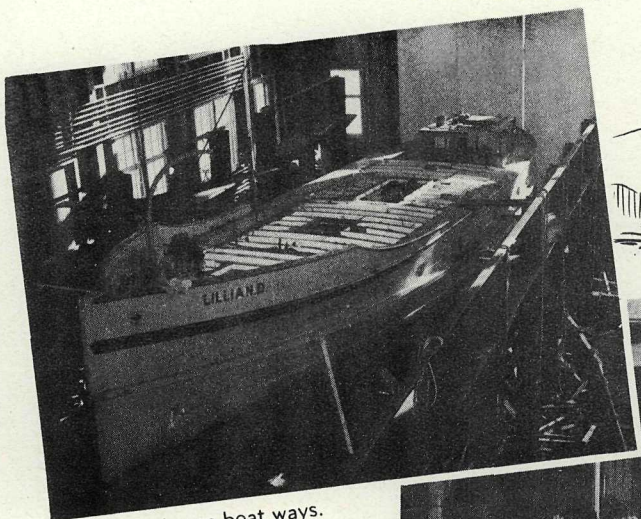
Some further improvement of the old property was made in levelling, using river-dredged material. Lighting equipment and electrical power circuits within the station were modernized and extended to take care of increased load and to bring them in line with the electrical code regulations. Some small alterations were made in office accommodation to meet the changed administrative set-up.

Purchase of shop equipment made necessary by extended activities at the station and difficulties incurred in shopping out work included a 300-ampere Lincoln electric welder, obtained from war surplus stocks, and a DeWalt all-purpose saw.



# *Forest Service Marine Station on the Fraser River.*

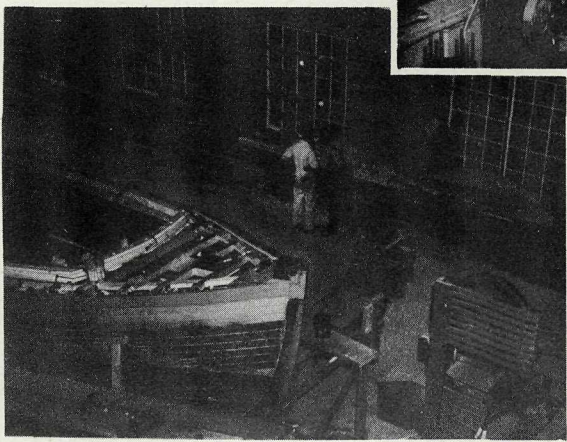
INTERIOR VIEWS.



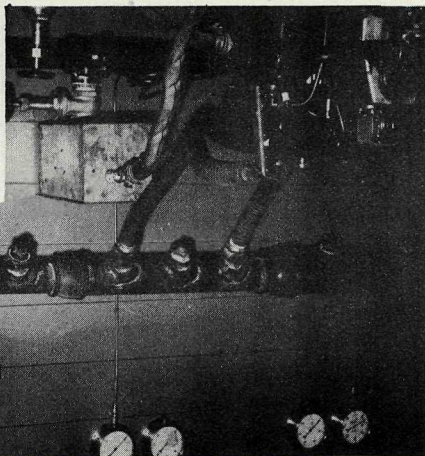
Large boat ways.



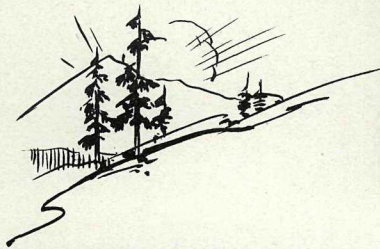
Machine-shop for repair of pumps  
and outboard motors.



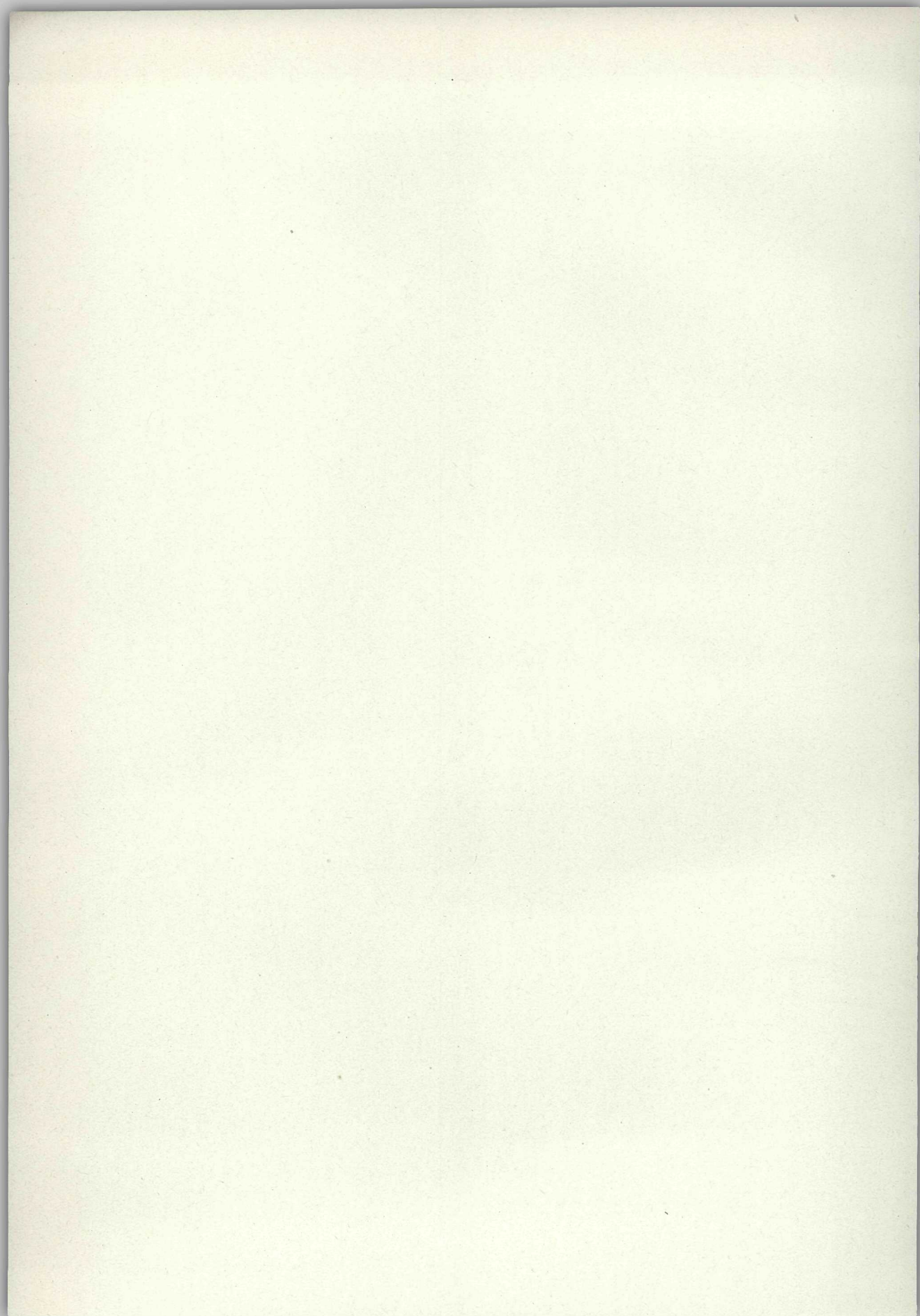
Small ways and ship's carpenters' shop.



Pump-testing apparatus.









Personnel of the station now totals twenty, including superintendent, foreman shipwright, foreman mechanic, two marine mechanics, four ships carpenters, two painters, three pump and outboard mechanics, one mechanic's helper, two clerks, and three watchmen. Of this staff, nine are permanent appointments and the remainder are on a temporary basis. Temporary staff fluctuates as requirements of the work demand.

During the year thirty-two launches passed through the station for overhaul. Delivery was obtained on three marine engines requisitioned last year, and two of these installations have been completed. An additional power plant ordered during the year is still to be delivered.

Construction of one new vessel, the launch "Cherry II.," was completed early in the year, and the ship placed in operation in the Vancouver Forest District as an Assistant Ranger boat. The craft is 35 feet over-all, with 9-foot beam, powered with a marine Diesel unit. The keel of a similar launch of the same type has recently been laid, and work is going ahead as materials become available.

Work on the pump and outboard floor of the station during the year comprised overhaul and rebuilding of ninety fire-fighting pump units, overhaul of thirty-nine outboard motors, and, in addition, construction of various pieces of equipment such as compressors, alidades, etc. Due to the extreme shortage of repair parts, pump gears, rotors, pistons, tanks, caps, and castings were manufactured at the station.

#### BUILDING AND CONSTRUCTION.

Prevailing shortages of material and labour and general high costs prevented other than urgent new construction. General maintenance-work and minor new construction were carried out in various forest districts as in the past.

During the year tenders were called for construction of Ranger stations at Parksville and Birch Island. In the first-mentioned instance tenders were rejected on the basis of excessive cost, and no bids were received for the Birch Island work. These projects, with several others, are proposals for the coming year.

Plans and specifications were drawn and adopted for standard Ranger station buildings. These were of two main types, designed to meet the situation where office space is required within the Forest Service establishment and for the condition where the office is elsewhere and only tool- and car-storage space is required.

Drawings and specifications were prepared for prefabricated lookout buildings, and these will be fabricated at the Forest Service Marine Station. The first of these units should be ready for erection early in the spring.

#### RADIO.

By the close of 1946 the increased size of district networks made necessary some long-anticipated improvements in operating methods. Three major deficiencies had to be overcome: (1) The lack of permanent operator-technicians at our district headquarters stations; (2) confusion caused by too many stations on a single frequency; and (3) the fact that headquarters stations were located in the centres of population and consequently in areas of maximum man-made interference.

The first problem was overcome early in the year by appointment of permanent technician-operators to district headquarters at Vancouver, Kamloops, Nelson, and Prince George. These men are qualified technicians and take care of all overhaul and repair of equipment in their individual districts. They are responsible for the handling of traffic on their local network and the proper co-ordinating of same on the Provincial network.

The second deficiency, although not entirely overcome, was largely eliminated during 1946. Three new channels—3,392.5, 3,382.5, and 3,370 kilocycles—were obtained



on a temporary continuous basis and, it is hoped, will be permanently allotted to the Service or others awarded. Further plans in this direction include the placing of Prince Rupert headquarters station on its own frequency and the obtaining of an inter-district frequency for use of headquarters stations only in the Provincial network. This, it is hoped, will eventually be in the 5,000-kilocycle channel, but to date it has not been possible to secure award on this wave-length.

Some progress was made towards the solution of the noise-level problem, but considerably more work is indicated. Development of an RCR-HQ type of four-channel remote receiver was completed in Victoria during the late spring. Subsequently installation was made at Nelson District headquarters station at a previously chosen site just outside the city. Improvement in operation of the station was so marked that no comparison can be made with previous results.

In addition to the large four-channel remote receiver, single-frequency battery-operated remote receivers were also tried out at Salmo and Kettle Valley, in the Nelson District. In both cases there was very definite improvement in operation of the station, but some mechanical details were found to need improvement in this model, and this will be carried out before next season.

During the coming year it is proposed to install remote receivers at Kamloops, Vancouver, and Victoria headquarters stations. Tests have already been carried out and sites selected for these installations.

Although it was anticipated the supply situation would be relieved by the winter of 1946, this condition did not develop. Obtaining of repair and structural parts in Victoria has been more difficult than at any time since 1939. In addition, prices increased considerably, and no immediate let-up is in sight for the coming year. New PAC units ordered last spring were not received, and there is no indication when delivery may be expected.

We have not been able to put VHF sets to useful purpose in any general plan of operation. Our terrain is so rugged and the distance between stations such that sets of this type do not lend themselves to general usage. In addition, our operation practice is such that reliance must be placed on any of our stations to transmit in all directions for purpose of relay when conditions are difficult. There still remains, however, some possibility of using this type of set from lookout to Ranger station as an adjunct to, and not in place of, the medium-frequency set. This may be a partial solution to elimination of some stations from certain main schedules, thus allowing greater length of time on the air for more active stations.

Following are type and number of sets now in use by the Service: SPF sets, 204; PAC sets, 35; launch sets (50 watts), 10; launch sets (100 watts), 3; S-25 sets, 2; VHF sets, 2; headquarters receiver remote installations, 2; Ranger station remote receivers, 2; total, all types, 260. The majority of these units are operated only during the fire-season months. Operation during off-season period of the year comprises the Provincial headquarters stations network and individual district networks.

With the improvement in operation of the Provincial network, there has been a marked increase in interdistrict traffic. As an indication of this increase in traffic handled, Victoria station records show a total of 861 messages in 1944, 1,330 in 1945, and 2,558 in 1946. These figures do not include weather data and reports, which comprise many hundreds of additional messages during fire-season months.

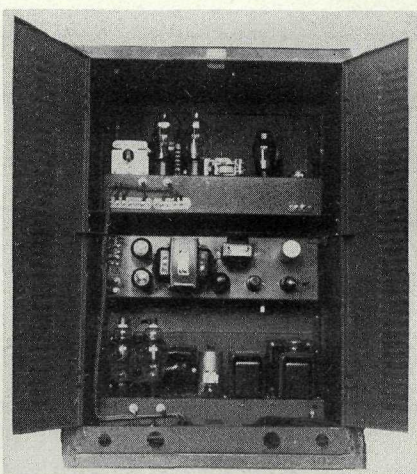
#### SLASH-DISPOSAL AND SNAG-FALLING.

Section 113A of the "Forest Act," enacted in 1937 and subsequently amended from time to time, was repealed in 1946 and a revised section 113A substituted. Although final objectives remain the same, the new section 113A defines more clearly the intent of the legislation and the general obligation of operators in meeting its requirements. Subsection (4) is probably the most outstanding revision in so far as the logging

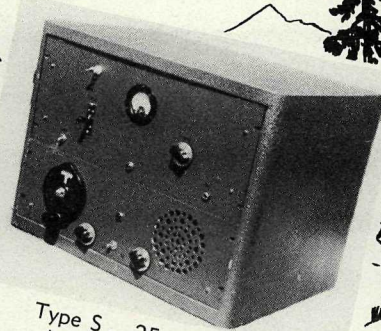


TYPES OF FOREST SERVICE.

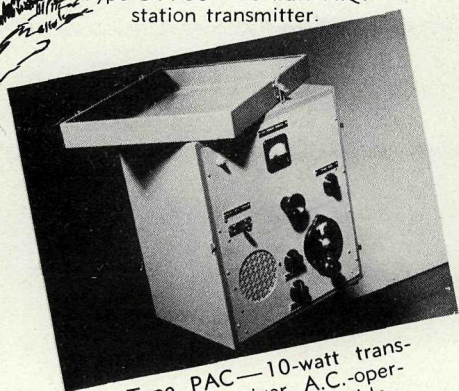
## *Radio Transmitter-Receivers.*



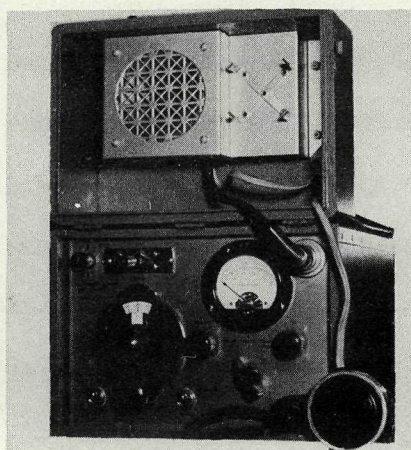
Type S . . 50—50-watt H.Q.  
station transmitter.



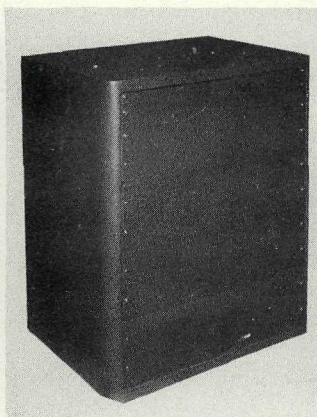
Type S . . 25—25-watt  
transmitter-receiver.



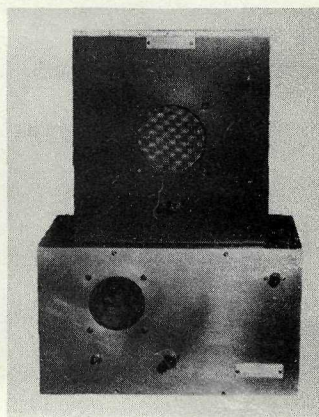
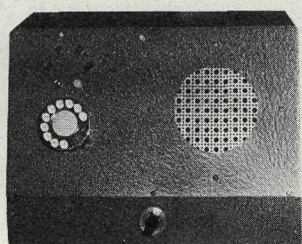
Type PAC—10-watt trans-  
mitter-receiver, A.C.-oper-  
ated and semi-portable.



Type SPF—2-watt portable  
transmitter-receiver, battery-  
operated. Weight 21 lb. with  
portable batteries.

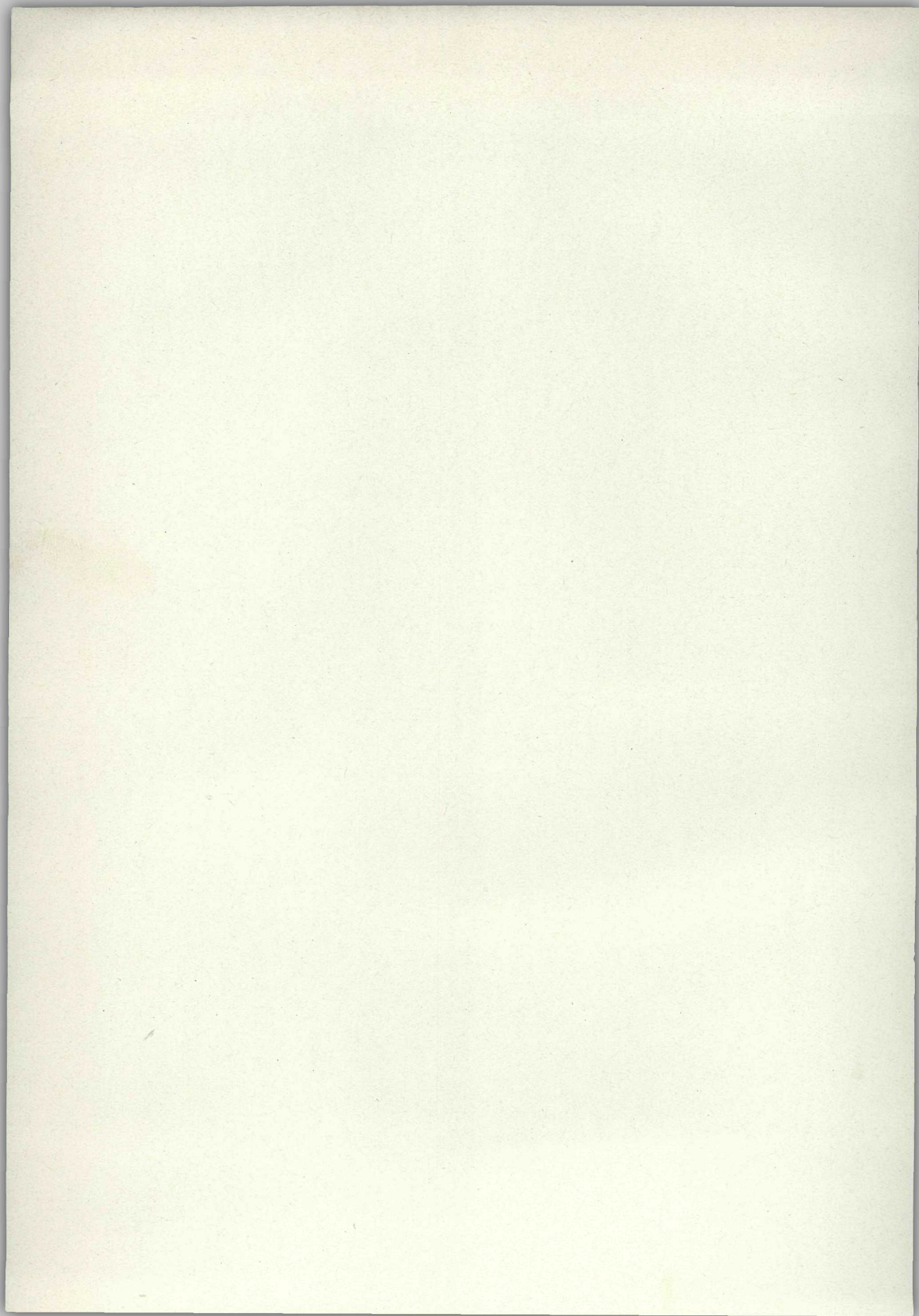


Type RCR . . HQ—Four-channel remote-control receiver.



Type RCR . . SPF—Single-  
channel battery-operated  
remote-control receiver,  
experimental model.







operator is concerned, in that it relieves him from slash-burning until such time as he is definitely instructed so to do by the Deputy Minister or any officer of the Forest Service authorized by the Deputy Minister to give such instruction. The introduction of subsections (7) and (8), defining slash- and snag-disposal as separate obligations and providing for compensation accordingly, was a most desirable change and has been favourably commented upon by the logging industry. Other changes made have assisted materially in general administration of this section of the Act.

The personnel of the Slash-disposal Division in the Vancouver Forest District was increased by the addition of two slash-disposal officers. This work is now being carried on by four experienced officials, and their efforts account largely for the improvement in slash-disposal practice.

In respect to total acreage burned, results achieved in slash-disposal in 1946 were not up to expectations. This situation does not result from lack of interest or co-operation on the part of the logging industry but rather to uncontrollable conditions, such as adverse weather and labour disputes.

In regard to weather, the year did not present average conditions, in that occurrence of favourable burning periods, during which safe and satisfactory burning could be practised, failed to materialize.

Spring burning was washed out by a wet and cold winter condition prolonged into May. This prevented conducting spring burning planned by many operations and, to some extent, interfered with the planned progress of logging and fall slash-disposal. In respect to spring slash-burning, it is of interest to note an increasing number of operators undertaking the disposal of slash in this period. This practice has merit, provided operators are willing to accept the additional risk and costs involved in obtaining satisfactory burns.

Fall burning, while successfully conducted in some regions, must, considering the district as a whole, be classified as unsatisfactory. Unfavourable weather occurring in September was the chief factor causing this condition. Insufficient moisture up to September 12th made broadcast burning prior to this date very risky, while subsequent to that date, particularly in the Campbell River-Courtenay and Alberni areas, drying periods were not of sufficient duration to allow a really satisfactory burning condition to build up in slash.

The labour situation and voluntary operation closures during hazardous weather were also contributing factors affecting slash-disposal in 1946. A loggers' strike extending from May 15th to June 20th interrupted the planned progress of logging and, as a result, many operations subsequently behind in their logging schedule were prevented from burning.

However, very noticeable improvement in preparation for, and in the actual conduct of, slash-disposal was evident during the year. Operators were more inclined towards undertaking the work of slash-disposal in line with approved practice and gave more consideration to the protection of residual and marginal timber values than in the past. "Goop," an incendiary developed during the recent war, was experimented with by some logging operators. The results obtained were as a general rule below expectations and placed the material in a class little better than Diesel oil for the purpose of igniting slash or forcing or spreading fire.

The provisions of the new section 113A which require the falling of snags concurrently with logging were carried out in a most satisfactory manner. This new requirement has assisted materially in obtaining the desired results on small operations and has also noticeably lessened the work involved in administration. At the year-end the majority of operators had fulfilled their obligation 100 per cent., outstanding snag-disposal being confined generally to immediately current logging.

In brief recapitulation a total of 57,424 acres of forest land was logged during 1946 in the portion of the Vancouver Forest District to which section 113A applies. Of



this acreage, a total of 31,941 acres was examined and officially reported on. The balance of 25,483 acres represents areas logged subsequent to September 1st and for slash-disposal requirements will be dealt with in 1947.

Compensation for failure to comply with the provisions of the section 113A in respect to 1945 and prior slash was levied during the year as follows:—

Cause.	Number of Operations.	Acreage.
Failure to dispose of slash.....	33	4,415.95
Failure to dispose of slash and fall snags.....	15	1,610.50
Failure to fall snags.....	22	1,748.40
Totals.....	70	7,774.85

Detailed statistics on all slash-disposal for the year 1946 appear in tabular form on pages 91-93 of this report. It will be of interest to note the marked reduction in damage resulting from slash-burning. This, it is believed, is partially the result of favourable weather conditions and, to a greater extent, to insistence of district officers on observance of recognized practices in actual conduct of disposal.

### PREVENTION.

On the Coast, in the Vancouver Forest District, no general closure was necessary during the year. However, the major portion of the Sayward Forest was closed to travel, except under permit, for the period July 1st to mid-September. Extensive plantations, naturally reforested areas, and major timber values in this forest warranted this special precaution. Control was effected by patrolmen stationed on the highways at point of entrance and exit to the forest. Stopping of all cars permitted counselling caution in use of fire and smoking, and also allowed distribution of a specially prepared combination map of the area and pamphlet appealing for co-operation in forest protection.

In the Nelson Forest District sixteen regional travel closures were invoked for an average duration of about three weeks during the most serious hazard period. These closures all covered individual watersheds where values existing warranted closure form of prevention.

In the Kamloops Forest District only one area in the Tulameen region was closed to travel, primarily for watershed protection.

No closures were invoked in the Prince Rupert or Fort George Districts.

Following in tabular form is detail of all 1946 closures:—

Area.	District.	Effective Date.	Date suspended.
Sayward Forest.....	Vancouver.....	June 25	Sept. 13
Bear Creek.....	Kamloops.....	July 25	Sept. 17
Sand Creek.....	Nelson.....	Aug. 2	Sept. 4
Sheep Creek.....	Nelson.....	Aug. 13	Sept. 4
Erie Creek.....	Nelson.....	Aug. 13	Sept. 4
Lamb Creek.....	Nelson.....	Aug. 13	Sept. 4
Upper Kootenay River.....	Nelson.....	Aug. 13	Sept. 4
Hidden Creek.....	Nelson.....	Aug. 13	Sept. 4
Anderson and Five Mile Creeks.....	Nelson.....	Aug. 13	Sept. 4
Porcupine Creek.....	Nelson.....	Aug. 13	Sept. 4
Duhamel and Upper Lemon Creeks.....	Nelson.....	Aug. 13	Sept. 4
Tiger, Cambridge, Gorge, and Casino Creeks.....	Nelson.....	Aug. 13	Sept. 4
South Fork of Salmon River and Lost Creek.....	Nelson.....	Aug. 13	Sept. 4
Blueberry, Poupore, Sullivan, Murphy, McNally, Hanna, and Topping Creeks.....	Nelson.....	Aug. 13	Sept. 4
Granby River.....	Nelson.....	Aug. 13	Sept. 4
Crawford Creek.....	Nelson.....	Aug. 13	Sept. 4
St. Mary River.....	Nelson.....	Aug. 13	Sept. 4
Pend d'Oreille River.....	Nelson.....	Aug. 13	Sept. 4



Other prevention-work undertaken during the season throughout the Province generally included timely prevention messages by press and radio, addresses to service clubs and schools, participation in local fairs by means of forest-protection exhibits, and posting of the usual highway and other fire-prevention signs. Routine inspection of operations for required fire-fighting equipment and fire safety measures were carried out as usual.

#### CO-OPERATION—OTHER AGENCIES.

Again we must express appreciation and thanks for very timely and valuable co-operation received throughout the season from the United States Forest Service in detection and patrolling of fires adjacent to the Border.

Valuable co-operation was also received throughout the year from press and radio in timely articles and announcements. Some business concerns made the forest-protection message part of their advertising, and it is worthy of note that one sporting-goods merchant in the Kamloops District, who conducts a weekly broadcast of news of primary interest to sportsmen, concluded each programme with a summary of existing forest-fire hazard conditions and appropriate warning with respect to care with fire in the woods. Co-operation of this nature is most valuable and very much appreciated.

The R.C.A.F. again assisted greatly in the Coastal region in providing detection flights, particularly in the Vancouver Forest District during hazardous fire-weather conditions. Pilots are keen and most co-operative, and this assistance meets a most pressing need and is without doubt the means of considerable saving in suppression costs.

As usual, excellent co-operation was also received from the numerous honorary fire wardens and fire-prevention officers active during the season in all districts. These men, who voluntarily assume their duties year after year, fill a key position in the protection picture in their various individual communities.

#### FIRE LAW ENFORCEMENT.

It was necessary to lay information in thirty-nine cases during the year over the whole Province. This is slightly above the ten-year average but is not considered an alarming situation in the light of population increase and expansion in forest industry. Of the total prosecutions, conviction was obtained in all but two instances. Again it must be reported that the greater proportion of prosecutions involved burning without permit and clearly indicates that public education in regard to governing regulations in this connection must be concentrated upon next year. It is worthy of note that no case involving contravening a forest closure was recorded during the year.



### FOREST RANGER SCHOOL.

Fulfilling a long-felt need of the Service, a Ranger School was established in 1945 and put into operation during the past year. The necessary staff appointments were made in April, 1945, and the preliminary work of selecting a site for the school commenced shortly thereafter. Due to labour and material shortages, it was necessary to locate buildings which would accommodate the school without too much remodelling, and it was finally decided that the former relief and Alternative Service Workers' camp at the Green Timbers Forestry Station could be adapted for temporary quarters, pending construction of suitable permanent buildings on the station. The work of remodelling the camp for school purposes, and preparing and arranging various courses of study, occupied the staff of two during the remainder of 1945, but the school was ready to open by the first week of January, 1946.

On January 7th, 1946, the Green Timbers Ranger School was formally opened by the Honourable Minister of Lands and Forests, Mr. E. T. Kenney, in a short but impressive ceremony in the lecture-hall. Twenty students, selected from the Ranger and Assistant Ranger staffs of all five forest districts of the Province, were in attendance. Included in the group were two Rangers, ten Acting Rangers, and eight Assistant Rangers.

The first three-month term was largely devoted to forest protection and included lectures as follows:—

	Hours.
1. Part XI. of the "Forest Act" and Operation Manual .....	40
2. Weather factors influencing fire-control and forest inflammability .....	13
3. Fire occurrence, behaviour, and reports .....	6
4. Public relations and fire law enforcement .....	24
5. Preliminary fire organization .....	24
6. Fire suppression .....	18
7. Construction and maintenance of improvements .....	24
8. Mechanical equipment .....	44
9. Office methods and maps .....	18
10. Arithmetic review, simple trigonometry, logarithms .....	44
11. Calculation of traverses .....	10
12. Forest pathology .....	9
13. Forest entomology .....	12
14. Botany .....	36
15. General aspects of forestry .....	12

Both Departmental and outside assistance was obtained by the regular school staff in the presentation of the above-outlined courses in order to give the students the advantages of instruction from specialists in the various technical subjects. In this connection, grateful acknowledgment is made for the lectures on meteorology delivered by Mr. P. Brun of the Dominion Meteorological Service; for the course in forest pathology given by Dr. J. E. Bier and his staff of the Division of Plant Pathology, Dominion Department of Agriculture; and for the course in forest entomology given by Mr. H. Richmond and his staff of the Division of Forest Entomology, Dominion Department of Agriculture.

During the spring term an evening course in first aid was arranged in co-operation with the St. John Ambulance Society, which sent out an instructor one night per week during the term to give instruction in this important subject. All of the students received certificates at the completion of the course.

The second term, or fall term, opened Monday, September 16th, and the following three months were devoted to forest management, except for the completion of the



course in fire suppression, continued from the spring term. Courses of study were as follows:—

	Hours.
1. Fire suppression (continued) .....	15
2. Methods of surveying, survey instruments .....	82
3. Forest mensuration (cruising, volume tables, etc.) .....	88
4. Forest management, "Forest Act," Management Manual .....	100
5. Scaling .....	40
6. Stumpage appraisals, forest valuations .....	47
7. Silvics and the practice of silviculture in British Columbia .....	60

After completion of the regular spring term a short course in meteorology, weather factors influencing fire-control, forest inflammability, fire occurrence and behaviour, preliminary fire organization, and fire suppression was conducted in co-operation with the industry. This course was open to company foremen, fire wardens, fire bosses, and others nominated by the logging companies interested. This was in response to various requests from the logging industry for such a course. Thirteen men, representing nine of the major logging companies, took advantage of the offer and attended an eight-day session commencing April 15th. Favourable comments on the value of the course have since been received and, if there is a call for it, similar classes will be held in future years.

During the year selection was made of a permanent school-site, approximating 6 acres, situated in Plots 24 and 25 of the Green Timbers Forestry Station, a short distance east of the Nichol Road and back of the main nursery beds. This area is on fairly high ground and can be made an attractive setting, as seen from the Pacific or trans-continental highway, for the school buildings. The area has been cleared and a contract has been let for the construction of gravelled access roads to all proposed building locations, including necessary court space. This contract also includes the gravelling of that part of the Nichol Road giving access from the Pacific Highway, which is being opened up by the District of Surrey at our request. Work under the contract was commenced in the fall but had to be suspended due to wet weather.



## PUBLIC RELATIONS AND EDUCATION.

Normal activities were maintained by the Division during the year under survey, as enumerated in detail below:—

*Newspapers.*—Forest-protection advertisements were inserted in ten daily, thirty-five weekly, and eight other publications. In so far as the daily and weekly papers were concerned, the advertisements comprised a series of three designs, the copy and ideas for the advertisements being the work of this Division and the art-work being done by the staff of the Government Printing Bureau. Special advertisements were designed for the remaining publications. The appreciation of the Division is due to the press for space in many publications which was freely devoted to editorials and other items in aid of forest protection.

*Radio.*—The radio networks co-operated, as in previous years, with time devoted to forest-fire hazard announcements and news items. This assistance is of immense value and is gratefully acknowledged.

*Motion Pictures.*—During the year, sixty-one of the seventy-five films comprising the Forest Service film library were used more extensively than ever before. Forest Service films were shown to 371 different audiences, totalling 32,633 persons. This brings our cumulative total recorded for 1945-46 to 49,180. The three most widely circulated films were: "Exploring Tweedsmuir Park," shown fifty-one times to 3,089 persons; "Land of Timber," shown thirty-six times to 2,583 persons; and "Garibaldi Park," shown thirty times to 2,478 persons.

The largest single audience recorded during the year was 1,200 persons at the Bay Street Armouries, Victoria, B.C., who saw "Forest Farming," "Jack Frost," and "Snow Thrills" on November 15th.

*Forest Service Calendar.*—The 1947 calendar was produced during the year in the customary format. The greatest quantity ever printed was secured, but demand, as usual, exceeded supply.

*"Forest and Outdoors."*—A total of 658 honorary fire wardens was appointed, and each one provided with a year's complimentary subscription to the Canadian forest conservation magazine, "Forest and Outdoors." A letter of thanks for his co-operation and interest was forwarded to each appointee over the signature of the Minister.

*Publications and Printed Material.*—Two technical publications were edited during the year, in assistance to the Operations and Economics Divisions respectively. A series of forest-protection bulletins, ten in number, was also edited on behalf of the Operations Division. Printing arrangements in connection with these and a number of minor projects was also undertaken. The Annual Report for 1945 was edited and printing supervised.

*Public Meetings.*—The staff of the Division addressed several gatherings on forestry topics and represented the Service at a number of Fish and Game Club meetings. In some cases talks were supplemented by showing motion pictures from the Forest Service film library.

*Library.*—The work of mounting index prints on individual cards was completed. The acquisition of additional book-case space and an index-drawer stand enabled a neater arrangement of this phase of Division work. A tabular statement of library operations appears on page 100.

*Posters and Signs.*—Two new fire-protection posters were designed and printed, and one sample of the new style "Scotchlite" road-sign secured for the consideration of Service officers.

*Exhibits.*—Preliminary plans for exhibits at district agricultural fairs during 1947 were instituted, and it is anticipated two exhibits will be available for circulation in 1947.



*Staff.*—An assistant to the Forester in charge was appointed in the last quarter of the year.

It is evident, however, that the Division should have closer contact with the district offices, and this can best be obtained by the appointment of individuals in each district specifically assigned to public relations work.



## GRAZING.

### GENERAL CONDITIONS.

The generally prosperous condition of the live-stock industry over the past several years continued during 1946. Prices remained steady at high levels and, on the whole, range and hay-crops were good. The rancher, of course, was beset with many of the difficulties common to all businesses during the current period of reconversion, as well as with some problems peculiar to ranching alone. A noteworthy attitude of progress is present among ranchers in general, and they are becoming much alive to the need for improvements in their methods of production and for co-operative effort. An example of this is the successful representations made by the ranchers for the establishment of a range experimental station in the vicinity of Kamloops.

The winter of 1945-46 was distinguished by extremely heavy snowfall throughout most range areas. This condition was followed by plentiful rains over most areas during May and June and occasional showers during the balance of the summer season. The only exceptions to these favourable conditions were in the Chilcotin area and in the Quesnel district. As a result, stock came out of the feed-yards in the spring in fair shape, considering the long feeding period, and, once on the range, all classes picked up rapidly in flesh and came in this past fall in excellent condition. Sheep came off the alpine ranges in good shape. Except on non-irrigated land around Williams Lake and in the Chilcotin, hay-crops were fair to good. Haying conditions were excellent from a weather standpoint, and high-quality feed was put up.

Ranchers report that, in the main, the labour situation is somewhat easier than it has been for several years. The quality continues poor, as experienced help is hard to get. Sheepmen report that it is all but impossible to get men, experienced or otherwise, to act as herders.

After being at plague proportions for several years, the grasshoppers did not cause any considerable damage during 1946. This is probably due to a parasite which is afflicting the hoppers. Extensive oiling and poisoning was also carried out in certain areas.

In some parts of the Interior the encroachment of certain undesirable weeds on the range has become noticeable—so much so that in some districts they have practically excluded all grasses.

### MARKETS AND PRICES.

With cattle prices remaining steady at high levels, good returns were assured to live-stock producers. Due to diversion of Prairie beef to Eastern markets the Vancouver market was able to absorb the usual heavy offerings of stock in October and November without prices being depressed to any extent. The successful efforts of the B.C. Live-stock Producers' Co-operative Association to spread offerings of grass-finished beef over as long a period as possible also acted as a stabilizing influence. Some 53,497 head of cattle and 33,976 sheep and lambs were shipped in 1946. The 1946 wool-clip ran to 277,339 lb., a slight decrease from the 1945 figure. Prices for good steers in Vancouver ran from a low of \$11.87 in January to \$12.73 in July for an average of \$12.25, an increase of 63 cents per hundredweight over 1945. Lamb prices averaged \$13.31 per hundredweight, an increase of 70 cents over 1945. Wool prices remained steady at an average of about 26¾ cents per pound.

There were seven major live-stock sales during 1946. At Quesnel the annual sale totalled 1,306 head, or double the number sold in 1945. The Twenty-eighth Annual Provincial Bull Sale, held at Kamloops, sold 129 bulls, the top price for a Hereford bull being \$3,000. The Interior Stockmen's Association sale broke all records, 1,147 cattle being sold. The annual ram sale held at Kamloops disposed of 79 rams, and the annual



Cariboo bull sale and fat-stock show and sale held in Kamloops in December grossed \$39,254, as compared with \$34,930 in 1945. At this sale the boys' and girls' entries accounted for 44 per cent. of all sales. At Elko, in the East Kootenay, the annual sale was held by the Waldo Stock Breeders' Association.

#### LIVE-STOCK LOSSES.

As might be expected in a good grass-year, losses from poisonous weeds were relatively light. Depredations by wolves and bears are reported to have increased very considerably again this year. In the Cariboo District the situation is particularly serious, and in the Okanagan bears are reported to be responsible for numerous killings on the range. Coyotes are also very numerous and caused severe losses in lambs. Ranchers and farmers are appealing through the B.C. Federation of Agriculture for higher bounties on all predators. There have been no severe losses due to animal diseases during the year.

#### RANGE RECONNAISSANCE.

Detailed information of topographical features, grass types, improvements, water, and forest-cover must be secured in the field by examination and plotted on base maps to permit of satisfactory range plans being set up. During 1946 we were able to increase our staff of technically trained men having the qualifications necessary to undertake such studies. Two intensive surveys were undertaken, covering a total of 407,680 acres. In the Clinton area some 338,880 acres were covered between the Cariboo Highway and the Fraser River, and 68,800 acres in the Anarchist Mountain area were also mapped. In addition to the value of the above surveys in dealing with the immediate problems existing in the range areas concerned, they will form a valuable basis for future administration. Such reconnaissance information is essential to the sound management of Crown ranges. A large percentage of the current problems arising in range administration could have been avoided if proper information had been available earlier.

Further reconnaissance projects are planned for 1947, and it is proposed to carry out this work as funds will allow until all our range areas are mapped.

#### CO-OPERATION.

Live-stock Associations continued to increase in number throughout the Province, and reflect the desire of the ranching industry to co-operate for their mutual benefit and in order to be able to deal as a unit with other industries and the Government. They are encouraged in order to give the Department a close contact with men using the range and to ensure a consensus of opinion on matters affecting all range-users. When incorporated, such associations are given official recognition and a voice in range management. In the Kamloops District sixty-one association meetings were held, fifty-four of which were attended by Forest Officers.

#### GRAZING PERMITS.

The number of grazing permits issued continues to increase, as more individuals find it necessary and desirable to make use of Crown ranges. The tabulation on page 100 shows the volume of business for 1946 and the past ten years.

#### COLLECTIONS.

Grazing fees are billed in the spring when the permit is issued, and accounts are sent out at that time. These accounts are paid as the rancher has the funds and is able to make payment. The fact that our outstanding arrears have been shrinking



materially over the past few years reflects the fact that permittees have more money, and accounts are paid more promptly.

#### RANGE IMPROVEMENT.

Scarcity of labour and materials again made it impossible to complete any large number of the many necessary improvements planned. These will be carried forward to 1947, and as much work accomplished along this line as conditions will allow. The most successful wild-horse disposal programme ever carried out in the Province took place during 1946. A total of 1,027 horses was shot, of which 306 were stallions and 658 mares. In addition, a considerable number of horses was rounded up and sold, both wild horses on Crown ranges and private stock running at large. This wild-horse disposal programme has made range available for some 5,000 head of cattle. This is a very important achievement in districts where range is at a premium. The programme is continuing throughout the winter of 1946-47 in both the Cariboo and the East Kootenay Districts, and it is expected that after this year the depredations of wild horses will have been materially reduced.

The disposal of wild horses and the construction of necessary improvements to the range, as well as proportionate cost of range reconnaissance, are paid from the Range Improvement Fund. This fund is set up through statutory contribution of one-third of all grazing fees collected. A statement of the status of the fund is found on page 88.



## PERSONNEL DIRECTORY, DECEMBER 31ST, 1946.

## VICTORIA OFFICE.

C. D. Orchard	Chief Forester	Victoria.
R. C. St. Clair	Assistant Chief Forester	Victoria.
E. W. Bassett	Forester—Operations	Victoria.
R. R. Douglas	Assistant Forester	Victoria.
J. R. Johnston	Assistant Forester	Victoria.
J. H. Blake	Marine and Structural Engineer	Victoria.
W. C. Spouse	Mechanical Superintendent	Victoria.
G. A. Playfair	Chief Radio Engineer	Victoria.
H. E. Ferguson	Radio Engineer	Victoria.
E. B. Prowd	Forester—Management	Victoria.
G. M. Abernethy	Assistant Forester	Victoria.
W. S. Hepher	Assistant Forester	Victoria.
F. S. McKinnon	Forester—Economics	Victoria.
J. L. Alexander	Forester	Victoria.
D. M. Carey	Assistant Forester	Victoria.
A. E. Collins	Assistant Forester	Victoria.
E. H. Garman	Assistant Forester	Victoria.
W. Hall	Assistant Forester	Victoria.
J. W. Ker	Assistant Forester	Victoria.
C. P. Lyons	Assistant Forester	Victoria.
H. M. Pogue	Assistant Forester	Victoria.
R. H. Spilsbury	Assistant Forester	Victoria.
R. C. Telford	Assistant Forester	Victoria.
A. Gordon	Technical Forest Assistant	Victoria.
A. C. Kinnear	Technical Forest Assistant	Victoria.
D. Macdougall	Technical Forest Assistant	Victoria.
G. Silburn	Technical Forest Assistant	Victoria.
D. M. Trew	Technical Forest Assistant	Victoria.
R. H. Boyd	Acting Forest Ranger	Victoria.
H. G. McWilliams	Forester—Reforestation	Victoria.
A. H. Bamford	Assistant Forester	Victoria.
E. G. Whiting	Supervisor	Victoria.
T. Wells	Superintendent, Green Timbers Nursery	New Westminster.
W. Turner	Superintendent, Campbell River Nursery	Campbell River.
J. R. Long	Superintendent, Duncan Nursery	Duncan.
Eric Druce	Forester—Public Relations	Victoria.
D. R. Monk	Technical Forest Assistant	Victoria.
R. D. Gregg	Forester—Ranger School	New Westminster.
J. A. Pedley	Assistant Forester	New Westminster.
J. G. MacDonald	Superintendent, Forest Service Marine Station	Vancouver.
S. W. Barclay	Royalty Inspector	Victoria.
H. H. Smith	Chief Accountant	Victoria.
R. G. Gilchrist	Chief Draughtsman	Victoria.

## DISTRICTS.

## Vancouver.

C. J. Haddon	District Forester	Vancouver.
K. C. McCannel	Assistant District Forester	Vancouver.
C. L. Armstrong	Assistant Forester	Vancouver.
G. R. W. Nixon	Assistant Forester	Vancouver.
D. B. Taylor	Assistant Forester	Vancouver.
W. Byers	Supervisor of Scalers	Vancouver.
A. C. Heard	Assistant Supervisor of Scalers	Vancouver.
A. H. Waddington	Fire Inspector (Slash)	Vancouver.
J. McNeil	Fire Inspector	Vancouver.
R. Murray	Supervisor	Vancouver.



*Vancouver—Continued.*

C. F. Holmes	Supervisor (Slash)	Vancouver.
G. G. Armytage	Forest Ranger	North Vancouver.
K. M. Bell	Forest Ranger	Pender Harbour.
W. Black	Forest Ranger	Powell River.
E. T. Calvert	Forest Ranger	Mission.
L. C. Chamberlin	Forest Ranger	Thurston Bay.
E. W. Cowie	Forest Ranger	Nanaimo.
C. S. Frampton	Forest Ranger	Lake Cowichan.
S. C. Frost	Forest Ranger	Squamish.
R. J. Glassford	Forest Ranger	Qualicum.
J. P. Greenhouse	Forest Ranger	Langford.
A. C. C. Langstroth	Forest Ranger	Alert Bay.
R. Little	Forest Ranger	Harrison Hot Springs.
J. A. Mahood	Forest Ranger	Chilliwack.
S. Silke	Forest Ranger	Courtenay.
H. Stevenson	Forest Ranger	Alberni.
P. E. Sweatman	Forest Ranger	Duncan.
T. J. W. Underwood	Forest Ranger	Campbell River.
C. M. Yingling	Forest Ranger	Lund.
R. W. Aylett	Acting Forest Ranger	Sechelt.
W. E. Jansen	Acting Forest Ranger	Port Hardy.
J. H. Robinson	Acting Forest Ranger	Thurston Bay.
E. P. Fox	Chief Clerk	Vancouver.

*Prince Rupert.*

J. E. Mathieson	District Forester	Prince Rupert.
J. S. Stokes	Assistant District Forester	Prince Rupert.
M. O. Kullander	Assistant Forester	Prince Rupert.
S. G. Cooper	Forest Ranger	Terrace.
C. L. Gibson	Forest Ranger	Smithers.
I. Martin	Forest Ranger	Prince Rupert.
J. B. Scott	Forest Ranger	Masset.
L. G. Taft	Forest Ranger	Southbank.
H. W. Campbell	Acting Forest Ranger	Ocean Falls.
W. H. Campbell	Acting Forest Ranger	Hazelton.
S. T. Strimbold	Acting Forest Ranger	Burns Lake.
A. M. Davies	Chief Clerk	Prince Rupert.

*Fort George.*

R. G. McKee	District Forester	Prince George.
L. F. Swannell	Assistant District Forester	Prince George.
A. H. Dixon	Assistant Forester	Prince George.
W. G. Henning	Fire Inspector	Prince George.
A. H. McCabe	Acting Supervisor of Scalpers	Prince George.
W. N. Campbell	Forest Ranger	Prince George.
G. A. Forbes	Forest Ranger	Prince George.
J. S. Macalister	Forest Ranger	McBride.
L. A. Willington	Forest Ranger	Penny.
C. L. French	Acting Forest Ranger	Fort St. John.
I. B. Johnson	Acting Forest Ranger	Pouce Coupe.
A. J. Kirk	Acting Forest Ranger	Fort Fraser.
W. V. McCabe	Acting Forest Ranger	Giscome.
A. V. O'Meara	Acting Forest Ranger	Vanderhoof.
R. B. Carter	Chief Clerk	Prince George.



*Kamloops.*

A. E. Parlow	District Forester	Kamloops.
H. B. Forse	Assistant District Forester	Kamloops.
L. B. B. Boutton	Assistant Forester	Kamloops.
I. T. Cameron	Assistant Forester	Kamloops.
H. K. DeBeck	Assistant Forester	Kamloops.
J. E. Milroy	Assistant Forester	Kamloops.
W. C. Pendray	Assistant Forester	Kamloops.
E. W. Robinson	Assistant Forester	Kamloops.
C. B. W. Rogers	Assistant Forester	Kamloops.
W. P. MacDonald	Fire Inspector	Kamloops.
E. A. Charlesworth	Supervisor of Scalers	Kamloops.
J. Boydell	Forest Ranger	Salmon Arm.
R. B. W. Eden	Forest Ranger	Kelowna.
H. A. Ferguson	Forest Ranger	Chase.
J. M. Fraser	Forest Ranger	Merritt.
C. D. S. Haddon	Forest Ranger	Revelstoke.
J. W. Hayhurst	Forest Ranger	Vernon.
M. A. Johnson	Forest Ranger	Blue River.
J. W. McCluskey	Forest Ranger	Vernon.
C. Perrin	Forest Ranger	Penticton.
C. E. Robertson	Forest Ranger	Clinton.
W. W. Stevens	Forest Ranger	Kamloops.
J. H. Templeman	Forest Ranger	Enderby.
C. Williams	Forest Ranger	Kamloops.
W. P. Cowan	Acting Forest Ranger	Clearwater.
J. H. Dearing	Acting Forest Ranger	Princeton.
T. L. Gibbs	Acting Forest Ranger	Alexis Creek.
R. C. Hewlett	Acting Forest Ranger	Birch Island.
H. G. Mayson	Acting Forest Ranger	Barriere.
F. H. Nelson	Acting Forest Ranger	Williams Lake.
J. A. Sim	Acting Forest Ranger	Sicamous.
H. J. Parker	Chief Clerk	Kamloops.

*Nelson.*

S. E. Marling	District Forester	Nelson.
M. W. Gormely	Assistant District Forester	Nelson.
C. D. Grove-White	Assistant Forester	Nelson.
L. S. Hope	Assistant Forester	Nelson.
G. W. Minns	Assistant Forester	Nelson.
W. C. Phillips	Assistant Forester	Nelson.
D. H. Ross	Fire Inspector	Nelson.
P. Young	Fire Inspector	Nelson.
T. W. Brewer	Supervisor	Nelson.
G. T. Schupe	Supervisor of Scalers	Nelson.
J. H. A. Applewhaite	Forest Ranger	Creston.
H. T. Barbour	Forest Ranger	Cranbrook.
L. A. Chase	Forest Ranger	New Denver.
H. J. Coles	Forest Ranger	Golden.
R. Damstrom	Forest Ranger	Fernie.
W. D. Haggart	Forest Ranger	Edgewood.
J. H. Holmberg	Forest Ranger	Grand Forks.
J. L. Johnson	Forest Ranger	Invermere.
J. F. Killough	Forest Ranger	Kettle Valley.
C. J. McGuire	Forest Ranger	Canal Flats.
H. C. Nichols	Forest Ranger	Rossland.
G. C. Palethorpe	Forest Ranger	Nelson.
G. T. Robinson	Forest Ranger	Kaslo.
R. O. Christie	Acting Forest Ranger	Arrowhead.
H. L. Couling	Acting Forest Ranger	Nakusp.
S. S. Simpson	Chief Clerk	Nelson.







---

---

## APPENDIX

---

---



---

## APPENDIX

---



## TABULATED DETAILED STATEMENTS TO SUPPLEMENT REPORT OF FOREST SERVICE.

### CONTENTS.

TABLE No.	GENERAL.	PAGE.
1. Distribution of Personnel, 1946.....		59
	REFORESTATION.	
2. Summary of Planting during the Years 1937-46.....		60
	FOREST MANAGEMENT.	
3. Estimated Value of Production, including Loading and Freight within the Province.....		61
4. Paper Production (in Tons).....		61
5. Water-borne Lumber Trade (in M.B.M.).....		62
6. Total Amount of Timber scaled in British Columbia during the Years 1945-46 (in F.B.M.).....		63
7. Species cut, all Products (in F.B.M.).....		64
8. Total Scale (in F.B.M.) segregated, showing Land Status, all Products, 1946.....		65
9. Timber scaled in British Columbia in 1946 (by Months and Districts).....		66
10. Logging Inspection, 1946.....		68
11. Trespasses, 1946.....		69
12. Pre-emption Inspection, 1946.....		69
13. Areas examined for Miscellaneous Purposes of the "Land Act," 1946.....		70
14. Classification of Areas examined, 1946.....		70
15. Areas cruised for Timber-sales, 1946.....		71
16. Timber-sale Record, 1946.....		71
17. Timber-sales awarded by Districts, 1946.....		72
18. Average Stumpage Prices as bid per M.B.F. Log-scale, by Species and Forest Districts, on Saw-timber cruised on Timber-sales in 1946.....		73
19. Average Stumpage Prices received per M.B.F. Log-scale, by Species and Forest Districts, on Saw-timber scaled from Timber-sales in 1946.....		74
20. Timber cut from Timber-sales during 1946.....		75
21. Saw and Shingle Mills of the Province, 1946.....		76
22. Export of Logs (in F.B.M.), 1946.....		77
23. Shipments of Poles, Piling, Mine-props, Fence-posts, Railway-ties, etc., 1946.....		78
24. Summary for Province, 1946.....		79
25. Timber-marks issued.....		79
26. Forest Service Draughting Office, 1946.....		80
27. Forest Insect Survey, 1946.....		80
	FOREST FINANCE.	
28. Crown-granted Timber Lands paying Forest Protection Tax.....		81
29. Extent and Assessed Value of Timber Land by Assessment Districts.....		81
30. Average Assessed Values of Crown-granted Timber Lands paying Forest Protection Tax, as compiled from Taxation Records.....		82
31. Forest Revenue.....		83



TABLE NO.	PAGE.
32. Amounts charged against Logging Operations, 1946.....	84
33. Amounts charged against Logging Operations, Fiscal Year 1945-46.....	85
34. Forest Revenue, Fiscal Year 1945-46.....	86
35. Forest Expenditure, Fiscal Year 1945-46.....	87
36. Scaling Fund.....	87
37. Forest Reserve Account.....	88
38. Grazing Range Improvement Fund.....	88
39. Standing of Forest Protection Fund, March 31st, 1946.....	89
40. Forest Protection Expenditure for Twelve Months ended March 31st, 1946—By the Forest Service.....	90
41. Forest Protection Expenditure for Twelve Months ended December 31st, 1946—Reported Approximate Expenditure by Other Agencies.....	91

## FOREST PROTECTION.

42. Summary of Acreage logged, 1946, and dealt with under Section 113A.....	91
43. Summary of 1946 Operations, Vancouver Forest District.....	92
44. Summary Chart A—Intentional Slash-burn.....	93
45. Recapitulation Slash-disposal, 1934-46.....	93
46. Fire Occurrences by Months, 1946.....	93
47. Number and Causes of Forest Fires, 1946.....	94
48. Number and Causes of Forest Fires for the Last Ten Years.....	94
49. Fires classified by Size and Damage, 1946.....	94
50. Damage to Property other than Forests, 1946.....	95
51. Damage to Forest-cover caused by Forest Fires, 1946.....	95
52. Fire Causes, Forest Service Cost, and Total Damage, 1946.....	96
53. Comparison of Damage caused by Forest Fires in Last Ten Years.....	97
54. Fires classified by Forest District, Place of Origin, and Cost per Fire of Fire-fighting, 1946.....	97
55. Prosecutions, 1946.....	98
56. Burning Permits, 1946.....	99

## PUBLIC RELATIONS.

57. Forest Service Library.....	100
---------------------------------	-----

## GRAZING.

58. Grazing Permits issued.....	100
59. Grazing Fees billed and collected.....	100



(1)

## DISTRIBUTION OF PERSONNEL, 1946.

Personnel.	FOREST DISTRICT.						
	Van-couver.	Prince Rupert.	Fort George.	Kam-loops.	Nelson.	Vic-toria.	Total.
<i>Permanent.</i>							
Chief Forester, Assistant Chief Forester, and Division Foresters.....	....	....	....	....	....	8	8
District Foresters and Assistant District Foresters.....	2	2	2	2	2	....	10
Foresters and Assistant Foresters.....	3	1	1	7	5	16	33
Supervisor of Rangers and Fire Inspectors.....	4	....	1	1	2	....	8
Rangers.....	{ 22	8	9	20	15	....	74
Supervisor of Scalers and Assistants.....	{ 2	....	1	1	1	....	5
Scalers.....	{ 34	....	....	....	....	....	34
Inspectors, Royalty and Export.....	{ 1	....	....	....	....	1	2
Mechanical—Radio and Engineering Supervisor.....	{ 1	....	....	....	....	1*	1*
Surveys and Research Assistant.....	{ 1	....	....	....	....	4	4
Nursery Superintendents.....	{ 1	....	....	....	....	5	5
Nursery, reforestation, and parks.....	{ 1	....	....	....	....	8*	8*
Draughtsmen.....	{ 1	....	....	....	....	3	3
Clerks, stenographers, and messengers.....	{ 1*	....	....	....	....	15*	15*
Superintendents and foremen — Forest Service Marine Station.....	{ 37	1	1	2	1	6	12
Mechanics, carpenters, and technicians.....	{ 1*	....	....	....	1*	4*	6*
Launch crewmen.....	{ 37	9	9	10	13	50	128
Miscellaneous.....	{ 7*	2*	1*	1*	1*	10*	22*
Permanent.....	108	21	25	44	39	105	342
Temporary permanent.....	17*	5*	1*	4*	2*	39*	68*
Total, permanent personnel.....	125	26	26	48	41	144	410
<i>Seasonal.</i>							
Assistant Rangers.....	28	10	13	26	35	....	112
Patrolmen.....	16	10	8	25	12	....	71
Lookout-men.....	15	9	12	17	29	....	82
Dispatchers and radio operators.....	16	5	3	13	16	....	53
Fire-suppression crewmen.....	42	8	....	48	40	....	138
Cruisers and compass-men.....	....	....	....	....	....	16	16
Miscellaneous.....	12	2	4	9	15	....	42
Total, seasonal personnel.....	129	44	40	138	147	16	514
Total, all personnel.....	254	70	66	186	188	160	924

Total number of positions, "permanent" and "temporary permanent," occupied December 31st, 1946, was 410.

\* Continuously employed but no voted salary for the purpose.



## SUMMARY OF PLANTING FOR LAST TEN YEARS.

(2)

Year.	EXPERIMENTAL.		FOREST SERVICE ON CROWN LAND.		PRIVATE COMPANIES.		COMMUNITY FORESTS.		PRIVATE PLANTING AND FARM WOOD-LOTS.		TOTAL.	
	Trees in Thousands.	Acres.	Trees in Thousands.	Acres.	Trees in Thousands.	Acres.	Trees in Thousands.	Acres.	Trees in Thousands.	Acres.	Trees in Thousands.	Acres.
1946.....	.....	.....	3,670.2	6,000.0	3,854.2	4,700.0	.....	.....	6.7	7.0	7,531.1	10,707.0
1945.....	.....	.....	160.0	180.0	1,035.0	1,215.0	.....	.....	8.4	10.0	1,203.4	1,405.0
1944.....	68.0	70.0	7,108.2	9,175.0	600.0	914.0	102.0	132.0	11.4	11.0	7,889.6	10,302.0
1943.....	22.4	25.0	8,535.0	10,804.0	556.9	510.0	70.5	70.0	12.4	12.0	9,197.2	11,421.0
1942.....	5.3	5.0	6,673.8	7,908.0	.....	.....	2.5	3.0	12.5	12.0	6,694.1	7,928.0
1941.....	7.3	7.0	8,267.7	10,188.0	460.0	550.0	15.0	15.0	2.2	2.0	8,752.2	10,762.0
1940.....	6.1	6.0	1,156.7	1,293.0	118.0	135.0	67.0	55.0	8.1	8.0	1,355.9	1,497.0
1939.....	72.6	28.6	816.8	948.0	99.4	116.0	5.0	5.0	20.8	20.0	1,014.3	1,117.6
1938.....	3.6	4.0	60.4	57.0	86.0	100.0	12.0	12.0	.....	.....	162.3	173.0
1937.....	9.5	9.8	.....	.....	.....	.....	.....	.....	.....	.....	9.5	9.8
Previously planted.....	515.2	462.3	306.4	652.0	22.8	36.3	25.0	25.0	.....	.....	869.4	1,175.6
Totals to date.....	710.0	617.7	36,755.2	47,205.0	6,832.3	8,276.3	299.0	317.0	82.5	82.0	44,679.0	56,498.0



(3) ESTIMATED VALUE OF PRODUCTION, INCLUDING LOADING AND FREIGHT WITHIN THE PROVINCE.

Product.	1939.	1940.	1941.	1942.	1943.	1944.	1945.	1946.	Ten-year Average, 1937-46.
Lumber.....	\$50,379,000	\$55,514,000	\$64,596,000	\$67,150,000	\$66,520,000	\$81,495,000	\$78,244,000	\$87,013,502	\$62,784,550
Pulp and paper.....	16,191,000	22,971,000	27,723,000	27,457,000	25,597,000	30,391,000	33,782,000	41,800,555	25,419,256
Shingles.....	8,560,000	9,620,000	11,550,000	12,822,000	8,332,000	10,006,000	10,544,000	12,946,506	9,813,051
Boxes.....	2,039,000	4,779,000	4,707,000	5,397,000	4,697,000	7,218,000	7,855,000	8,288,491	4,906,649
Doors.....	737,000	740,000	*	*	*	*	*	*	580,100
Plywood.....	.....	.....	.....	.....	.....	6,100,000	6,000,000	9,120,000	2,122,000
Piles, poles, and mine-props.....	1,556,000	1,759,000	1,723,000	2,576,000	2,387,000	2,088,000	2,986,000	5,125,762	2,416,176
Cordwood, fence-posts and lagging.....	1,495,000	1,399,000	1,522,000	2,165,000	4,485,000	3,303,000	2,621,000	2,647,488	2,255,149
Ties, railway.....	360,000	258,000	204,000	221,000	268,000	484,000	507,000	478,519	390,052
Additional value contributed by the wood-using industry.....	1,500,000	1,600,000	2,000,000	2,500,000	2,300,000	1,600,000	1,500,000	1,700,000	1,810,000
Laths and other miscellaneous products.....	1,400,000	1,400,000	1,500,000	1,500,000	1,400,000	1,500,000	1,500,000	1,400,000	1,430,000
Logs exported.....	3,852,000	2,684,000	4,212,000	2,618,000	1,555,000	2,065,000	1,766,000	2,349,280	2,812,128
Pulp-wood exported.....	11,000	8,000	7,000	2,000	16,000	35,000	25,000	6,787	11,579
Christmas trees.....	141,000	72,000	176,000	162,000	227,000	236,000	271,000	402,056	168,705
Cascara bark.....	.....	.....	.....	150,000	150,000	90,000	54,000	192,421	63,642
Totals.....	\$88,221,000	\$102,804,000	\$119,920,000	\$124,720,000	\$118,434,000	\$146,611,000	\$147,655,000	\$173,471,370	\$116,983,037

\* Included in wood-using industry value.

(4) PAPER PRODUCTION (IN TONS).

Product.	1940.	1941.	1942.	1943.	1944.	1945.	1946.	Ten-year Average, 1937-46.
Newsprint.....	262,144	275,788	252,559	211,696	236,696	253,671	259,921	241,279
Other papers.....	68,428	75,453	74,915	63,026	74,038	80,691	82,833	66,263

In addition to 317,014 tons of pulp manufactured into paper in the Province, 169,494 tons were shipped out of the Province during the year.



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

(5)

Destination.	1937.	1938.	1939.	1940.	1941.	1942.	1943.	1944.	1945.	1946.	Ten-year Average, 1937-46.
Australia.....	158,400	141,465	144,534	72,797	49,614	13,819	45,452	55,332	68,600	67,269	81,728
New Zealand.....	5,415	7,805	5,142	2,584	2,517	2,199	.....	3,150	5,637	5,892	4,034
South America.....	10,632	9,946	5,560	1,795	28,091	4,244	2,433	.....	.....	11,794	7,450
China.....	47,635	43,457	34,775	6,347	9,663	.....	.....	.....	229	58,632	20,074
Japan.....	30,677	9,194	6,116	835	.....	.....	.....	.....	.....	.....	4,683
United Kingdom and Continent.....	648,364	741,631	964,693	971,594	479,861	466,902	653,847	618,517	595,473	418,960	655,984
South Africa.....	49,015	41,614	80,120	84,708	68,142	20,878	24,924	44,214	46,732	95,588	55,593
India and Straits Settlements.....	2,781	1,174	7,225	139	2,292	846	.....	50	51	161	1,472
United States and Atlantic Coast.....	107,933	154,038	123,735†	70,725†	68,383†	6,368†	3,301†	†	9,587†	2,905	54,697
Philippine and Hawaiian Islands.....	743	1,780	862	.....	.....	.....	83	.....	.....	1,084	455
West Indies and Cuba.....	9,487	13,584	12,828	15,309	19,056	4,633	3,930	8,240	10,412	16,832	11,436
South Sea Islands.....	12,904	5,745	11,523	7,187	5,074	5,080	1,402	5,350	2,370	3,565	6,018
Mexico and Central America.....	3,748	2,271	2,024	5	2,975	229	.....	.....	4	5,812	1,707
Egypt, Palestine, and Arabia.....	8,279	5,315	1,828	17,326	88	146	237	1,278	1,241	19,185	5,492
*Belgium.....	4,578	5,468	1,976	.....	.....	.....	.....	.....	2,243	897	1,517
*Denmark.....	29	.....	210	120	.....	.....	.....	.....	.....	420	78
*France.....	875	653	592	4,938	.....	.....	.....	.....	2,109	16,229	2,540
*Germany.....	2,836	3,383	3,090	.....	.....	.....	.....	.....	.....	.....	931
*Holland.....	1,669	3,332	1,098	.....	.....	.....	.....	.....	.....	17,387	2,348
*Italy.....	1,023	73	703	686	.....	.....	.....	581	313	.....	337
*Norway and Sweden.....	113	41	5	.....	.....	.....	.....	.....	.....	.....	16
Spain.....	.....	.....	3	.....	.....	.....	.....	.....	.....	.....	1
Foreign, unclassified.....	241	226	402†	821†	279†	29†	250†	2,086†	2,031†	2,603	896
Totals.....	1,107,377	1,192,195	1,409,042	1,257,917	736,035	525,403	735,859	738,798	747,032	745,215	919,487

\* Previously included with United Kingdom.

† Includes a considerable volume with destination unknown due to cloaking of war shipments.



TOTAL AMOUNT OF TIMBER SCALED IN BRITISH COLUMBIA DURING THE YEARS 1945-46  
(6) (IN F.B.M.).

Forest District.	1945.	1946.	Gain.	Loss.	Net Gain.
Vancouver.....	2,292,502,255	2,394,825,986	102,323,731	.....	.....
Prince Rupert.....	190,476,922	124,855,987	.....	65,620,935	.....
Totals, Coast.....	2,482,979,177	2,519,681,973	.....	.....	.....
Prince Rupert.....	54,115,835	62,580,526	8,464,691	.....	.....
Fort George.....	145,480,381	184,613,649	39,133,268	.....	.....
Kamloops.....	178,895,616	201,613,808	22,718,192	.....	.....
Nelson.....	219,764,482	225,175,176	5,410,694	.....	.....
Totals, Interior.....	598,256,314	673,983,159	75,726,845	.....	.....
Grand totals.....	3,081,235,491	3,193,665,132	178,050,576	65,620,935	112,429,641



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

(7)

Forest District.	Fir.	Cedar.	Spruce.	Lodge- pole Pine.	Hemlock.	Balsam.	White Pine.	Yellow Pine.	Cypress.	Larch.	Hard- woods.	Cotton- wood.	Totals.
Vancouver.....	1,054,785,807	524,622,025	39,868,656	.....	585,182,792	150,331,425	18,251,827	38,862	2,498,189	.....	13,236,627	6,009,776	2,394,825,986
Prince Rupert.....	5,617,225	17,549,833	57,155,208	119,136	31,612,012	11,459,652	.....	.....	21,325	.....	73,900	1,167,696	124,855,987
Totals, Coast.....	1,060,403,032	542,171,858	97,023,864	199,136	616,794,804	161,791,077	18,251,827	38,862	2,519,514	.....	13,310,527	7,177,472	2,519,681,973
Prince Rupert.....	583,658	6,108,763	31,937,042	15,824,176	6,056,005	1,087,375	.....	.....	.....	.....	235,947	747,560	62,580,526
Fort George.....	18,275,140	2,342,932	117,680,246	41,048,511	463	3,616,730	.....	.....	.....	.....	82,812	1,566,815	184,613,649
Kamloops.....	100,735,132	22,717,258	17,724,967	11,001,660	1,029,423	853,312	2,849,408	21,030,986	.....	21,057,951	350,939	2,262,772	201,613,808
Nelson.....	55,385,880	41,226,734	25,819,307	6,060,219	11,335,936	1,249,251	5,700,025	12,790,608	.....	64,785,613	90,477	731,126	225,175,176
Totals, Interior.....	174,979,810	72,395,687	193,161,562	73,934,566	18,421,827	6,806,668	8,549,433	33,821,594	.....	85,843,564	760,175	5,308,273	673,983,159
Grand totals, 1946..	1,235,382,842	614,567,545	290,185,426	74,133,702	635,216,631	168,597,745	26,801,260	33,860,456	2,519,514	85,843,564	14,070,702	12,485,745	3,193,665,132



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

	FOREST DISTRICT.						Totals, 1946.
	Vancouver.	Prince Rupert, Coast.	Prince Rupert, Interior.	Fort George.	Kamloops.	Nelson.	
Timber licences.....	563,862,187	12,950,960	631,458	5,836,832	5,601,788	14,464,299	603,347,524
Timber berths.....	147,066,961	.....	.....	.....	10,571,316	3,092,499	160,730,776
Timber leases.....	190,426,292	.....	.....	.....	.....	132,857	190,559,149
Pulp leases.....	31,614,858	5,175,696	.....	.....	.....	.....	36,790,554
Pulp licences.....	42,555,595	3,604,177	.....	.....	.....	.....	46,159,772
Hand-loggers' licences.....	29,462	483,953	.....	.....	.....	.....	513,415
Dominion lands.....	23,741,297	20,367,189	72,708	.....	1,709,997	5,336,627	51,227,818
Timber sales.....	384,068,163	56,520,519	51,216,652	133,594,739	123,337,618	133,686,237	882,423,928
Pulp-timber sales.....	3,427,394	15,298,942	.....	.....	.....	.....	18,726,336
Pre-emptions, S.R., and miscellaneous.....	16,873,212	644,614	1,085,885	19,352,183	4,272,470	10,133,258	52,361,622
Crown grants—							
To 1887.....	835,022,894	1,238	.....	233,609	16,470,105	1,310,109	853,037,955
1887-1906.....	93,426,066	1,900,647	272,514	106,500	5,009,804	27,995,516	128,711,047
1906-1914.....	20,538,844	5,362,426	3,845,761	3,896,764	15,190,576	14,099,882	62,934,253
1914 to date.....	42,172,761	2,545,626	5,455,548	21,593,022	19,450,134	14,923,892	106,140,983
Totals.....	2,394,825,986	124,855,987	62,580,526	184,613,649	201,613,808	225,175,176	3,193,665,132

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

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



(9) TIMBER SCALED IN BRITISH COLUMBIA IN 1946 (BY MONTHS AND DISTRICTS).

Month.	Vancouver.	Prince Rupert, Coast.	Prince Rupert, Interior.	Fort George.	Kamloops.	Nelson.	Total F.B.M.	Total Lineal Feet.	Total Cord.	Total Hewn Ties.	Total Cubic Feet.
January	134,475,171 F.B.M. lineal ft.	4,933,695 23,867 cords	4,324,972 386,302 200 hewn ties	10,073,114 436,532 282 cubic ft.	12,438,809 773,146 1,877 26,778 5,029	9,697,110 370,549 10,093 26,784	175,882,871	2,275,237	14,468	83,550	
February	160,907,610 F.B.M. lineal ft.	428,362 4,501 cords	3,172,531 646,696 76 11,648	13,742,075 533,105 1,231 43,477	9,447,870 2,774,856 3,654 3,183	10,772,619 1,627,673 3,639 4,711	198,471,067	6,008,925	11,210	65,783	
March	213,115,551 F.B.M. lineal ft.	95,438 640,061 2,996 5,835	4,287,544 180,530 233 313	14,207,355 319,766 465 5,399	9,981,564 1,136,191 5,857 3,817	11,942,960 1,320,406 4,072 5,126	253,630,412	3,596,954	13,623	20,490	
April	248,447,397 F.B.M. lineal ft.	5,955,386 1,091,855 3,210 hewn ties	3,663,230 155,367 122 7,622	15,493,361 1,432,479 145 947	8,354,701 824,375 5,079 797	9,532,955 765,044 2,773 4,160	291,447,030	4,269,120	11,329	13,526	
May	181,125,886 F.B.M. lineal ft.	8,514,228 540,097 1,846 2,856	2,666,422 101,004 54 8,497	14,140,109 513,638 703 12,284	9,871,736 1,503,032 2,574 10,494	12,108,156 1,424,275 5,259 7,968	228,426,537	4,082,046	10,511	42,099	
June	70,360,428 F.B.M. lineal ft.	13,129,580 2,250,470 3,627 2,658	2,829,303 304,783 384 7,637	6,012,880 886,219 1,647 1,022	6,397,090 523,072 3,415 15,675	5,708,994 1,217,702 3,897 2,694	104,438,275	5,205,101	12,970	29,686	
July	211,610,974 F.B.M. lineal ft.	12,310,826 1,022,703 4,928 905	3,229,320 808,548 191 15,082	4,230,616 4,042,696 978 5,254	14,346,504 845,474 2,824 3,294	10,848,607 1,667,007 10,119 23,172	256,576,847	8,407,258	19,040	47,707	
August	256,985,998 F.B.M. lineal ft.	15,784,890 744,118 4,214	4,708,282 1,467,791 182 2,060	14,347,810 822,615 262	20,382,869 1,873,690 1,383 8,234	17,965,069 887,893 2,602 906	330,674,858	5,808,656	8,854	11,200	







(10)

## LOGGING INSPECTION, 1946.

Forest District.	TYPE OF TENURE OPERATED.				No. of Inspections.
	Timber-sales.	Hand-loggers' Licences.	Leases, Licences, Crown Grants, and Pre-emptions.	Totals.	
Vancouver.....	877	1	1,311	2,189	4,307
Prince Rupert.....	513	5	142	660	2,312
Fort George.....	552	....	105	657	882
Kamloops.....	921	....	618	1,539	3,236
Nelson.....	764	....	845	1,609	2,237
Totals, 1946.....	3,627	6	3,021	6,654	12,974
Totals, 1945.....	3,492	9	2,852	6,353	11,901
Totals, 1944.....	3,373	4	2,540	5,917	11,648
Totals, 1943.....	3,259	11	2,519	5,789	12,110
Totals, 1942.....	3,086	18	2,569	5,673	13,753
Totals, 1941.....	3,207	18	2,833	6,058	11,438
Totals, 1940.....	2,864	12	2,272	5,148	10,968
Totals, 1939.....	2,770	10	2,068	4,848	11,295
Totals, 1938.....	2,674	23	1,804	4,501	10,828
Totals, 1937.....	2,404	46	1,932	4,382	11,507
Ten-year average, 1937-46.....	3,075	16	2,441	5,532	11,842



(11)

## TRESPASSES, 1946.

Forest District.	No. of Cases.	Areas cut over (Acres).	QUANTITY CUT.							No. of Resulting Seizures.	Amount charged.
			Feet B.M.	Lineal Feet.	Cords.	Ties.	Christmas Trees.	Cedar Shakes.	Posts.		
Vancouver.....	52	193	2,832,177	73,266	245	.....	199	41,377	.....	....	\$10,453.01
Prince Rupert.....	21	37	567,384	79,213	680	.....	.....	.....	.....	....	1,755.52
Fort George.....	26	430	867,456	1,118,758	173	2,790	.....	.....	1,900	....	4,593.53
Kamloops.....	47	487	744,398	99,770	221	110	783	.....	.....	3	3,618.98
Nelson.....	80	1,421	2,072,928	389,567	150	.....	9,166	.....	34,097	5	7,109.59
Totals, 1946.....	226	2,568	7,084,343	1,760,574	1,469	2,900	10,148	41,377	35,997	8	\$27,530.63
Totals, 1945.....	267	3,313	24,322,556	516,960	1,910	9,902	2,438	.....	.....	10	\$37,877.12
Totals, 1944.....	210	2,467	12,817,066	179,219	3,369	4,231	3,781	.....	.....	5	\$29,193.16
Totals, 1943.....	167	3,058	9,744,957	129,409	6,873	552	7,923	.....	.....	7	\$23,725.29
Totals, 1942.....	180	1,159	4,413,906	365,861	4,757	490	1,512	.....	.....	15	\$14,391.61
Totals, 1941.....	236	1,788	7,627,990	526,391	2,887	1,365	4,150	.....	.....	17	\$24,253.10
Totals, 1940.....	194	877	5,206,829	94,444	1,573	4,279	9,854	.....	.....	13	\$14,088.24
Totals, 1939.....	209*	571	6,905,268	94,818	3,147	5,206	46,729	.....	.....	26	\$17,725.00
Totals, 1938.....	149	816	4,309,030	203,195	3,014	1,185	7,530	.....	.....	10	\$9,653.86
Totals, 1937.....	156	1,147	8,239,813	143,860	1,607	2,132	35,017	.....	.....	7	\$17,439.52
Ten-year aver- age, 1937-46.....	199	1,776	9,017,176	401,473	3,061	3,224	12,908	.....	.....	12	\$21,587.75

\* Christmas-tree cutting largely responsible for increase.

(12)

## PRE-EMPTION INSPECTION, 1946.

Forest District.	1946.	NUMBER EXAMINED.
		Ten-year Average, 1937-46.
Vancouver .....	58	200
Prince Rupert .....	36	121
Fort George .....	91	351
Kamloops .....	145	486
Nelson .....	48	110
Totals .....	378	1,268



AREAS EXAMINED FOR MISCELLANEOUS PURPOSES OF THE  
"LAND ACT," 1946.

(13)

Forest District.	Applications for Hay and Grazing Leases.		Applications for Pre-emption Records.		Applications to Purchase.		Miscellaneous.		Totals.	
	No.	Acres.	No.	Acres.	No.	Acres.	No.	Acres.	No.	Acres.
Vancouver.....	3	435	9	616	183	13,321	138	699	333	15,071
Prince Rupert.....	1	160	3	360	32	4,913	14	911	50	6,344
Fort George.....	8	1,065	11	1,544	48	4,543	4	103	71	7,255
Kamloops.....	54	22,705	18	2,374	111	8,156	16	674	199	33,909
Nelson.....	9	3,356	3	702	92	10,728	1	.....	105	14,786
Totals.....	75	27,721	44	5,596	466	41,661	173	2,387	758	77,365

(14)

CLASSIFICATION OF AREAS EXAMINED, 1946.

Forest District.	Total Area.	Agricultural Land.	Non-agricultural Land.	Merchantable Timber Land.	Estimated Timber on Merchantable Timber Land.
	Acres.	Acres.	Acres.	Acres.	M.B.M.
Vancouver.....	15,071	3,180	11,891	1,253	20,593
Prince Rupert.....	6,344	1,303	5,041	478	10,158
Fort George.....	7,255	2,618	4,637	430	4,345
Kamloops.....	33,909	2,589	31,320	434	4,855
Nelson.....	14,786	1,609	13,177	408	3,046
Totals.....	77,365	11,299	66,066	3,003	42,997



(15)

## AREAS CRUISED FOR TIMBER-SALES, 1946.

Forest District.	Number cruised.	Acreage.	Saw- timber (M.B.M.).	Pit Props, Poles, and Piles (Lineal Ft.).	Shingle- bolts and Cordwood (Cords).	Railway- ties (No.).	Car Stakes and Posts (No.).
Vancouver.....	577	87,414	510,390	698,893	18,431	10,400	559,300
Prince Rupert.....	321	45,916	126,706	3,933,533	13,324	55,998	18,900
Fort George.....	349	55,445	149,403	8,891,415	9,961	91,009	107,396
Kamloops.....	485	103,289	249,519	12,841,723	34,051	37,250	.....
Nelson.....	327	70,523	194,698	14,395,205	14,311	22,235	2,033,110
Totals, 1946.....	2,059	362,587	1,230,716	40,760,769	90,078	216,892	2,718,706
Totals, 1945.....	1,488	261,150	948,673	48,743,325	95,774	301,276	1,802,463
Totals, 1944.....	1,476	334,729	1,205,308	8,166,829	137,737	483,363	1,345,439
Totals, 1943.....	1,771	590,953	907,768	10,720,729	259,741	454,767	816,544
Totals, 1942.....	1,469	305,222	794,676	8,562,739	100,232	381,106	743,500
Totals, 1941.....	1,611	321,220	689,595	15,794,246	126,463	199,174	263,480
Totals, 1940.....	1,620	300,480	572,562	11,309,288	72,157	314,644	512,042
Totals, 1939.....	1,324	212,594	470,660	5,016,945	68,078	339,866	261,100
Totals, 1938.....	1,486	325,403	482,680	5,747,765	126,329	804,240	169,900
Totals, 1937.....	1,471	278,386	633,216	9,658,000	140,820	753,408	160,450
Ten-year average, 1937-46	1,578	329,272	793,585	16,448,064	121,741	424,874	879,363

(16)

## TIMBER-SALE RECORD, 1946.

District.	Sales made.	Sales closed.	Total Sales existing.	Total Area under Sale (Acres).	Area paying Forest Protec- tion Tax (Acres).	Total 10-per-cent. Deposit.
Vancouver.....	629	355	1,325	339,296	163,313	\$451,703.33
Prince Rupert.....	347	245	1,002	235,615	120,310	179,067.62
Fort George.....	319	191	655	164,949	60,820	93,942.81
Kamloops.....	541	381	1,533	369,475	220,201	183,143.43
Nelson.....	351	292	1,025	308,519	170,243	159,797.55
Province.....	2,187	1,464	5,540	1,417,854	734,887	\$1,067,654.74
Cash sales.....	440	.....	.....	.....	.....	.....
Total.....	2,627	.....	.....	.....	.....	.....



## TIMBER-SALES AWARDED BY DISTRICTS, 1946.

(17)

Forest District.	No. of Sales.	Acreage.	Saw-timber (F.B.M.).	Poles and Piling (Lin. Ft.).	No. of Posts.	No. of Cords.	No. of Ties.	No. of Christmas Trees.	No. of Hop-poles.	No. of Car-stakes.	No. of Blast-ing-sticks.	No. of Fence-rails.	No. of Beam-poles.	No. of Cedar Shakes.	Estimated Revenue.
Vancouver.....	651	149,405	608,937,000	500,825	24,700	23,715	7,000	.....	600	.....	.....	.....	.....	2,025,000	\$2,396,558.24
Prince Rupert.....	351	54,654	146,844,000	4,268,769	8,215	6,156	88,884	.....	.....	5,000	.....	.....	.....	.....	474,444.01
Nelson.....	382	82,209	147,850,000	19,739,280	2,457,430	15,609	24,030	.....	.....	.....	.....	.....	.....	.....	635,353.92
Fort George.....	479	50,128	157,346,000	14,020,436	266,633	9,351	103,125	.....	.....	.....	.....	.....	.....	47,726	636,867.45
Kamloops.....	774	107,109	201,971,000	16,931,994	225,465	32,491	43,299	.....	.....	350	.....	.....	1,000	.....	842,925.04
Totals, 1946.....	2,637	443,505	1,262,948,000	55,461,304	2,982,443	87,322	266,338	.....	600	5,350	.....	.....	1,000	2,072,726	\$5,036,148.66
Totals, 1945.....	1,898	330,190	949,614,000	39,645,792	2,325,117	76,221	255,242	.....	2,500	2,450	.....	.....	.....	.....	\$3,475,676.91
Totals, 1944.....	1,893	345,132	855,787,000	6,866,301	1,665,783	93,058	381,571	.....	.....	620	60,000	.....	10,000	.....	\$2,879,952.84
Totals, 1943.....	2,016*	394,981	888,580,000	10,875,063	943,827	214,317	336,251	.....	20,000	3,970	150,000	1,000	.....	.....	\$3,064,953.20
Totals, 1942.....	1,710	363,193	751,591,000	11,944,558	746,345	100,312	299,905	.....	.....	4,420	.....	.....	.....	.....	\$2,339,521.06
Totals, 1941.....	1,853	362,997	623,121,000	14,763,144	639,015	103,422	198,549	.....	2,500	5,300	.....	100	.....	.....	\$1,953,469.79
Totals, 1940.....	1,734	314,659	548,898,000	10,073,574	447,909	105,185	309,618	219,450	2,000	5,750	.....	940	.....	.....	\$1,599,106.33
Totals, 1939.....	1,520	355,958	442,776,000	4,931,607	499,130	104,778	370,673	217,965	3,500	7,200	50,000	.....	.....	.....	\$1,233,235.71
Totals, 1938.....	1,501	274,424	415,747,000	5,834,486	291,908	120,853	647,391	97,065	.....	.....	.....	.....	.....	.....	\$1,203,885.37
Totals, 1937.....	1,449	278,988	450,798,000	9,864,973	363,950	122,143	644,223	.....	.....	.....	.....	.....	.....	.....	\$1,271,475.20
Ten-year average, 1937-46.....	1,821	346,402	718,926,000	17,036,080	1,090,543	112,811	370,976	.....	.....	.....	.....	.....	.....	.....	\$2,405,742.51

\* Revised figures.



AVERAGE STUMPAGE PRICES AS BID PER M.B.F. LOG-SCALE, BY SPECIES AND FOREST DISTRICTS, ON SAW-TIMBER  
CRUISED ON TIMBER-SALES IN 1946.

(18)

Forest District.	DOUGLAS FIR.			CEDAR.			SPRUCE.			HEMLOCK.			BALSAM.		
	M.B.F.	Price per M.	Price Range per M.	M.B.F.	Price per M.	Price Range per M.	M.B.F.	Price per M.	Price Range per M.	M.B.F.	Price per M.	Price Range per M.	M.B.F.	Price per M.	Price Range per M.
Vancouver.....	257,310	\$2.97	\$1.00-6.70	146,999	\$3.02	\$0.50-6.75	10,855	\$2.19	\$1.50-3.80	156,581	\$1.73	\$0.50-6.50	54,436	\$1.73	\$0.50-5.25
Prince Rupert (Coast).....	6,063	1.93	1.25-2.50	8,749	1.76	.75-2.50	26,174	1.70	1.00-3.50	12,743	1.23	1.00-1.50	3,492	1.26	1.00-1.50
Prince Rupert (Interior).....	51	1.50	1.50	2,794	1.51	1.00-1.75	41,125	1.98	1.25-4.75	6,794	1.39	1.00-1.50	867	1.48	1.00-3.55
Fort George.....	20,111	2.02	1.25-3.55	.....	.....	.....	131,950	2.39	1.00-7.25	.....	.....	.....	835	1.58	1.00-2.45
Kamloops.....	130,869	1.96	1.00-6.00	2,324	1.81	1.00-3.00	18,154	3.21	1.25-4.75	832	1.48	1.00-2.25	342	1.50	1.25-2.80
Nelson.....	32,283	2.06	1.25-5.50	11,460	2.64	1.00-4.10	13,146	2.95	1.70-8.10	24,272	1.70	1.00-3.30	652	1.78	1.00-2.50
Totals for Province.....	446,687	\$2.55	.....	172,326	\$2.89	.....	241,404	\$2.33	.....	201,222	\$1.68	.....	60,624	\$1.70	.....
1945 figures.....	256,448	\$2.36	.....	152,451	\$2.76	.....	195,660	\$2.16	.....	156,515	\$1.57	.....	53,908	\$1.53	.....
Ten-year period, 1937-46	2,272,366	\$1.95	.....	1,040,238	\$2.15	.....	1,566,476	\$1.89	.....	1,009,683	\$1.23	.....	341,540	\$1.23	.....

Forest District.	WHITE PINE.			WESTERN YELLOW PINE.			LARCH (TAMARACK).			OTHER SPECIES.			ALL SPECIES.		
	M.B.F.	Price per M.	Price Range per M.	M.B.F.	Price per M.	Price Range per M.	M.B.F.	Price per M.	Price Range per M.	M.B.F.	Price per M.	Price Range per M.	M.B.F.	Price per M.	Price Range per M.
Vancouver.....	3,567	\$4.83	\$1.00-6.00	1,108	\$2.95	\$2.00-3.20	.....	.....	.....	3,365	\$2.41	\$1.50-4.00	634,221	\$2.56	.....
Prince Rupert (Coast).....	.....	.....	.....	.....	.....	.....	.....	.....	.....	630	1.62	1.00-2.00	57,851	1.60	.....
Prince Rupert (Interior).....	.....	.....	.....	.....	.....	.....	.....	.....	.....	12,903	1.92	1.25-4.90	64,534	1.88	.....
Fort George.....	6,870	5.34	2.50-7.00	30,565	2.80	1.75-8.00	9,024	\$1.87	.....	10,902	1.96	1.00-2.55	163,798	2.26	.....
Kamloops.....	8,074	5.01	3.50-7.50	5,101	2.94	1.70-7.50	34,630	2.16	\$1.50-3.00	3,017	1.21	1.00-3.00	201,997	2.29	.....
Nelson.....	.....	.....	.....	.....	.....	.....	.....	.....	1.25-5.50	2,435	1.97	1.85-1.99	132,053	2.46	.....
Totals for Province.....	18,511	\$5.10	.....	36,774	\$2.82	.....	43,654	\$2.10	.....	33,252	\$1.92	.....	1,254,454	\$2.39	.....
1945 figures.....	11,250	\$4.07	.....	19,224	\$2.13	.....	48,130	\$2.12	.....	25,083	\$1.93	.....	913,669	\$2.19	.....
Ten-year period, 1937-46	108,992	\$3.12	.....	221,464	\$1.89	.....	349,626	\$1.43	.....	164,779	\$1.64	.....	6,179,514	\$1.80	.....



AVERAGE STUMPAGE PRICES RECEIVED PER M.B.F. LOG-SCALE, BY SPECIES AND FOREST DISTRICTS, ON SAW-TIMBER  
SCALED FROM TIMBER-SALES IN 1946.

(19)

Forest District.	DOUGLAS FIR.		CEDAR.		SPRUCE.		HEMLOCK.		BALSAM.		WHITE PINE.		WESTERN YELLOW PINE.		LARCH (TAMARACK).		OTHER SPECIES.		ALL SPECIES.	
	M.B.F.	Price per M.	M.B.F.	Price per M.	M.B.F.	Price per M.	M.B.F.	Price per M.	M.B.F.	Price per M.	M.B.F.	Price per M.	M.B.F.	Price per M.	M.B.F.	Price per M.	M.B.F.	Price per M.	M.B.F.	Price per M.
Vancouver.....	157,777	\$2.65	100,712	\$3.00	6,392	\$2.52	84,441	\$1.67	24,874	\$1.64	2,181	\$3.98	47	\$2.33	.....	.....	3,148	\$2.88	379,572	\$2.47
Prince Rupert (Coast).....	196	1.58	12,557	1.50	32,762	1.57	20,798	1.20	4,533	1.23	.....	.....	.....	.....	.....	.....	587	1.42	71,433	1.43
Prince Rupert (Interior).....	584	1.58	550	1.39	26,153	1.74	5,345	1.17	1,053	1.45	.....	.....	.....	.....	.....	.....	5,605	1.84	39,290	1.66
Fort George.....	7,951	1.73	37	1.00	91,479	2.38	.....	.....	2,136	1.30	.....	.....	.....	.....	.....	.....	3,647	1.61	105,250	2.28
Kamloops.....	50,848	1.64	1,241	1.45	13,713	1.92	375	1.33	806	1.28	1,491	3.58	11,898	2.10	9,530	\$1.92	997	1.60	90,899	1.79
Nelson.....	27,566	1.69	6,137	1.37	14,312	2.06	7,631	1.56	683	1.52	2,752	4.22	4,678	2.06	40,857	1.75	1,180	1.60	105,796	1.82
Entire Province.....	244,922	\$2.30	121,234	\$2.74	184,811	\$2.09	118,590	\$1.56	34,085	\$1.55	6,424	\$3.99	16,623	\$2.09	50,387	\$1.78	15,164	\$1.95	792,240	\$2.15
1945 figures.....	211,472	\$2.21	97,122	\$2.51	166,681	\$2.12	98,736	\$1.45	28,314	\$1.44	6,331	\$3.17	19,049	\$2.06	49,087	\$1.56	13,593	\$1.86	690,389	\$2.04



## TIMBER CUT FROM TIMBER-SALES DURING 1946.

(20)

District.	Board-feet.	Lineal Feet.	Cords.	Ties.	Posts.	Christmas Trees.	Hop-and Bean-poles.	Stakes.	Car-stakes.	Stubs.	Blasting-sticks.	Anchor-blocks.	Shingle-shakes.
Vancouver.....	372,081,464	472,975	13,410.98	2,028	20,488	2,219	18,974	.....	14,418	.....	75,675	.....	1,763,193
Prince Rupert.....	115,138,018	3,983,207	1,812.91	110,469	6,744	.....	.....	.....	400	.....	.....	.....	.....
Fort George.....	116,710,928	13,977,925	6,443.70	107,021	115,314	1,068	.....	.....	.....	.....	.....	.....	447,726
Kamloops.....	92,627,970	6,453,116	29,308.33	83,746	138,708	213,741	45,000	.....	300	.....	.....	.....	.....
Nelson.....	95,604,738	10,967,297	5,147.58	58,332	1,414,814	7,684	.....	.....	100	.....	.....	100	.....
Totals, 1946.....	792,163,118	35,854,520	56,123.50	311,596	1,696,068	224,712	63,974	.....	15,218	.....	75,675	100	2,210,919
Totals, 1945.....	696,065,196	16,823,506	49,028.79	413,639	1,335,191	415,093	15,596	13,296	21,249	.....	.....	.....	5,763
Totals, 1944.....	643,497,149	8,354,765	79,080.74	435,862	1,356,253	368,410	39,124	363,880	1,989	373	.....	.....	6,000
Totals, 1943.....	526,361,074	8,881,017	80,313.62	288,140	594,164	341,277	250,342	.....	15,111	.....	36,125	.....	.....
Totals, 1942.....	499,861,024	9,169,501	43,891.18	189,953	461,231	322,153	96,335	.....	920	.....	.....	.....	.....
Totals, 1941.....	499,155,819	8,886,147	49,941.85	324,835	311,360	159,968	2,075	.....	2,850	.....	.....	1,900*	.....
Totals, 1940.....	478,965,174	8,262,287	52,642.99	274,918	259,089	295,022	1,000	.....	1,794	410	12,000	.....	.....
Totals, 1939.....	386,997,288	7,639,565	62,506.12	435,611	215,457	39,662	585	.....	681	.....	.....	.....	.....
Totals, 1938.....	334,981,454	8,223,100	57,340.70	648,646	175,306	58,354	.....	.....	.....	.....	.....	.....	.....
Totals, 1937.....	384,628,267	8,603,582	49,980.91	724,483	197,859	.....	.....	.....	.....	.....	.....	.....	.....
Ten-year average, 1937-46...	524,267,556	12,069,799	53,085.04	404,768	660,198	.....	.....	.....	.....	.....	.....	.....	.....

\* Rails.



(21)

## SAW AND SHINGLE MILLS OF THE PROVINCE, 1946.

Forest District.	OPERATING.				SHUT DOWN.			
	Sawmills.		Shingle-mills.		Sawmills.		Shingle-mills.	
	No.	Estimated Eight-hour Daily Capacity, M.B.M.	No.	Estimated Eight-hour Daily Capacity, Shingles, M.	No.	Estimated Eight-hour Daily Capacity, M.B.M.	No.	Estimated Eight-hour Daily Capacity, Shingles, M.
Vancouver.....	339	7,715	53	8,573	20	209	2	125
Prince Rupert.....	149	1,085	1	5	6	67	1	5
Fort George.....	210	2,097	.....	.....	55	250	.....	.....
Kamloops.....	321	2,000	2	28	17	94	2	.....
Nelson.....	209	2,359	3	50	17	121	3	35
Totals, 1946.....	1,228	15,256	59	8,656	115	741	8	165
Totals, 1945.....	931	13,590	51	7,054	137	808	7	150
Totals, 1944.....	807	14,974	51	6,695	110	702	16	581
Totals, 1943.....	614	13,623	54	7,411	120	646	19	829
Totals, 1942.....	551	13,197	70	8,874	149	1,206	11	135
Totals, 1941.....	557	13,820	76	8,835	129	1,083	5	63
Totals, 1940.....	542	12,691	77	8,585	141	1,432	18	307
Totals, 1939.....	461	11,698	84	7,926	147	1,907	24	537
Totals, 1938.....	481	12,159	88	8,184	126	1,406	19	315
Totals, 1937.....	434	11,042	80	9,124	131	1,685	16	402
Ten-year average, 1937-46.....	661	13,205	69	8,134	130	1,162	14	348



(22)

## EXPORT OF LOGS (IN F.B.M.), 1946.

Species.	Grade No. 1.	Grade No. 2.	Grade No. 3.	Ungraded.	Totals.
Fir.....	29,533	5,250,162	7,422,510	.....	12,702,205
Cedar.....	6,798,548	11,914,274	19,179,900	.....	37,892,722
Spruce.....	.....	6,688	1,552,457	.....	1,559,145
Lodgepole pine.....	.....	.....	72,000	.....	72,000
Hemlock.....	.....	.....	.....	28,446,805	28,446,805
Balsam.....	.....	.....	.....	5,452,121	5,452,121
White pine.....	13,994	291,286	24,492	.....	329,772
Cypress.....	971	13,126	53,358	.....	67,455
Hardwoods.....	.....	.....	1,317	.....	1,317
Cottonwood.....	.....	9,529	2,129	.....	11,658
Totals, 1946.....	6,843,046	17,485,065	28,308,163	33,898,926	86,535,200*
Totals, 1945.....	3,852,321	20,696,800	24,903,105	32,624,170	82,076,396
Totals, 1944.....	6,724,297	29,051,958	33,851,519	32,027,805	101,655,579
Totals, 1943.....	2,809,744	17,720,743	28,863,804	29,261,754	78,656,045
Totals, 1942.....	2,639,167	18,960,886	27,618,347	106,793,550	156,011,950
Totals, 1941.....	8,549,320	63,485,278	43,165,973	191,879,335	307,079,906
Totals, 1940.....	4,697,188	37,567,582	24,865,886	150,396,702	217,527,358
Totals, 1939.....	6,383,398	111,155,799	66,870,882	128,323,383	312,733,462
Totals, 1938.....	4,386,370	98,637,490	74,650,653	81,998,569	259,673,082
Totals, 1937.....	4,924,298	114,991,217	66,611,218	83,947,361	270,474,094
Ten-year average, 1937-46.....	5,180,915	52,975,282	41,970,955	87,115,155	187,242,307

\* Of this total, 82,008,715 F.B.M. were exported from Crown grants carrying the export privilege; 4,526,485 F.B.M. were exported under permit from other areas.



(23)

SHIPMENTS OF POLES, PILING, MINE-PROPS, FENCE-POSTS,  
RAILWAY-TIES, ETC., 1946.

Forest District.	Quantity exported.	Approximate Value, F.O.B.	WHERE MARKETED.		
			United States.	Canada.	Other Countries.
Vancouver—					
Poles .....lin. ft.	2,197,638	\$549,410.00	1,304,422	893,216	.....
Piles .....lin. ft.	1,836,591	459,148.00	1,565,953	262,348	8,290
Pulpwood .....cords	463	5,788.00	463	.....	.....
Stakes .....pieces	681,880	20,456.00	681,880	.....	.....
Fence-posts .....posts	19,910	3,982.00	13,653	6,257	.....
Mine-timbers .....lin. ft.	901,702	31,144.00	.....	.....	901,702
Mine-props .....cords	439	7,458.00	.....	.....	439
Christmas trees .....trees	102,842	15,426.00	102,842	.....	.....
Prince Rupert—					
Poles and piling .....lin. ft.	1,507,385	198,555.00	211,705	1,295,680	.....
Hewn railway-ties .....ties	.....	.....	.....	.....	.....
Fence-posts .....posts	4,678	1,170.00	.....	4,678	.....
Mine-timbers .....lin. ft.	3,710,323	74,206.00	.....	.....	3,710,323
Fort George—					
Poles .....lin. ft.	370,964	51,783.08	12,355	358,609	.....
Fence-posts .....cords	2,003	20,030.00	173	1,830	.....
Hewn railway-ties .....ties	113,139	92,980.60	.....	113,139	.....
Mine-props .....cords	24,909	430,433.57	.....	.....	24,909
Cordwood .....cords	16	64.00	.....	16	.....
Christmas trees .....trees	5,219	2,609.50	5,219	.....	.....
Kamloops—					
Poles and piling .....lin. ft.	7,788,645	1,164,371.35	4,380,960	3,407,685	.....
Hewn railway-ties .....ties	92,231	87,619.45	.....	92,231	.....
Fence-posts .....cords	2,716	63,830.55	20	2,696	.....
Stubs .....lin. ft.	28,390	2,839.00	.....	28,390	.....
Mine-timbers .....lin. ft.	7,021,987	326,452.57	.....	143,668	6,878,319
Christmas trees .....trees	884,864	154,557.85	884,864	.....	.....
Nelson—					
Poles .....lin. ft.	4,549,536	682,430.00	3,132,488	1,417,048	.....
Piles .....lin. ft.	45,379	7,261.00	4,631	40,748	.....
Mine-props .....cords	5,947	44,603.00	.....	5,947	.....
Fence-posts .....cords	27,977	335,724.00	19,321	8,656	.....
Cordwood .....cords	24	180.00	.....	24	.....
Sticks and stakes .....lin. ft.	255,000	1,275.00	255,000	97,364	.....
Hewn railway-ties .....ties	97,364	92,496.00	.....	.....	.....
Christmas trees .....trees	1,138,800	378,119.00	1,039,150	99,650	.....
British pit-props .....cords	21,919	383,583.00	.....	.....	21,919
Total value, 1946.....	.....	\$5,689,985.52	.....	.....	.....
Total value, 1945.....	.....	\$3,502,002.00	.....	.....	.....



(24)

## SUMMARY FOR PROVINCE, 1946.

Product.	Volume.	Value.	Per Cent. of Total Value.
Poles and piling.....lin. ft.	18,296,138	\$3,112,958.43	54.71
Hewn railway-ties.....ties	302,734	273,096.05	4.80
Cordwood.....cords	40	244.00	0.01
Pulp-wood.....cords	463	5,788.00	0.10
Fence-posts.....posts	24,588	5,152.00	0.09
Fence-posts.....cords	32,696	419,584.55	7.37
Mine-timbers.....lin. ft.	11,634,012	431,802.57	7.59
Mine-props.....cords	31,295	482,494.57	8.48
Stubs.....lin. ft.	28,390	2,839.00	0.05
Sticks and stakes.....lin. ft.	255,000	1,275.00	0.02
Stakes.....pieces	681,880	20,456.00	0.36
Christmas trees.....trees	2,131,725	550,712.35	9.68
British pit-props.....cords	21,919	383,583.00	6.74
Totals.....	.....	\$5,689,985.52	100.00

(25)

## TIMBER-MARKS ISSUED.

	1940.	1941.	1942.	1943.	1944.	1945.	1946.
Old Crown grants.....	272	211	160	190	280	329	631
Crown grants, 1887-1906.....	101	85	85	98	89	115	200
Crown grants, 1906-1914.....	99	101	92	104	81	106	176
Section 57, "Forest Act".....	275	282	250	283	234	337	473
Stumpage reservations.....	58	64	79	72	51	53	70
Pre-emptions under sections 28 and 29, "Land Act".....	1	1	2	2	1	2	3
Timber berths.....	16	16	9	5	9	3	8
Indian reserves.....	13	5	4	11	10	16	15
Timber-sales.....	1,724	1,853	1,709	2,017	1,893	1,898	2,637
Hand-loggers.....	4	11	19	9	8	6	.....
Special marks.....	3	6	6	5	6	15	35
Pulp leases.....	2	2	2	1	1	.....	.....
Pulp licences.....	20	17	1	4	1	2	.....
Totals.....	2,588	2,654	2,418	2,801	2,664	2,882	4,248
Transfers and changes of marks.....	315	307	224	237	251	327	486



(26)

## FOREST SERVICE DRAUGHTING OFFICE, 1946.

Month.	NUMBER OF DRAWINGS PREPARED OR TRACINGS MADE.						NUMBER OF BLUE-PRINTS OR DITTO-PRINTS MADE FROM DRAUGHTING OFFICE DRAWINGS.		
	Timber-sales.	Timber-marks.	Examina-tion Sketches.	Miscella-neous Matters.	Construc-tional Works, etc.	Totals.	Blue-prints.	Ditto-prints.	Totals.
January.....	83	132	52	190	3	460	514	1,065	1,579
February.....	53	135	60	59	8	315	565	465	1,030
March.....	68	156	68	20	6	318	935	670	1,605
April.....	42	217	95	18	4	376	883	445	1,328
May.....	60	200	117	18	2	397	957	620	1,577
June.....	44	191	118	8	1	362	845	345	1,190
July.....	45	192	120	18	3	378	914	360	1,274
August.....	71	133	61	68	11	344	721	770	1,491
September.....	39	191	110	18	....	358	825	525	1,350
October.....	28	146	89	32	3	298	782	570	1,352
November.....	33	113	83	38	5	272	656	710	1,366
December.....	38	125	55	38	2	258	516	755	1,271
Totals, 1946.....	604	1,931	1,028	525	48	4,136	9,113	7,300	16,413
Totals, 1945.....	569	1,193	693	684	75	3,214	6,495	6,701	13,196
Totals, 1944.....	442	889	459	544	46	2,380	4,159	4,983	9,142
Totals, 1943.....	356	937	396	293	93	2,075	4,009	3,448	7,457
Totals, 1942.....	329	868	359	111	73	1,740	†	†	†
Totals, 1941.....	247	1,087	468	150	70	2,022	†	†	†
Totals, 1940.....	224	1,151	434	282	*	2,091	†	†	†
Totals, 1939.....	231	943	408	269	*	1,851	†	†	†
Totals, 1938.....	268	1,023	340	316	*	1,947	†	†	†
Totals, 1937.....	258	1,202	394	436	*	2,290	†	†	†
Totals for ten-year period.....	3,528	11,224	4,979	3,610	405	23,746	23,776	22,432	46,208
Average for ten-year period.....	353	1,122	498	361	68†	2,375	5,944§	5,608§	11,552§

\* Prior to 1941, Constructional Works, etc., included in Miscellaneous Matters. † No record kept prior to 1943.

‡ Average for six-year period only. § Average for four-year period only.

(27)

## FOREST INSECT SURVEY, 1946.

Forest District.	Insect-box Collections made.	Negative Reports.
Vancouver .....	234	17
Prince Rupert .....	115	4
Fort George .....	73	7
Kamloops .....	93	7
Nelson .....	78	2
Totals .....	593	37



## (28) CROWN-GRANTED TIMBER LANDS PAYING FOREST PROTECTION TAX.

Year.	Area (Acres).	Average Assessed Value per Acre of Timber Land.
1921	845,111	\$10.33
1922	887,980	11.99
1923	883,344	11.62
1924	654,668	15.22
1925	654,016	40.61
1926	688,372	39.77
1927	690,438	39.01
1928	671,131	38.62
1929	644,011	38.41
1930	629,156	44.74
1931	602,086	43.77
1932	552,007	43.73
1933	567,731	41.18
1934	557,481	37.25
1935	535,918	37.13
1936	515,924	36.61
1937	743,109	23.32*
1938	754,348	23.05
1939	719,112	22.73
1940	549,250	27.70†
1941	543,632	26.99
1942	527,995	26.34
1943	543,044	25.15
1944	571,308	25.28
1945	591,082	26.32
1946	601,148	26.64‡

\* From 1937 forest protection tax has been charged on areas assessed as timber land in their entirety, in accordance with section 119 of the "Forest Act" and section 33 of the "Taxation Act"; previously the levy was on the timbered portion only.

† Approximately 155,000 acres assessed as timber land reverted to the Crown in 1939.

‡ That is, 169,456 acres logged-off land at \$2 per acre, and 431,692 acres timber at \$36.31 per acre.

(29)

## EXTENT AND ASSESSED VALUE OF TIMBER LAND BY ASSESSMENT DISTRICTS.

Assessment District.	Acreage, 1946.	Increase or Decrease over 1945.	Average Value per Acre.	Change in Assessed Value since 1945.
Alberni.....	79,624	-254	\$35.27	+\$0.81
Comox.....	122,730	+2,901	27.12	+4.64
Cowichan.....	101,457	+2,745	33.43	-6.78
Fort Steele.....	12,969	*	5.05	-.20
Galiano, Mayne, and Pender Islands.....	328	*	13.50	-3.79
Kettle River.....	315	*	10.37	*
Nanaimo.....	145,451	+4,986	29.93	+.42
Nelson.....	2,637	*	5.83	*
Omineca.....	160	*	4.15	*
Prince George.....	1,233	*	15.71	+.56
Prince Rupert.....	21,164	*	17.17	-.01
Revelstoke.....	33,203	*	10.57	*
Slocan.....	39,744	-1,280	2.60	+.04
Victoria.....	40,133	+968	30.00	+2.70
Totals.....	601,148	+10,066	\$26.64	.....

\* No change.



AVERAGE ASSESSED VALUES OF CROWN-GRANTED TIMBER LANDS PAYING FOREST PROTECTION TAX,  
AS COMPILED FROM TAXATION RECORDS.

(30)

Year.	Acreage Assessed as Timber Land.	Assessed Value of Timber Land, all Districts.	COAST.				INTERIOR.					
			Acres logged.	Assessed Value at \$1.75 per Acre.	Acres Timber.	Assessed Value of Timber Acreage.	Average Assessed Value per Acre.	Acres logged.	Assessed Value at \$1.75 per Acre.	Acres Timber.	Assessed Value of Timber Acreage.	Average Assessed Value per Acre.
1935.....	776,354	\$19,898,112	89,695	\$156,966	365,570	\$18,018,429	\$49.29	150,627	\$263,597	170,462	\$1,459,120	\$8.55
1936.....	766,186	18,608,333	92,892	162,561	352,582	16,794,942	47.64	152,846	267,480	167,866	1,383,350	8.20
1937*.....	766,413	17,876,510	96,598	169,047	363,693	16,186,893	44.50	153,566	268,741	152,556	1,251,829	8.20
1938*.....	756,328	17,392,573	106,833	186,957	344,858	15,725,673	45.60	157,508	275,639	147,129	1,204,304	8.18
1939.....	719,111	16,352,130	89,209	156,116	338,794	14,791,762	43.66	153,032	267,806	138,075	1,136,446	8.23
1940†.....	549,250	15,218,436	103,486	181,100	338,419	14,223,458	42.02	24,852	43,491	82,493	770,387	9.34
1941.....	543,633	14,671,235	105,541	184,697	335,468	13,704,195	40.85	26,016	45,528	76,608	736,815	9.62
1942.....	527,995	13,911,102	112,834	197,460	322,306	13,006,020	40.35	20,072	35,126	72,781	672,496	9.24
1943.....	543,044	13,662,320	125,313	219,296	325,996	12,749,123	39.18	20,205	35,359	71,529	658,542	9.20
1944.....	571,308	14,442,090	134,194	234,839	345,378	13,636,664	39.45	20,816	36,428	70,920	543,159	7.53
1945.....	591,082	15,560,066	142,504	249,382	357,037	14,748,624	41.38	21,536	37,688	70,005	524,372	7.48
1946.....	601,148	16,012,995	146,331	292,662†	364,556	15,161,847	41.59	23,125	46,250†	67,136	512,236	7.63

\* Revised returns.

† Decrease due to reversions.

‡ Assessed value at \$2 per acre.



## FOREST REVENUE.

(31)

	12 months to Dec. 31, 1946.	12 months to Dec. 31, 1945.	12 months to Dec. 31, 1944.	12 months to Dec. 31, 1943.	12 months to Dec. 31, 1942.	12 months to Dec. 31, 1941.	Ten-year Aver- age, 1937-46.
Timber-licence rentals.....	\$400,523.71	\$395,819.33	\$397,031.83	\$404,570.49	\$435,710.37	\$418,845.21	\$450,047.74
Timber-licence transfer fees.....	4,205.00	1,265.00	2,200.00	1,600.00	665.00	1,580.00	1,617.00
Timber-licence penalty fees.....	4,357.94	10,812.89	8,141.37	14,242.37	13,116.76	18,373.81	17,516.77
Hand-loggers' licence fees.....	75.00	150.00	175.00	250.00	525.00	225.00	345.00
Timber-lease rentals.....	51,079.41	50,326.77	55,511.92	47,397.15	50,342.12	51,194.41	54,459.48
Timber-lease penalty fees.....	60.73	9.28	29.63	89.56	94.71	83.36	246.63
Timber-sale rentals.....	62,881.12	61,643.16	44,268.30	53,468.33	36,661.13	26,157.94	39,437.80
Timber-sale stumpage.....	1,892,216.67	1,557,196.33	1,361,735.77	1,085,134.06	940,550.81	832,448.02	1,008,616.59
Timber-sale cruising.....	24,571.66	16,004.71	15,783.31	15,253.39	13,880.54	13,567.09	13,774.74
Timber-sale advertising.....	5,297.25	3,723.25	3,224.00	2,758.40	2,352.50	2,208.00	2,547.84
Timber royalty and tax.....	2,193,637.87	1,999,997.71	2,006,184.27	1,825,020.05	2,141,077.41	2,514,780.43	2,028,048.43
Scaling fees (not Scaling Fund).....	.....	.....	.....	47.85	384.99	369.35	252.74
Scaling expenses (not Scaling Fund).....	1,161.05	1,504.34	3,426.51	2,907.05	794.48	246.13	1,102.05
Trespass stumpage.....	43,405.37	48,168.41	34,933.49	35,071.74	19,874.81	18,812.87	26,172.18
Scalers' examination fees.....	985.00	.....	275.00	685.00	75.00	550.00	421.00
Exchange.....	42.93	69.36	56.82	102.36	217.36	210.69	132.77
Seizure expenses.....	1,779.06	889.97	825.43	320.92	376.28	495.59	690.68
General miscellaneous.....	14,588.67	11,027.32	9,539.08	8,087.43	7,278.83	5,276.06	6,905.58
Timber-berth rentals and bonus.....	20,823.00	21,551.73	20,776.78	21,353.02	23,073.80	20,263.45	22,432.27
Interest on timber-berth rentals and bonus.....	18.73	39.76	45.83	46.68	175.53	60.04	171.00
Transfer fees on timber berths.....	131.00	200.04	72.00	65.81	71.69	91.77	88.13
Grazing fees and interest.....	31,412.24	31,465.23	31,000.34	31,158.36	30,802.33	29,348.22	28,860.01
Taxation from Crown-granted timber lands.....	\$4,763,253.41	\$4,211,865.09	\$3,995,241.68	\$3,549,631.12	\$3,718,101.45	\$3,955,187.44	\$3,703,886.43
.....	246,677.15	230,739.81	208,039.90	200,382.25	205,401.63	216,860.46	237,173.83
Total revenue from forest sources.....	\$5,009,930.56	\$4,442,604.90	\$4,203,275.58	\$3,750,013.37	\$3,923,503.08	\$4,172,047.90	\$3,941,060.26



## AMOUNTS CHARGED AGAINST LOGGING OPERATIONS, 1946.

(32)

District.	Royalty.	Tax.	Trespass Stumpage.	Seizure Expenses.	GOVERNMENT SCALE.		SCALING FUND.		Stumpage.	Rentals, Cruising, Advertising, and Transfer Fees.	Total.
					Scaling Expenses.	Scaling Fees.	Scaling Expenses.	Scaling Fees.			
Vancouver.....	\$1,516,717.29	\$5,427.48	\$30,727.90	\$1,188.91	\$547.75	.....	\$41,134.20	\$157,116.30	\$925,511.03	\$33,947.91	\$2,712,318.77
Prince Rupert.....	150,885.31	1,461.67	3,182.29	.....	121.50	.....	2,662.65	9,947.79	200,711.69	14,754.02	383,726.92
Fort George.....	178,324.12	.....	4,936.94	422.81	31.30	.....	.....	.....	279,787.21	9,808.50	473,310.88
Kamloops.....	154,744.97	3,968.61	4,394.20	85.00	234.50	.....	.....	.....	225,445.16	23,213.32	412,085.76
Nelson.....	161,511.86	4,972.17	7,809.48	119.05	244.80	.....	.....	.....	223,696.81	17,964.14	416,318.31
Totals, 1946.....	\$2,162,183.55	\$15,829.93	\$51,050.81	\$1,815.77	\$1,179.85	.....	\$43,796.85	\$167,064.09	\$1,855,151.90	\$99,687.89	\$4,397,760.64
Totals, 1945.....	\$1,955,757.26	\$10,986.85	\$48,943.70	\$904.56	\$1,523.77	.....	\$40,280.68	\$125,083.36	\$1,577,898.98	\$73,927.60	\$3,535,311.76
Totals, 1944.....	\$1,959,140.27	\$11,668.31	\$54,647.11	\$785.43	\$4,450.77	.....	\$40,029.30	\$123,880.33	\$1,895,646.55	\$96,626.44	\$3,691,874.51
Totals, 1943.....	\$1,860,127.27	\$9,283.99	\$36,769.22	\$353.96	\$3,274.72	.....	\$33,369.74	\$113,265.63	\$1,082,866.31	\$85,858.24	\$3,230,169.08
Totals, 1942.....	\$1,975,067.18	\$57,125.20	\$19,489.98	\$331.56	\$1,017.17	\$268.50	\$36,944.89	\$122,731.57	\$949,463.02	\$71,684.25	\$3,234,123.32
Totals, 1941.....	\$2,368,592.99	\$100,732.39	\$22,424.64	\$481.18	\$588.26	\$392.44	\$38,359.49	\$147,441.90	\$843,116.13	\$64,178.18	\$3,586,307.60
Totals, 1940.....	\$2,104,949.92	\$83,147.74	\$15,844.80	\$491.70	\$295.34	\$549.54	\$36,024.08	\$145,435.20	\$734,472.57	\$36,020.04	\$3,157,230.93
Totals, 1939.....	\$1,734,599.75	\$67,280.72	\$16,155.25	\$323.53	\$369.75	\$364.01	\$30,526.84	\$127,366.46	\$604,222.28	\$33,720.82	\$2,615,429.41
Totals, 1938.....	\$1,548,487.63	\$70,393.15	\$11,349.95	\$638.85	\$251.74	\$521.22	\$28,119.98	\$110,576.44	\$533,106.60	\$33,756.30	\$2,342,201.86
Totals, 1937.....	\$1,906,740.31	\$64,478.43	\$18,298.31	\$337.74	\$79.07	\$228.35	\$26,481.94	\$121,365.53	\$552,703.92	\$34,408.99	\$2,725,122.59
Ten-year average, 1937-46.....	\$1,957,564.61	\$49,092.67	\$29,497.38	\$696.43	\$1,303.04	\$232.40	\$35,393.38	\$131,421.55	\$1,012,864.83	\$63,486.87	\$3,281,553.17



## AMOUNTS CHARGED AGAINST LOGGING OPERATIONS, FISCAL YEAR 1945-46.

(33)

District.	Royalty.	Tax.	Trespass Stumpage.	Seizure Expenses.	GOVERNMENT SCALE.		SCALING FUND.		Stumpage.	Rentals, Cruising, Advertising, and Transfer Fees.	Total.
					Scaling Expenses.	Scaling Fees.	Scaling Expenses.	Scaling Fees.			
Vancouver.....	\$1,361,325.01	\$4,133.47	\$32,877.64	\$832.50	\$493.25	.....	\$39,100.79	\$121,694.10	\$769,744.46	\$26,862.98	\$2,357,064.20
Prince Rupert.....	211,780.87	2,321.00	4,100.66	10.00	110.27	.....	10,257.88	1,827.97	195,308.79	12,286.81	438,004.25
Fort George.....	159,470.60	.....	2,107.83	83.81	63.00	.....	.....	.....	263,460.48	6,905.82	432,091.54
Kamloops.....	135,663.65	2,210.79	6,507.08	40.00	237.84	.....	.....	.....	215,139.45	18,644.99	378,443.80
Nelson.....	161,349.61	2,846.80	11,266.83	116.26	154.20	.....	.....	.....	243,847.54	15,415.51	434,996.75
Totals, 1945-46.....	\$2,029,589.74	\$11,512.06	\$56,860.04	\$1,082.57	\$1,058.56	.....	\$49,358.67	\$123,522.07	\$1,687,500.72	\$80,116.11	\$4,040,600.54
Totals, 1944-45.....	\$1,935,830.66	\$11,705.96	\$50,718.61	\$878.73	\$4,036.46	.....	\$40,496.75	\$126,724.56	\$1,421,693.72	\$73,308.83	\$3,665,394.28
Totals, 1943-44.....	\$1,952,728.39	\$8,425.35	\$42,192.20	\$361.46	\$3,675.98	.....	\$85,758.31	\$127,794.46	\$1,155,680.34	\$92,080.19	\$3,418,696.68
Totals, 1942-43.....	\$1,839,621.14	\$55,929.45	\$21,752.85	\$343.56	\$1,392.68	\$231.63	\$34,517.65	\$113,543.55	\$955,433.46	\$75,037.47	\$3,097,853.44
Totals, 1941-42.....	\$2,310,473.38	\$92,980.09	\$22,970.78	\$421.18	\$756.06	\$420.20	\$37,798.34	\$142,180.70	\$879,697.43	\$65,137.56	\$3,552,835.72
Totals, 1940-41.....	\$2,170,897.94	\$84,995.42	\$14,452.13	\$460.20	\$305.75	\$459.47	\$35,777.90	\$144,886.32	\$728,543.90	\$54,942.02	\$3,235,521.05
Totals, 1939-40.....	\$1,883,779.34	\$74,498.27	\$17,516.51	\$787.63	\$394.61	\$472.86	\$33,769.03	\$140,435.44	\$654,869.07	\$31,026.46	\$2,887,549.22
Totals, 1938-39.....	\$1,563,258.61	\$64,191.12	\$11,646.58	\$493.26	\$266.18	\$517.69	\$28,088.74	\$111,732.45	\$533,392.11	\$38,921.28	\$2,352,508.02
Eight-year average, 1938-39 to 1945-46.....	\$1,960,772.40	\$50,529.72	\$29,763.71	\$603.57	\$1,485.79	\$262.73	\$36,945.68	\$128,327.44	\$1,002,107.59	\$63,821.24	\$3,275,119.87



(34)

## FOREST REVENUE, FISCAL YEAR 1945-46.

		10-year Average.
Timber-licence rentals .....	\$401,609.33	\$456,232.00
Timber-licence transfer fees .....	1,675.00	1,272.00
Timber-licence penalty fees .....	10,453.79	19,837.00
Hand-loggers' licence fees .....	150.00	415.00
Timber-lease rentals .....	52,985.66	54,655.00
Timber-lease penalty fees and interest .....	16.22	279.00
Timber-sale rentals .....	58,910.22	36,129.00
Timber-sale stumpage .....	1,658,457.21	893,083.00
Timber-sale cruising .....	17,742.23	12,544.00
Timber-sale advertising .....	4,066.75	2,257.00
Timber royalty .....	2,023,237.70	1,962,495.00
Timber tax .....	7,875.71	42,789.00
Scaling fees (not Scaling Fund) .....		279.00
Scaling expenses (not Scaling Fund) .....	1,141.45	1,017.00
Trespass stumpage .....	47,323.99	22,731.00
Scalers' examination fees .....	70.00	358.00
Exchange .....	60.59	141.00
Seizure expenses .....	1,051.48	743.00
General miscellaneous .....	11,757.87	5,917.00
Timber-berth rentals, bonus, and fees .....	21,723.41	22,975.00
Interest on timber-berth rentals .....	38.83	183.00
Transfer fees on timber berths .....	230.00	89.00
Grazing fees and interest .....	31,601.70	26,923.00
	<hr/>	<hr/>
	\$4,352,179.14	\$3,563,343.00
Taxation from Crown-granted timber lands .....	244,980.89	238,223.00
	<hr/>	<hr/>
Totals .....	\$4,597,160.03	\$3,801,566.00



(35)

## FOREST EXPENDITURE, FISCAL YEAR 1945-46.

Forest District.	Salaries.	War Service, Temporary Assistance.	Temporary Assistance.	Expenses.	Total.
Vancouver.....	\$73,790.13	\$11,209.16	.....	\$56,429.71	\$141,429.00
Prince Rupert.....	25,465.81	5,277.83	\$225.00	28,715.52	59,684.16
Fort George.....	32,378.40	2,356.00	182.26	25,284.79	60,201.45
Kamloops.....	41,947.43	14,695.19	.....	23,020.15	79,662.77
Nelson.....	44,683.62	2,224.51	72.58	19,526.37	66,507.08
Victoria.....	104,234.19	24,145.60	436.25	40,521.11	169,337.15
Totals.....	\$322,499.58	\$59,908.29	\$916.09	\$193,497.65	\$576,821.61
Canadian Forestry Association.....					4,000.00
Reconnaissance.....					15,363.68
Forest research.....					12,986.91
Reforestation.....					166,732.29
Provincial Parks.....					27,772.02
Incidentals and contingencies.....					4,345.68
Grazing range improvements*.....					9,734.23
Forest Protection Fund*.....					650,000.00
Forest Reserve Account*.....					102,612.00
Grand total.....					\$1,570,368.42

\* Contributions from Treasury to special funds detailed elsewhere.

N.B.—The above figures do not include amounts paid as cost-of-living bonus, totalling \$56,583.85, made up as follows:—

Salaries.....	\$27,368.65
Temporary assistance.....	125.57
War service, temporary assistance.....	6,269.11
Expense.....	5,879.67
Reconnaissance.....	1,521.90
Forest research.....	1,214.43
Reforestation.....	11,512.01
Provincial Parks.....	2,692.51
	<u>\$56,583.85</u>

(36)

## SCALING FUND.

Balance, April 1st, 1945 (debit) .....	\$42,185.93
Collections, fiscal year 1945-46 .....	166,328.98
	<u>\$124,143.05</u>
Expenditures, fiscal year 1945-46 .....	205,764.04
	<u>\$81,620.99</u>
Balance, March 31st, 1946 (debit) .....	\$81,620.99
	<u>\$81,620.99</u>
Collections, nine months, April-December, 1946 .....	166,581.71
	<u>\$84,960.72</u>
Expenditures, nine months, April-December, 1946 .....	166,351.61
	<u>\$81,390.89</u>
Balance, December 31st, 1946 (debit) .....	\$81,390.89



(37)

## FOREST RESERVE ACCOUNT.

Balance brought forward, April 1st, 1945 .....	\$335,609.80
Amount received from Treasury, April 1st, 1945 (under subsection (2), section 32, "Forest Act") .....	102,612.00
	<u>\$438,221.80</u>
Moneys received under subsection (4), section 32, "Forest Act" .....	
Expenditures, fiscal year 1945-46 .....	51,354.48
	<u>Balance, March 31st, 1946 (credit) .....</u>
Amount received from Treasury, April 1st, 1946 (under subsection (2), section 32, "Forest Act") .....	\$386,867.32
	111,604.71
	<u>\$498,472.03</u>
Expenditures, nine months to December 31st, 1946 .....	88,720.16
	<u>Balance, December 31st, 1946 (credit) .....</u>
	<u>\$409,751.87</u>

(38)

## GRAZING RANGE IMPROVEMENT FUND.

Balance, April 1st, 1945 (credit) .....	\$29,769.83
Government contribution (section 14, "Grazing Act") .....	9,734.23
Other collections .....	9.00
	<u>\$39,513.06</u>
Expenditures, April 1st, 1945, to March 31st, 1946 .....	7,702.09
	<u>Balance, March 31st, 1946 (credit) .....</u>
Government contribution (section 14, "Grazing Act") .....	\$31,810.97
Other collections .....	10,533.90
	10.00
	<u>\$42,354.87</u>
Expenditures, April 1st, 1946, to December 31st, 1946 .....	6,082.95
	<u>Balance, December 31st, 1946 (credit) .....</u>
	<u>\$36,271.92</u>



(39)

## STANDING OF FOREST PROTECTION FUND, MARCH 31ST, 1946.

Balance (deficit), April 1st, 1945 .....	\$205,661.80
Expenditure .....	\$1,072,537.23
<i>Less</i> refunds .....	17,450.41
	<u>1,055,086.82</u>
	<u>\$1,260,748.62</u>

(See detailed summary of net expenditure on page 90.)

Government contribution .....	\$650,000.00
Collections, tax .....	249,229.50
Collections, slash and snags.....	\$16,417.90
<i>Less</i> refunds .....	9,089.37
	<u>7,328.53</u>
	<u>906,558.03</u>

Balance (deficit), March 31st, 1946 .....	<u><u>\$354,190.59</u></u>
---	----------------------------



FOREST PROTECTION EXPENDITURE FOR TWELVE MONTHS ENDED MARCH 31ST, 1946,  
BY THE FOREST SERVICE.

(40)

District.	SALARIES AND EXPENSES.		TOOLS AND EQUIPMENT.		Fires.	Improvements.	Aircraft.	Planning and Research.	Miscellaneous.	Total.
	Permanent.	Temporary.	Purchase.	Maintenance and Operation.						
Vancouver.....	\$50,961.77	\$87,569.40	\$4,492.80	\$55,462.50	\$60,426.05	\$1,710.75	.....	.....	\$5,453.71	\$266,076.98
Prince Rupert.....	9,558.73	21,253.09	1,554.59	5,369.38	2,156.16	630.01	.....	.....	876.33	41,398.29
Fort George.....	20,770.14	31,482.79	6,819.89	14,349.47	30,869.59	1,085.24	\$12,615.59	.....	2,346.71	120,339.42
Kamloops.....	32,508.04	62,584.20	5,235.56	27,421.36	34,083.27	1,489.18	.....	.....	3,066.83	166,388.44
Nelson.....	32,905.70	70,852.33	3,123.79	37,520.07	196,049.46	2,413.42	.....	.....	4,727.75	347,592.52
Victoria.....	41,238.78	2,317.90	24,014.02	14,923.99	.....	3,220.23	530.00	\$2,031.02	25,015.23	113,291.17
Totals.....	\$187,943.16	\$276,059.71	\$45,240.65	\$155,046.77	\$323,584.53	\$10,548.83	\$13,145.59	\$2,031.02	\$41,486.56	\$1,055,086.82



(41) REPORTED APPROXIMATE EXPENDITURE FOR TWELVE MONTHS ENDED  
DECEMBER 31ST, 1946, BY OTHER AGENCIES.

Forest District.	EXPENDITURES.				
	Patrols and Fire- prevention.	Tools and Equipment.	Fires.	Improve- ments.	Total.
Vancouver.....	\$130,144.00	\$115,254.00	\$115,857.62	\$2,910.00	\$364,165.62
Prince Rupert.....	558.00	1,250.00	1,291.27	600.00	3,699.27
Fort George.....	.....	.....	3,520.81	.....	3,520.81
Kamloops.....	.....	.....	6,139.14	.....	6,139.14
Nelson.....	2,275.00	23,250.00	8,013.00	2,400.00	35,938.00
Totals.....	\$132,977.00	\$139,754.00	\$134,821.84	\$5,910.00	\$413,462.84
Ten-year average, 1937-46.....	\$71,829.00	\$83,634.00	\$128,795.00	\$4,025.00	\$288,283.00

(42) SUMMARY OF ACREAGE LOGGED, 1946, AND DEALT WITH UNDER SECTION 113A.

	Acres.	Acres.
Total area logged, Vancouver Forest District.....	.....	58,502
Total area logged in hazard area, Vancouver Forest District .....	.....	57,424
1946 slash covered by hazard reports.....	31,941	
1946 slash logged after September 1st and carried over to 1947 (including 1,793 acres on which snag- falling only is required).....	25,483	
	.....	57,424
1946 slash covered by hazard reports.....	31,941	
1946 slash burned intentionally.....	15,474	
1946 slash burned accidentally.....	1,467	
1946 slash on which no burning was requested.....	7,028	
1946 slash on which additional time for burning has been granted .....	308	
1946 slash awaiting decision <i>re</i> compensation or addi- tional time for disposal.....	7,664	
1946 slash on which compensation has been assessed....	<i>Nil</i>	
	.....	31,941



## (48) SUMMARY OF 1946 OPERATIONS, VANCOUVER FOREST DISTRICT.

Total operations, hazard area, Vancouver Forest District.....	1,120
Number of intentional slash-burns.....	338
Number of operations on which slash was disposed of by lopping and scattering or land-clearing.....	5
Number of operations on which slash accidentally burned .....	28
Number of operations not required to burn.....	273
Number of operations given further time for slash- disposal .....	6
Number of operations not considered necessary to deal with under section 113A.....	212
Number of operations on which compensation has been assessed .....	Nil
Number of operations pending decision <i>re</i> assessment or further time for slash-disposal.....	137
Number of operations inactive in 1946.....	98
Number of operations snag-falling area only.....	28
Number of operations not advanced to a point requir- ing slash-disposal .....	6
	<hr/>
	1,131* 1,120

\* Difference noted above is accounted for by some operations disposing of slash by both accidental and intentional means and some conducting both spring and fall slash-burns.

## SUMMARY OF SLASH-HAZARD BEING CARRIED FOR DISPOSAL IN 1947.

	Aces.
Slash accumulated prior to 1946.....	5,661
Slash accumulated in 1946 (exclusive of 1,793 acres on which snag-falling only requirement).....	31,662
	<hr/>
Total slash at January 1st, 1947.....	37,323



(44)

## SUMMARY CHART A—INTENTIONAL SLASH-BURN.

Operations conducting slash-burn .....	338
Acres slash-burned in 1946—	
Created prior to 1944 .....	401
Created 1944 .....	1,058
Created 1945 .....	8,565
Created 1946 .....	15,474
Total .....	25,498
Acres of forest-cover burned .....	258
Total acres of area burned .....	25,756
Net damage to forest-cover .....	\$1,467.00
Net damage to property on operations and cut products .....	\$4,343.00
Cost of slash-disposal—	
Operators .....	\$41,447.00
Forest Service .....	Nil
Acreage hazard abated, 1946 .....	25,498
Cost to operator based on stand of 40 M. per acre .....	\$0.04 per M.
Cost to operator per acre .....	\$1.62
Total damage .....	\$5,810.00*

\* Of this total, \$4,262 damage occurred on one operation due to high winds at time of burn.

(45)

## RECAPITULATION SLASH-DISPOSAL, 1934-46.

Year.	ACRES OF SLASH BURNED.	
	Accidentally.	Intentionally.
1934 .....	4,927	15,935
1935 .....	11,783	13,239
1936 .....	1,340	7,691
1937 .....	3,015	27,516
1938 .....	35,071	50,033
1939 .....	1,930	51,603
1940 .....	2,265	33,034
1941 .....	3,385	5,524
1942 .....	4,504	80,226
1943 .....	2,046	40,013
1944 .....	5,121	27,278
1945 .....	3,897	46,467
1946 .....	2,174	25,498

(46)

## FIRE OCCURRENCES BY MONTHS, 1946.

Forest District.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Total.	Per Cent.
Vancouver.....	.....	1	110	19	105	146	42	3	426	24.96
Prince Rupert.....	.....	8	35	6	1	13	4	.....	67	3.92
Fort George.....	.....	13	68	12	22	30	11	.....	156	9.14
Kamloops.....	.....	9	112	20	161	219	80	4	605	35.44
Nelson.....	.....	4	35	29	164	214	7	.....	453	26.54
Totals.....	.....	35	360	86	453	622	144	7	1,707	100.00
Per cent.....	.....	2.05	21.09	5.04	26.54	36.44	8.43	0.41	100.00	.....
Ten-year average, 1937-46 .....	.....	58	196	188	575	476	200	9	1,702	.....
Per cent.....	.....	3.41	11.52	11.05	33.78	27.96	11.75	0.53	100.00	.....



(47)

## NUMBER AND CAUSES OF FOREST FIRES, 1946.

Forest District.	Lightning.	Campers.	Railways operating.	Smokers.	Brush-burning (not Railway-clearing).	Road and Power- and Telephone-line Construction.	Industrial Operation.	Incendiarism.	Miscellaneous (Known Causes).	Unknown Causes.	Total.	Per Cent. of Total Fires in Province.
Vancouver.....	83	38	76	117	22	10	28	2	47	3	426	24.96
Prince Rupert.....	2	15	4	10	13	.....	5	1	16	1	67	3.92
Fort George.....	24	58	2	21	29	3	2	2	10	5	156	9.14
Kamloops.....	185	136	37	105	48	2	3	3	66	20	605	35.44
Nelson.....	221	16	112	73	5	1	.....	2	20	3	453	26.54
Totals.....	515	263	231	326	117	16	38	10	159	32	1,707	100.00
Per cent.....	30.17	15.41	13.53	19.10	6.85	0.94	2.22	0.59	9.31	1.88	100.00	.....
Ten-year average, 1937-46.....	604	236	170	327	88	11	42	35	159	30	1,702	.....
Per cent.....	35.49	13.86	9.99	19.21	5.17	0.64	2.48	2.06	9.34	1.76	100.00	.....

(48)

## NUMBER AND CAUSES OF FOREST FIRES FOR THE LAST TEN YEARS.

Causes.	1946.	1945.	1944.	1943.	1942.	1941.	1940.	1939.	1938.	1937.	Total.
Lightning.....	515	541	408	256	704	871	1,265	515	703	263	6,041
Campers.....	263	183	203	157	158	142	236	305	442	269	2,358
Railways operating.....	231	426	329	210	114	73	90	77	72	74	1,702
Smokers.....	326	356	342	304	220	184	400	374	524	242	3,272
Brush-burning (not railway-clearing).....	117	69	51	58	30	81	74	111	180	107	878
Road and power- and telephone-line construction.....	16	5	10	8	31	4	5	11	4	14	108
Industrial operations.....	38	32	51	20	38	33	41	32	77	55	417
Incendiarism.....	10	32	13	7	5	20	38	88	121	20	354
Miscellaneous (known causes).....	159	155	210	136	90	134	171	175	238	124	1,592
Unknown causes.....	32	39	50	23	24	19	18	16	51	25	297
Totals.....	1,707	1,838	1,667	1,185	1,414	1,561	2,338	1,704	2,412	1,193	17,019

(49)

## FIRES CLASSIFIED BY SIZE AND DAMAGE, 1946.

Forest District.	TOTAL FIRES.		UNDER ¼ ACRE.			¼ TO 10 ACRES.			OVER 10 TO 500 ACRES.			OVER 500 ACRES IN EXTENT.			DAMAGE.		
	Number.	Per Cent. of Total Fires in Province.	Number.	Per Cent. of Total Fires in District.	Per Cent. of Total Fires in this Class.	Number.	Per Cent. of Total Fires in District.	Per Cent. of Total Fires in this Class.	Number.	Per Cent. of Total Fires in District.	Per Cent. of Total Fires in this Class.	Number.	Per Cent. of Total Fires in District.	Per Cent. of Total Fires in this Class.	Under \$100.	Between \$100 and \$1,000.	Over \$1,000.
Vancouver.....	426	24.96	249	58.45	28.49	134	31.46	26.17	40	9.39	15.38	3	0.70	4.92	392	20	14
Prince Rupert.....	67	3.92	27	40.30	3.09	20	29.85	3.91	16	23.88	6.15	4	5.97	6.56	59	6	2
Fort George.....	156	9.14	59	37.82	6.75	48	30.77	9.38	34	21.79	13.08	15	9.62	24.59	125	23	8
Kamloops.....	605	35.44	247	40.83	28.26	193	31.90	37.69	132	21.82	50.77	33	5.45	54.09	543	51	11
Nelson.....	453	26.54	292	64.46	33.41	117	25.83	22.85	38	8.39	14.62	6	1.32	9.84	427	22	4
Totals.....	1,707	100.00	874	.....	100.00	512	.....	100.00	260	.....	100.00	61	.....	100.00	1,546	122	39
Per cent.....	100.00	.....	51.20	.....	.....	29.99	.....	.....	15.23	.....	.....	3.58	.....	.....	90.57	7.15	2.28
Ten-year average, 1937-46.....	1,702	.....	884	.....	.....	523	.....	.....	253	.....	.....	42	.....	.....	1,563	92	47
Per cent.....	100.00	.....	51.94	.....	.....	30.73	.....	.....	14.86	.....	.....	2.47	.....	.....	91.83	5.41	2.76



(50)

## DAMAGE TO PROPERTY OTHER THAN FORESTS, 1946.\*

Forest District.	Forest Products in Process of Manufacture.	Buildings.	Railway and Logging Equipment.	Miscellaneous.	Total.	Per Cent. of Total.
Vancouver.....	\$50,809.00	\$500.00	\$77,489.00	\$13,185.00	\$141,983.00	85.37
Prince Rupert.....	1,700.00	400.00	.....	.....	2,100.00	1.26
Fort George.....	1,447.00	6,210.00	4,000.00	1,385.00	13,042.00	7.84
Kamloops.....	805.93	1,655.00	12.00	1,894.50	4,367.43	2.63
Nelson.....	956.20	625.00	.....	3,241.00	4,822.20	2.90
Totals.....	\$55,718.13	\$9,390.00	\$81,501.00	\$19,705.50	\$166,314.63	100.00
Per cent.....	33.50	5.64	49.01	11.85	100.00	.....
Ten-year average, 1937-46.....	\$100,399.00	\$32,253.00	\$89,611.00	\$31,467.00	\$253,730.00	.....
Per cent.....	39.57	12.71	35.32	12.40	100.00	.....

\* Does not include intentional slash-burns. For this item see page 93.

(51)

## DAMAGE TO FOREST-COVER CAUSED BY FOREST FIRES, 1946—PART I.\*

Forest District.	ACCESSIBLE MERCHANTABLE TIMBER.				INACCESSIBLE MERCHANTABLE TIMBER.			IMMATURE TIMBER.	
	Net Area killed.	Total Volume killed.	Salvable Volume of Timber killed.	Net Stumpage Loss.	Net Area killed.	Total Volume killed.	Damage.	Net Area killed.	Present Value.
	Acres.	M.B.M.	M.B.M.	\$	Acres.	M.B.M.	\$	Acres.	\$
Vancouver.....	1,072	3,276	1,168	5,102	162	390	214	1,627	16,516
Prince Rupert.....	4,093	26,765	13,147	3,486	4,676	.....	1,169	2,466	1,185
Fort George.....	4,771	24,184	1,213	37,437	50	150	12	8,364	14,385
Kamloops.....	2,126	4,969	139	5,455	312	2,347	2,377	18,165	26,642
Nelson.....	879	4,798	483	5,770	560	2,240	140	2,423	5,343
Totals.....	12,941	63,992	16,150	57,250	5,760	5,127	3,912	33,045	64,071
Per cent.....	4.27	92.58	25.24	29.87	1.90	7.42	2.04	10.89	33.43
Ten-year average, 1937-46.....	.....	.....	59,963	.....	.....	.....	.....	57,334	194,140

\* Does not include intentional slash-burns. For this item see page 93.

(51)

## DAMAGE TO FOREST-COVER CAUSED BY FOREST FIRES, 1946—PART II.\*

Forest District.	NOT SATISFACTORILY RESTOCKED.				NON-COMMERCIAL COVER.		GRAZING OR PASTURE LAND.		NON-PRODUCTIVE SITES.		GRAND TOTALS.		
	Logged unburned.	Logged and burned.	Burned, not logged.	Damage.	Area burned.	Damage.	Area burned.	Damage.	Area burned.	Damage.	Area.	Quantity.	Damage.
	Acres.	Acres.	Acres.	\$	Acres.	\$	Acres.	\$	Acres.	\$	Acres.	M.B.M.	\$
Vancouver.....	2,320	605	505	975	1,564	416	24	1	2,691	634	10,570	3,666	23,858
Prince Rupert.....	96	.....	2,508	651	3,000	746	288	15	13,012	3,253	30,139	26,765	10,505
Fort George.....	102	100	42,225	10,674	50,792	12,698	33,876	1,694	21,651	5,413	161,931	24,334	82,313
Kamloops.....	429	151	6,061	1,842	40,047	18,339	18,832	4,527	2,950	720	89,073	7,316	59,902
Nelson.....	245	4	1,769	576	2,302	707	167	127	3,333	2,428	11,682	7,038	15,091
Totals.....	3,192	860	53,068	14,718	97,705	32,906	53,187	6,364	43,637	12,448	303,395	69,119	191,669
Per cent.....	1.05	0.29	17.49	7.68	32.20	17.17	17.53	3.32	14.38	6.49	100.00	100.00	100.00
Ten-year average, 1937-46.....	.....	.....	.....	.....	.....	.....	19,288	1,352	.....	.....	330,884	210,983	541,198

\* Does not include intentional slash-burns. For this item see page 93.



## (52) FIRE CAUSES, FOREST SERVICE COST, AND TOTAL DAMAGE, 1946.\*

Causes.	No.	Per Cent.	Cost.	Per Cent.	Damage.	Per Cent.
Lightning.....	515	30.17	\$98,115.49	62.71	\$43,827.49	12.24
Campers.....	263	15.41	12,461.08	7.96	43,485.00	12.15
Railways operating.....	231	13.53	462.74	0.29	4,238.66	1.18
Smokers.....	326	19.10	24,860.41	15.89	69,976.16	19.54
Brush-burning (not railway-clearing).....	117	6.85	4,301.08	2.75	60,495.66	16.90
Road and power- and telephone-line construction.....	16	0.94	.....	.....	5,137.25	1.44
Industrial operations.....	38	2.22	3,024.00	1.96	76,894.74	21.48
Incendiarism.....	10	0.59	5,548.28	3.54	25,489.70	7.12
Miscellaneous (known causes).....	159	9.31	7,105.50	4.54	23,974.22	6.70
Unknown causes.....	32	1.88	572.73	0.36	4,464.75	1.25
Totals.....	1,707	100.00	\$156,451.31	100.00	\$357,983.63	100.00

\* Does not include intentional slash-burns. For this item see page 93.



## COMPARISON OF DAMAGE CAUSED BY FOREST FIRES IN LAST TEN YEARS.

(55)

	1946.	1945.	1944.	1943.	1942.	1941.	1940.	1939.	1938.	1937.	Total, 10 Years.
Total number of fires.....	1,707	1,838	1,667	1,185	1,414	1,561	2,338	1,704	2,412	1,193	17,019
Area burned (acres).....	303,395	352,392	506,148	94,842	446,544	154,888	490,003	193,468	711,818	54,843	3,308,841
Standing timber destroyed or damaged (M. ft. B.M.).....	69,119	534,502	98,075	15,612	128,890	341,636	252,512	43,755	1,047,541	13,263	2,549,905
Amount salvable (M. ft. B.M.).....	16,150	120,021	10,937	719	4,341	3,123	37,092	6,154	400,527	565	599,629
Damage to forests.....	\$191,669	\$1,092,537	\$448,180	\$63,731	\$859,037	\$483,002	\$486,577	\$195,018	\$1,555,849	\$36,384	\$5,411,984
Damage to other forms of property.....	166,315	350,516	204,345	69,196	477,459	65,303	231,919	177,706	675,166	119,380	2,537,305
Total damage.....	\$357,984	\$1,443,053	\$652,525	\$132,927	\$1,336,496	\$548,305	\$718,496	\$372,724	\$2,231,015	\$155,764	\$7,949,289

## FIRES CLASSIFIED BY FOREST DISTRICT, PLACE OF ORIGIN, AND COST PER FIRE OF FIRE-FIGHTING, 1946.

(54)

Forest District.	Total Fires.	TOTAL FOREST SERVICE COST.			EXTINGUISHED WITHOUT COST.			COST MONEY TO EXTINGUISH.						
		Dollars.	Per Cent.	Average Expenditure per Cost Fire (Dollars).	Number.	Per Cent. of Total Fires in District.	Per Cent. of Total Fires in Province.	Number.	Per Cent. of Total Fires in District.	Per Cent. of Total Fires in Province.	Cost less than \$100 per Fire.	Cost \$100 to \$1,000 per Fire.	Cost over \$1,000 to \$5,000 per Fire.	Cost over \$5,000 to \$10,000 per Fire.
Vancouver.....	426	152	274	9,514.53	6.08	49.81	13.77	191	44.84	11.19	135	41	11	3
Prince Rupert.....	67	20	47	4,274.52	2.73	133.58	2.05	32	47.76	1.88	24	6	2	.....
Fort George.....	156	113	43	17,437.43	11.15	167.67	3.04	104	66.67	6.09	70	30	3	.....
Kamloops.....	605	503	102	36,915.09	23.60	122.24	17.75	302	49.92	17.69	225	68	9	.....
Nelson.....	453	337	116	88,309.74	56.44	335.78	11.13	263	58.06	15.41	193	44	22	4
Totals.....	1,707	1,125	582	156,451.31*	100.00	175.39	47.74	892	.....	52.26	647	189	47	3
Per cent.....	100.00	65.90	34.10	.....	.....	47.74	.....	52.26	.....	.....	37.90	11.07	2.76	0.35
Ten-year average, 1937-46.....	1,702	1,082	620	198,900.00	.....	217.61	.....	914	.....	.....	702	165	37	6
Per cent.....	100.00	63.57	36.43	.....	.....	46.30	.....	53.70	.....	.....	41.24	9.70	2.17	0.35

\* Cost correct to date. Subject to later revision.

Cost to other parties (355 cost fires), \$134,821.84; cost to Forest Service (892 cost fires), \$156,451.31.

Detailed final costs are published one year in arrears in the table "Expenditure by Districts" in each annual report.



(55)

## PROSECUTIONS, 1946.

Forest District.	Information laid.	Burning without Permit.	Failure to control and extinguish Fire.	Failing to report Fires.	Refusing to render Assistance in Fire-fighting.	FINES.		Served Sentence in Gaol.	Suspended Sentence.	Cases dismissed.	Cases withdrawn.
						Number.	Amount.				
Vancouver.....	7	7	.....	.....	.....	5	\$125.00	.....	2	.....	.....
Prince Rupert.....	9	7	2	.....	.....	5	225.00	.....	4	.....	.....
Fort George.....	8	5	.....	.....	3	4	100.00	.....	4	.....	.....
Kamloops.....	7	3	.....	1	3	3	75.00	1	1	2	.....
Nelson.....	8	6	.....	.....	2	7	204.25	.....	1	.....	.....
Totals.....	39	28	2	1	8	24	\$729.25	1	12	2	.....
Ten-year average, 1937-46.....	36	.....	.....	.....	.....	25	\$594.28	.....	.....	.....	.....



## BURNING PERMITS, 1946.

(56)

Forest District.	CLEARING AGRICULTURAL LAND.				CLEARING LOGGING-SLASH.				CLEARING RAILWAY RIGHT-OF-WAY.				CLEARING PUBLIC ROADS.				GRAND TOTALS.			
	No.	Acres.	Fires escaped	Fires set with- out Permit.	No.	Acres.	Fires escaped	Fires set with- out Permit.	No.	Acres.	Fires escaped	Fires set with- out Permit.	No.	Acres.	Fires escaped	Fires set with- out Permit.	No.	Acres.	Fires escaped	Fires set with- out Permit.
Vancouver.....	4,258	2,883	17	3	220	16,103	1	.....	13	.....	.....	.....	73	2,030	9	.....	4,564	21,016	27	3
Prince Rupert.....	509	1,184	6	10	42	17	.....	.....	13	.....	4	.....	7	2	.....	.....	571	1,203	10	10
Fort George.....	860	5,090	4	8	113	668	.....	.....	3	3	1	.....	233	1,318	2	.....	1,209	7,079	7	8
Kamloops.....	1,104	3,351	2	3	46	202	.....	.....	2	.....	.....	.....	20	67	2	.....	1,172	3,620	4	3
Nelson.....	1,244	4,920	5	.....	.....	.....	.....	.....	64	43	.....	.....	7	19	.....	1	1,315	4,982	5	1
Totals.....	7,975	17,428	34	24	421	16,990	1	.....	95	46	5	.....	340	3,436	13	1	8,831	37,900	53	25
Per cent.....	90.30	45.99	64.16	96.00	4.77	44.83	1.88	.....	1.08	0.12	9.43	.....	3.85	9.06	24.53	4.00	100.00	100.00	100.00	100.00
Ten-year average, 1937-46.....	6,716	17,148	42	17	421	25,426	8	.....	91	1,011	6	.....	164	1,989	6	1	7,392	45,574	62	18
Per cent.....	90.86	37.62	67.74	94.44	5.69	55.79	12.90	.....	1.23	2.22	9.68	.....	2.22	4.37	9.68	5.56	100.00	100.00	100.00	100.00



(57)

## FOREST SERVICE LIBRARY.

Classification.	ITEMS RECEIVED AND CATALOGUED.			
	Up to 1944.	1945.	1946.	Total.
Bound volumes.....	365	13	12	390
Government reports and bulletins, etc.....	3,317	80	126	3,523
Pamphlets, etc.....	926	61	79	1,066
Totals.....	4,608	154	217	4,979
Periodicals and trade journals.....	.....	48	51	.....
References indexed.....	32,464	1,294	1,523	35,281

(58)

## GRAZING PERMITS ISSUED.

District.	No. of Permits issued.	NUMBER OF STOCK UNDER PERMIT.		
		Cattle.	Horses.	Sheep.
Kamloops.....	1,043	95,015	3,917	29,133
Nelson.....	299	8,954	958	2,042
Fort George.....	37	2,304	160	99
Totals, 1946.....	1,379	106,273	5,035	31,274
Totals, 1945.....	1,378	109,201	5,064	39,235
Totals, 1944.....	1,320	101,606	4,862	40,858
Totals, 1943.....	1,221	93,497	4,844	39,921
Totals, 1942.....	1,130	84,788	4,797	36,962
Totals, 1941.....	1,064	77,774	4,180	39,552
Totals, 1940.....	881	74,404	3,958	37,132
Totals, 1939.....	790	69,447	2,758	38,357
Totals, 1938.....	738	72,774	2,248	37,060
Totals, 1937.....	807	75,123	2,328	42,185
Ten-year average, 1937-46.....	1,071	86,489	4,007	38,254

(59)

## GRAZING FEES BILLED AND COLLECTED.

Year.	Fees billed.	Fees collected.	Outstanding.
1939.....	\$21,348.41	\$22,027.05	\$42,012.10
1940.....	23,338.28	38,146.48	27,203.90
1941.....	23,781.19	29,348.22	21,636.87
1942.....	25,116.02	30,802.33	15,950.56
1943.....	24,680.37	31,148.36	9,482.57
1944.....	28,554.02	31,000.34	7,036.25
1945.....	30,066.34	31,465.23	5,637.36
1946.....	30,120.38	31,412.24	4,345.50

VICTORIA, B.C.:

Printed by DON McDIARMID, Printer to the King's Most Excellent Majesty.  
1947.



