PROVINCE OF BRITISH COLUMBIA

DEPARTMENT OF LANDS, FORESTS, AND WATER RESOURCES

HON. R. G. WILLISTON, *Minister* J. S. STOKES, *Deputy Minister of Forests*

REPORT

of the

FOREST SERVICE

YEAR ENDED DECEMBER 31

1970

Printed by K. M. MACDONALD, Printer to the Queen's Most Excellent Majesty
in right of the Province of British Columbia.
1971

VICTORIA, BRITISH COLUMBIA, March 1971.

To Colonel the Honourable JOHN R. NICHOLSON, P.C., O.B.E., Q.C., LL.D.,
Lieutenant-Governor of British Columbia.

MAY IT PLEASE YOUR HONOUR:

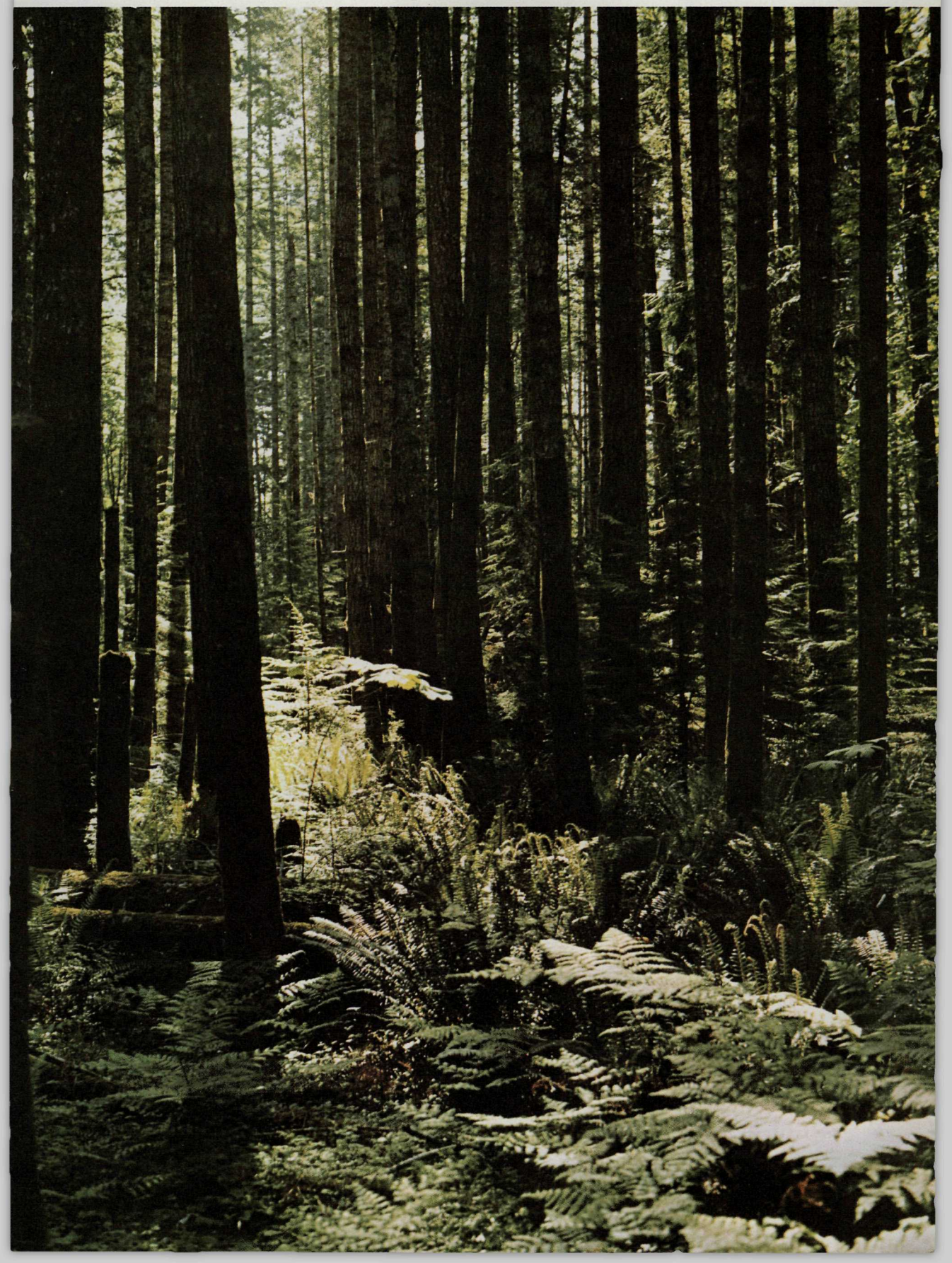
Herewith I respectfully submit the Annual Report of the Forest Service of the Department of Lands, Forests, and Water Resources for 1970.

R. G. WILLISTON
Minister of Lands, Forests, and Water Resources

The Honourable R. G. Williston,
Minister of Lands, Forests, and Water Resources,
Victoria, British Columbia.

SIR: This is the Annual Report of the Forest Service for 1970.

J. S. STOKES
Deputy Minister of Forests



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REPORT OF THE FOREST SERVICE, 1970

CHIEF FORESTER'S REPORT

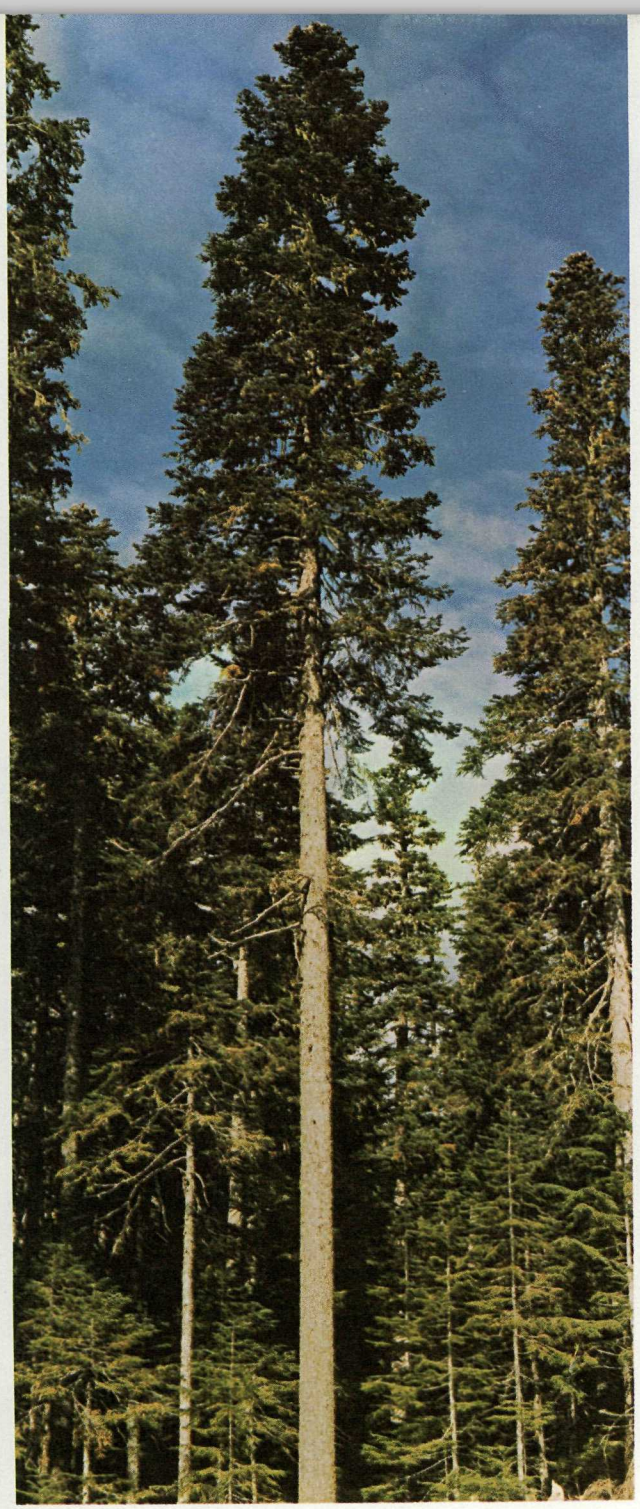
Unfavourable market conditions, labour troubles, a tight-money policy, and the worst fire season on record combined to make 1970 a financial problem year for both the Forest Service and the forest industries.

Brighter aspects, however, were recorded in a number of areas, including the reforestation programme, further expansion of close-utilization practices, and the development of new policies relating to multiple use of publicly owned forest lands. Of significant importance to the multiple-use concept was the formation of the new interdepartmental Land Use Committee, with representation from all departments concerned with land use.

Among the year's highlights:

- Direct forest revenue collected in 1970 dropped by 27.4 per cent to $64,951,431 —but still the second-highest total on record.
- The total scale of all products was 1,932,628,437 cubic feet—an increase of 2.2 per cent over 1969.
- Unit standard surveys continued over approved and proposed public sustained-yield units, and such information is now available on 97,000,000 acres.
- Fourteen public sustained-yield units were gazetted as Forest Reserves after consultation and approval of the new interdepartmental Land Use Committee.
- The Forest Service established a special productivity committee. Its primary objective is a uniform method of forest-land classification for intensified management. It will co-ordinate all research done by Government, industry, and other agencies into increased forest production throughout the Province.
- Poor lumber-market conditions resulted in an increase in log exports, from both exportable and nonexportable lands. The log export accounted for 300,291,963 board feet—about 2.6 per cent of the Provincial cut.
- There are now 230 mills with chippers, and 202 barkers. This is a decrease from last year and is attributed to a general consolidation of manufacturing plants.
- Recovery of flood-killed timber in Ootsa Lake continued, with significant success.
- Amalgamation of Tree-farm Licences 1 and 40 was completed, reducing the total number to 34.
- As a result of a special study by a Forest Service/industry committee, the firm-wood cubic scale will become the only unit of measure throughout the Province, commencing January 1, 1972.
- Conversion from manual scaling to weight-scaling continued throughout the Province—there are now 111 weigh-scales, compared with 91 in 1969. (There were only 40 in 1966.)
- During 1970 the Forest Service assumed responsibility for forest recreation in areas under its jurisdiction—by the year's end, forest recreation plans were being incorporated within the multiple-use framework of administration.
- The Engineering Division continued to provide a variety of support services for the housing, transportation, construction, and communication needs of the Forest Service, in addition to technical and professional investigations and reports for administrative use.

- Clearing operations continued on Lake Williston and on the Mica Dam and Libby Dam pondages.
- The continuing road programme included location of 150 miles of new road, construction of 35 miles of grade, erection of two new bridges, rebuilding of eight other bridges to increase the load capacity, and maintenance on 840 miles of previously built roadway.
- A number of engineering studies was undertaken, including a survey of mill waste, a review of scarification equipment, an estimate of the floating wood on Lake Williston, participation in an evaluation of potential pulpable wood residues, and a study of log and debris salvage in the Strait of Georgia.
- Forage production was below average on most Crown ranges due to dry conditions. The hay supply was adequate, and cattle prices averaged higher than in 1969.
- There were 4,003 forest fires throughout the Province, and the Forest Service's direct cost of fighting them was $9,166,167. The fires covered 260,958 acres —compared to the 10-year-average of 263,437 acres.
- Despite bad-weather setbacks, Forest Service nurseries lifted a record 35,479,700 seedlings in 1970—an increase of nearly 7,000,000 over 1969. Significant successes have been recorded in the growing of Sitka spruce and Western hemlock in containers.
- In its second year of operation, the Surrey Nursery produced 7,000,000 seedlings.
- In its continually expanding operations, the Information Division late in 1970 commenced a weekly series of TV programmes relating to the Forest Service on Victoria's new Cable 10-TV, an educational-information channel. By year's end, plans were made to present a 13-week series of programmes on Vancouver's Cable 10-TV outlet.
- At the end of 1970 there were 906 permanent personnel serving with the Forest Service—the same as last year.



AMABALIS FIR

inventory division

INVENTORY DIVISION

HIGHLIGHTS

With continuation of unit standard surveys over approved and proposed public sustained-yield units (PSYU), information is now available on 97,000,000 acres.

Field work in 1970 covered 6,000,000 more acres than were surveyed in 1969.

Loss-factor work commenced in northern British Columbia in the proposed Stikine PSYU.

Stand-table information as to number of trees per acre by diameter class, snags per acre, vets per acre in immature, etc., is now being provided.

Fourteen public sustained-yield units were gazetted as Forest Reserves.

As an aid to land-use planning, each project supervisor will provide recommendations on his project relating to ecological reserves, park reserves, recreational areas, wild-fowl sanctuaries, etc.

1970 PROGRESS

Classification and sampling of mature and immature stands, derivation of loss factors, and determination of the growth and yield of immature stands continued throughout 1970.

The Division completed field work to unit standard on six public sustained-yield units and part of a seventh, two small special sale areas (SSA), two proposed sustained-yield units, and an unregulated area. A total of 19,495,370 acres was brought to unit standard, an increase of more than 6,000,000 acres over the area surveyed in 1969.

Table A—1970 Field Work

Unit Standard Inventory

Public Sustained-yield Unit, Special Sale Area, Etc.	Maps Classified	Number of Samples		Total Estimated Acreage
		Immature	Mature	
Barton Hill	13	9	102	167,865
Botanie	66	84	228	1,429,734
E & N Crown (unregulated)	48	202	17	148,000
Fort St. James SSA	6	------	------	49,862
Furry Creek SSA	4	13	9	24,691
Kotcho (proposed)	250	210	108	6,035,010
Moberly	96	130	86	2,019.574
Nicola	59	142	184	1,218,552
Stikine (proposed) [1]	69	107	234	4,952,594
Stuart Lake	67	61	71	1,539,519
Takla (southern portion)	33	35	22	854,196
Vancouver	58	158	150	1,055,773
Totals	769	1,151	1,211	19,495,370

Loss Factors

Kinbasket	------	------	13	------
Stikine (proposed)	------	------	15	------
Total	------	------	28[2]	------

[1] Map scale of 1 inch=40 chains.
[2] Felled samples.

Table A—1970 Field Work—Continued

Growth and Yield

Public Sustained-yield Unit, Special Sale Area, Etc.	Maps Classified	Number of Samples		Total Estimated Acreage
		Immature	Mature	
Cottonwood	------	52	------	------
Narcosli	------	85	------	------
Ootsa	------	28	------	------
Total	------	165[3]	------	------

[3] Permanent remeasurable samples.

The proposed Kotcho PSYU provided an interesting operational problem as there were no summer access roads. Base camp was situated at the old radar station in Fort Nelson, and fixed-wing aircraft, together with classification helicopters, were used to move men and supplies to sub-bases established throughout the unit. Rubber rafts enabled the crews to traverse numerous areas of the Kotcho which were relatively inaccessible by other methods.

Communications are gradually improving in the northern part of the Province as single side-band transceivers are being placed in base camps.

The Division completed compilation of all 1969 units in Table B by December 1970, and reports were released.

Table B—Production of Final Forest-cover Maps for 1969 Projects

Public Sustained-yield Unit	Number of Maps	Forest and Nonforest Area in Acres			Volume in Cunits for Mature Crown Area
		Crown	Alienated	Total	
Ashnola	31	586,258	112,666	698,924	9,049,410[1]
Big Valley	25	392,590	12,951	405,541	13,226,590[1]
Cottonwood	30	480,242	5,001	485,243	14,319,160[1]
Fontas (proposed)	160	3,996,583	56,725	4,053,308	5,414,720[1]
Kingcome (Kyuquot portion)	11	81,173	22,370	103,543	6,173,860[2]
Lardeau	104	1,975,063	278,755	2,253,818	20,449,250[1]
Naver	21	325,233	2,539	327,772	6,669,060[1]
Nootka	91	788,231	145,115	933,346	60,130,320[2]
Similkameen	44	872,515	87,020	959,535	14,640,930[1]
Wapiti	131	2,871,533	15,079	2,886,612	17,486,360[1]
Willow River	23	319,807	7,881	327,688	6,293,540[1]
Totals	671	12,689,228	746,102	13,435,330	173,853,200

[1] Volume at 7.1"+d.b.h. close utilization less decay.
[2] Volume at 9.1"+d.b.h. close utilization less decay.

Decay studies continued in the hemlock-cedar wet belt of the Kinbasket PSYU. A start was made in the northern units (proposed), with a smaller crew operating in the proposed Stikine PSYU.

Additional data obtained in 1969 permitted division of Zone 4 spruce and balsam loss factors into two local groupings. These two local groupings are:

(*a*) Units northwest of Prince George—Carp, Crooked River, Parsnip, Stuart, and Takla PSYU's.

(*b*) Units south and east of Prince George—Big Valley, Bowron, Cottonwood, Longworth, Naver, Purden, Quesnel Lake, Robson, Westlake, and Willow River PSYU's and the Prince George SSA.

BRITISH COLUMBIA FOREST SERVICE INVENTORY DIVISION

UNIT SURVEYS 1961 +

COMPLETED (1961-69 Fieldwork)

1. Adams
2. Arrowhead
3. Ashnola
5. Barriere
8. Big Bar
9. Big Valley
10. Blueberry
12. Bowron
13. Burns Lake
16. Chilko
17. Cottonwood
18. Cranbrook
21. Dean
22. Dewdney
24. Edgewood
25. Fernie
29. Granby
30. Hecate
31. Kamloops Region S.S.A.
32. Kettle
33. Kinbasket
34. Kingcome (Seymour, Klinaklini, Kyuquot)
36. Lardeau
39. Monkman
41. Nakusp
42. Narcosli
43. Naver
44. Nechako
45. Nehalliston
47. Niskonlith
48. Nootka
49. North Thompson
50. Okanagan
51. Ootsa
52. Parsnip
54. Prince George S.S.A.
55. Purden
56. Quadra
57. Queen Charlotte
59. Raft
60. Rivers Inlet
62. Salmo
63. Salmon Arm
64. Shuswap
65. Similkameen
66. Skeena
67. Slocan
68. Smithers
69. Soo
72. Stum
74. Upper Kootenay
76. Wapiti
77. Westlake
79. Willow River
80. Windermere
81. Yalakom
86. Fontas Proposed
87. Fort Nelson Proposed

AVAILABLE INFORMATION (1961-69 Fieldwork)

(a) Maps - all at 1/4 mile to inch except Dean Block 1, Hecate.
(b) Statements - area and volume statements for each map.
(c) Reports - for each P.S.Y.U., a unit survey report.

IN PROGRESS (1970 Fieldwork)

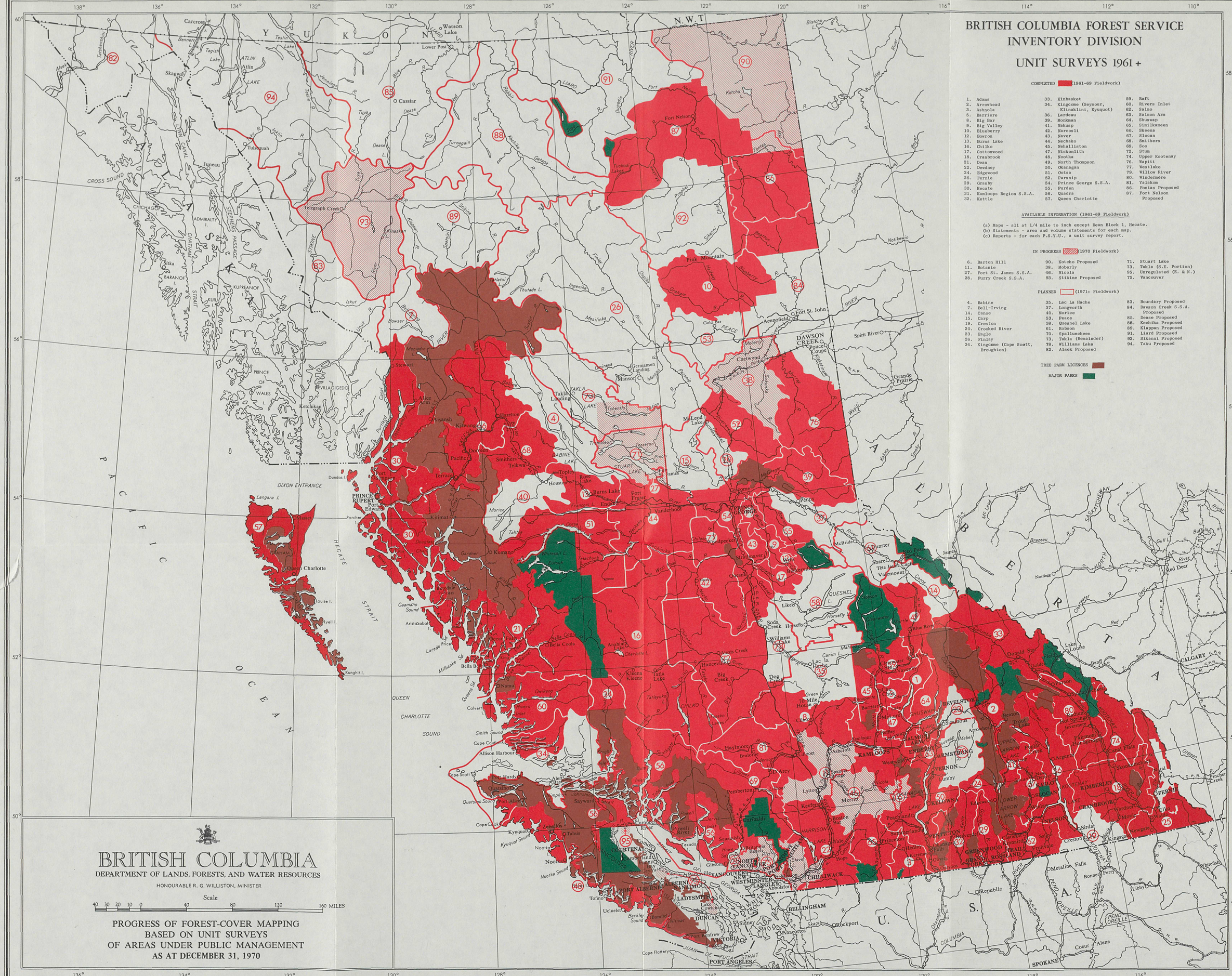
6. Barton Hill
11. Botanie
27. Fort St. James S.S.A.
28. Furry Creek S.S.A.
90. Kotcho Proposed
38. Moberly
46. Nicola
93. Stikine Proposed
71. Stuart Lake
73. Takla (S.E. Portion)
95. Unregulated (E. & N.)
75. Vancouver

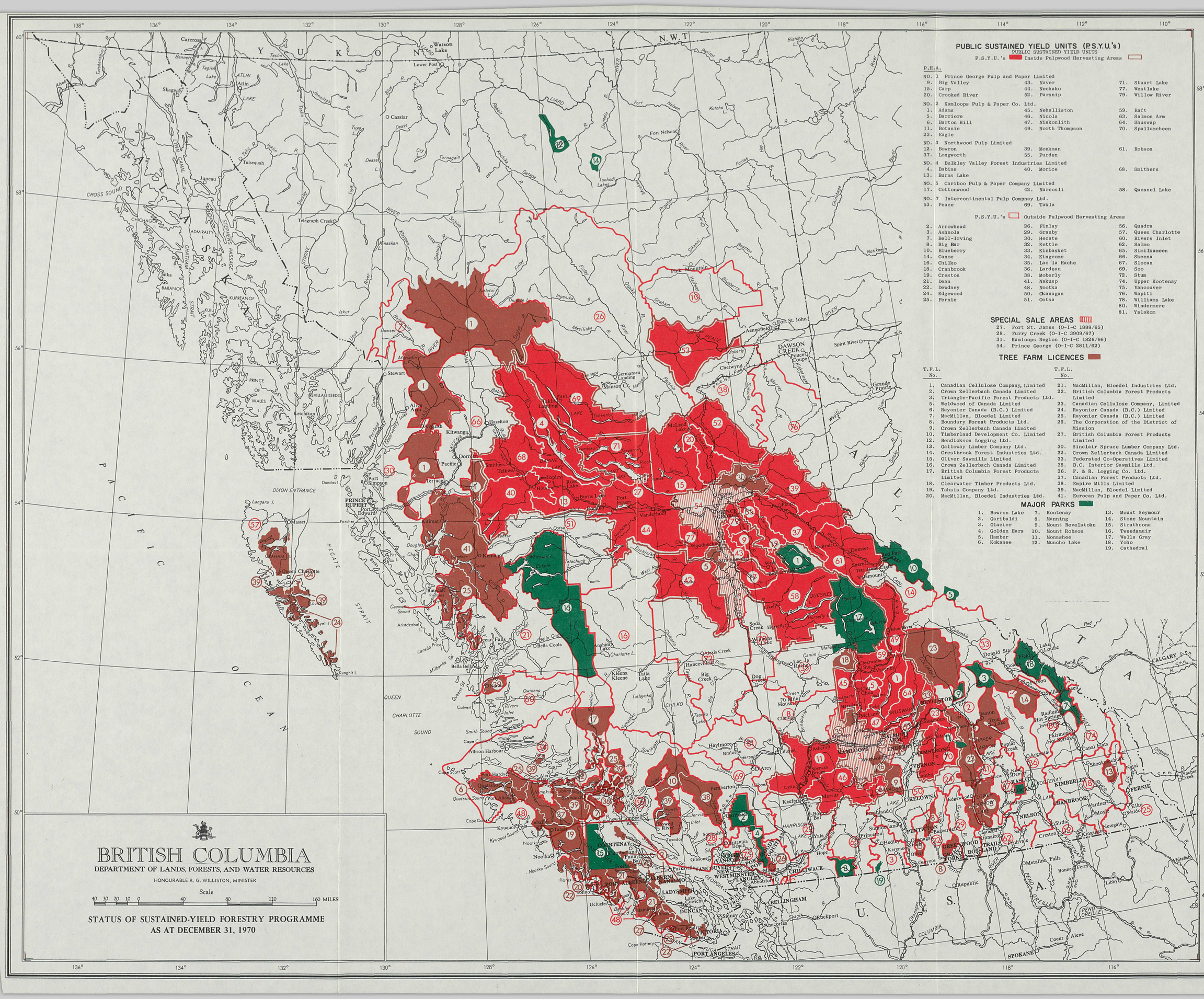
PLANNED (1971+ Fieldwork)

4. Babine
7. Bell-Irving
14. Canoe
15. Carp
19. Creston
20. Crooked River
23. Eagle
26. Finlay
34. Kingcome (Cape Scott, Broughton)
35. Lac La Hache
37. Longworth
40. Morice
53. Peace
58. Quesnel Lake
61. Robson
70. Spallumcheen
73. Takla (Remainder)
78. Williams Lake
82. Alsek Proposed
83. Boundary Proposed
84. Dawson Creek S.S.A. Proposed
85. Dease Proposed
88. Kechika Proposed
89. Klappan Proposed
91. Liard Proposed
92. Sikanni Proposed
94. Taku Proposed

TREE FARM LICENCES

MAJOR PARKS


BRITISH COLUMBIA
DEPARTMENT OF LANDS, FORESTS, AND WATER RESOURCES
HONOURABLE R. G. WILLISTON, MINISTER
Scale
40 30 20 10 0 40 80 120 160 MILES
PROGRESS OF FOREST-COVER MAPPING
BASED ON UNIT SURVEYS
OF AREAS UNDER PUBLIC MANAGEMENT
AS AT DECEMBER 31, 1970
Y U K O N
N.W.T.
PACIFIC OCEAN
ALBERTA
U.S.A.
Watson Lake
Lower Post
Cassiar
Atlin
Skagway
Carcross
Tulsequah
Juneau
Telegraph Creek
Fort Nelson
Fort St. John
Dawson Creek
Chetwynd
Mackenzie
Pink Mountain
Stewart
Prince Rupert
Queen Charlotte
Ketchikan
Kitimat
Prince George
Quesnel
Williams Lake
Kamloops
Vernon
Nelson
Cranbrook
Kimberley
Revelstoke
Penticton
Kelowna
Vancouver
Victoria
Nanaimo
Port Alberni
Courtenay
Campbell River
Port Hardy
Port Alberni
Port Angeles
Bellingham
Spokane
Calgary
Banff
Lake Louise
Grande Prairie
Fort St. John
Dawson Creek
Pouce Coupe
Spirit River
Fort Nelson
Watson Lake
Dease Lake
Cassiar
Atlin
Tulsequah
Telegraph Creek


BRITISH COLUMBIA
DEPARTMENT OF LANDS, FORESTS, AND WATER RESOURCES
HONOURABLE R. G. WILLISTON, MINISTER
Scale
40 30 20 10 0 40 80 120 160 MILES
STATUS OF SUSTAINED-YIELD FORESTRY PROGRAMME
AS AT DECEMBER 31, 1970
PUBLIC SUSTAINED YIELD UNITS (P.S.Y.U.'s)
PUBLIC SUSTAINED YIELD UNITS
P.S.Y.U.'s Inside Pulpwood Harvesting Areas
P.H.A.
NO. 1 Prince George Pulp and Paper Limited
9. Big Valley
15. Carp
20. Crooked River
43. Naver
44. Nechako
52. Parsnip
71. Stuart Lake
77. Westlake
79. Willow River
NO. 2 Kamloops Pulp & Paper Co. Ltd.
1. Adams
5. Barriere
6. Barton Hill
11. Botanie
23. Eagle
45. Nehalliston
46. Nicola
47. Niskonlith
49. North Thompson
59. Raft
63. Salmon Arm
64. Shuswap
70. Spallumcheen
NO. 3 Northwood Pulp Limited
12. Bowron
37. Longworth
39. Monkman
55. Purden
61. Robson
NO. 4 Bulkley Valley Forest Industries Limited
4. Babine
13. Burns Lake
40. Morice
68. Smithers
NO. 5 Cariboo Pulp & Paper Company Limited
17. Cottonwood
42. Narcosli
58. Quesnel Lake
NO. 7 Intercontinental Pulp Compnay Ltd.
53. Peace
69. Takla
P.S.Y.U.'s Outside Pulpwood Harvesting Areas
2. Arrowhead
3. Ashnola
7. Bell-Irving
8. Big Bar
10. Blueberry
14. Canoe
16. Chilko
18. Cranbrook
19. Creston
21. Dean
22. Dewdney
24. Edgewood
25. Fernie
26. Finlay
29. Granby
30. Hecate
32. Kettle
33. Kinbasket
34. Kingcome
35. Lac la Hache
36. Lardeau
38. Moberly
41. Nakusp
48. Nootka
50. Okanagan
51. Ootsa
56. Quadra
57. Queen Charlotte
60. Rivers Inlet
62. Salmo
65. Similkameen
66. Skeena
67. Slocan
69. Soo
72. Stum
74. Upper Kootenay
75. Vancouver
76. Wapiti
78. Williams Lake
80. Windermere
81. Yalakom
SPECIAL SALE AREAS
27. Fort St. James (O-I-C 1888/65)
28. Furry Creek (O-I-C 3909/67)
31. Kamloops Region (O-I-C 1826/66)
54. Prince George (O-I-C 2811/62)
TREE FARM LICENCES
T.F.L. No.
1. Canadian Cellulose Company, Limited
2. Crown Zellerbach Canada Limited
3. Triangle-Pacific Forest Products Ltd.
5. Weldwood of Canada Limited
6. Rayonier Canada (B.C.) Limited
7. MacMillan, Bloedel Limited
8. Boundary Forest Products Ltd.
9. Crown Zellerbach Canada Limited
10. Timberland Development Co. Limited
12. Bendickson Logging Ltd.
13. Galloway Limber Company Ltd.
14. Crestbrook Forest Industries Ltd.
15. Oliver Sawmills Limited
16. Crown Zellerbach Canada Limited
17. British Columbia Forest Products Limited
18. Clearwater Timber Products Ltd.
19. Tahsis Company Ltd.
20. MacMillan, Bloedel Industries Ltd.
21. MacMillan, Bloedel Industries Ltd.
22. British Columbia Forest Products Limited
23. Canadian Cellulose Company, Limited
24. Rayonier Canada (B.C.) Limited
25. Rayonier Canada (B.C.) Limited
26. The Corporation of the District of Mission
27. British Columbia Forest Products Limited
30. Sinclair Spruce Lumber Company Ltd.
32. Crown Zellerbach Canada Limited
33. Federated Co-Operatives Limited
35. B.C. Interior Sawmills Ltd.
36. F. & R. Logging Co. Ltd.
37. Canadian Forest Products Ltd.
38. Empire Mills Limited
39. MacMillan, Bloedel Limited
41. Eurocan Pulp and Paper Co. Ltd.
MAJOR PARKS
1. Bowron Lake
2. Garibaldi
3. Glacier
4. Golden Ears
5. Hamber
6. Kokanee
7. Kootenay
8. Manning
9. Mount Revelstoke
10. Mount Robson
11. Monashee
12. Muncho Lake
13. Mount Seymour
14. Stone Mountain
15. Strathcona
16. Tweedsmuir
17. Wells Gray
18. Yoho
19. Cathedral
YUKON
N.W.T.
ALASKA
PACIFIC OCEAN
QUEEN CHARLOTTE SOUND
DIXON ENTRANCE
HECATE STRAIT
CROSS SOUND
PRINCE OF WALES I.
PRINCE RUPERT
DAWSON CREEK
FORT ST. JOHN
FORT NELSON
PRINCE GEORGE
KAMLOOPS
VANCOUVER
VICTORIA
NELSON
CRANBROOK
KIMBERLEY
KELOWNA
PENTICTON
KAMLOOPS
CALGARY
SPOKANE
BELLINGHAM
PORT ANGELES
U.S.A.

The growth and yield section constructed 129 zonal curves based on recompiled average lines in Zones 4, 5, 6, and 9. Included were curves for low site in Zone 2. Thirty local curves were prepared from data from the Botanie, Lardeau, Nicola, and Wapiti PSYU's. In addition, 15 diameter over-age curves were drawn for Lardeau and Wapiti PSYU's. The former curves provide mean annual increment and the latter average tree diameters for growth types at any stand age.

After consultation with interested users, work started on the compiling of stand-table information for all units surveyed in 1968 and 1969.

Approximately $19,000 was received from sale of 17,294 maps, reports, Xerox printed data, manuals, and *Forest Inventory Statistics* 1967.

A total of 22,077 maps was supplied to the Forest Service and other departments; while 23,827 reductions printed in the new 1860 Xerox were supplied to Forest Districts, other departments, and the public.

DEVELOPMENTS

In 1970 the forest land in 14 public sustained-yield units was placed under reserve and gazetted as the Ashnola, Babine, Burns Lake, Carp, Crooked River, Finlay, Granby, Morice, Nechako, Nehalliston, Ootsa, Similkameen, Smithers, and Stuart Lake Forests. Another 25 Forest Reserves are being processed.

Fixed-base 70-mm. photography studies continued. Photography was carried out in the Chehalis-Dixon Lake area of the Vancouver PSYU using black and white, false colour (infra-red), and colour negative films.

Inventory work scheduled for 1971 includes the Eagle, Longworth, Quesnel Lake, and Takla PSYU's, the proposed Sikanni PSYU and the proposed Dawson Creek SSA.

Decadent hemlock and cedar studies will continue in the Kinbasket PSYU, and exploratory work will start in the Nakusp-Slocan area. Northern work will take place in the Moberly-Dawson Creek area.

Permanent-remeasurable growth and yield work will continue in the Prince George Forest District.

It is planned to produce stand-table information for all future unit surveys.

The land-use planner will correlate pertinent information collected on each unit survey.

ALPINE FIR

research division

RESEARCH DIVISION

A detailed report on the research programme for 1970 will appear in the *Forest Research Review* compiled at the end of the fiscal year.

TREE-IMPROVEMENT STUDIES

The clone-bank area is being constantly expanded. To date, 157 acres have been cleared at the Cowichan Lake Experiment Station and a start has been made on a new area on the opposite side of the lake where 40 acres are now being logged.

In co-operation with the Reforestation Division, a start was made on collecting wind-pollinated seed from the Coast-Interior transition region of the Fraser Canyon and Pemberton areas. A high-elevation seed orchard is planned, using wind-pollinated material from the correct geographic and elevational range. Access and stands are both restricted, but selection is being practised where possible. The cone crop was "spotty" in 1970, but collections were made from 50 trees and the prospects are good for a crop in 1971, when it is hoped to complete the collection from a further 100 trees.

There were very few male and female strobili in the Cowichan Lake clone bank, so no crosses could be made. On the other hand, there were sufficient strobili on some of the inbreds established from seed, and 30 self- and cross-pollinations were made on 11 S_1 and S_2 inbreds. Successful crosses were made on two S_2 inbreds which had only been planted in 1965. Further interspecific crosses were made with the Asiatic *Pseudotsugæ* also established from seed, but no viable seed was produced.

The 19 test-sites, composed of intraspecific crosses and established on different locations on the Coast, were all checked for survival. In addition, the heights were measured on crosses on the five test-sites planted in 1968. In spite of browsing and disease, some of the crosses with Washington and Oregon pollen parents look extremely promising. Nine new test-sites have been selected and staked in readiness for some 33,000 1+1 seedlings from intraspecific crosses now growing in the nursery, which will be planted next spring.

Ten test-sites of a provenance study of coastal Douglas fir were planted in the spring of 1970. Phenological assessments involving flushing and bud set of 77 provenances were made at three test-sites which differ climatically. During the fall, 10 additional test-sites were prepared for planting in the spring of 1971.

Arcotal continues to be a promising deer repellent after three years' trial.

At the Red Rock Nursery and Research Centre a small laboratory is being developed where seed can be extracted, cleaned, and counted, germination tests made, and cold-storage facilities provided. An additional area has been prepared for a clone bank and a start has been made to provide access to a large annex on the west side of the Fraser River. In the nursery a large number of spruce and lodgepole pine half-sib seedlings are being grown for various investigations, and rootstock selected for subsequent grafting.

A picetum of 20 spruce species and 57 seed sources from throughout the world was planted near Chilliwack. A northern picetum will be established with 26 seed lots representing 12 species. These piceta are made possible through the co-operation of the Ontario Forest Service.

Cones and scions were collected from 138 trees selected in the Smithers and Burns Lake area, and over 600 grafts were made. Collections made in previous

years from Prince George and the East Kootenay were augmented by further collections of those that failed to survive grafting.

Many of the Prince George selections grafted two years ago have produced flowers—one female and one hermaphrodite were observed, the remainder were males.

The purpose of the range-wide assessment of genetic variation in lodgepole pine is to establish criteria for provenance transfer and to provide a sound basis for tree-breeding with this species. In continuing this study, preliminary morphometric analyses of cones and needles were completed, and, at Red Rock and Cowichan Lake nurseries, detailed observations were made weekly on the morphology and growth behaviour of 2+0 seedlings of 144 provenances and 147 wind-pollinated families. Seedlings from a pilot study of 30 provenances were transplanted and have since been lifted for planting out in field trials in the spring of 1971. Measures were also made on seedlings of 645 half-sib families which are being grown for breeding arboreta.

Thirty-one hundred rootstocks were potted to receive scions from 75 lodgepole pine plus trees from northern British Columbia and Yukon Territory. They are to be propagated in a clone bank at Red Rock. The plus trees were located by a faculty member and forestry students of the University of British Columbia, on behalf of the Svenska Cellulosa Company. Wind-pollinated seed from each tree has been cleaned for use in progeny trials.

SEEDLING PHYSIOLOGY STUDIES

Considerable effort has gone into organizing a new plant physiology nursery and greenhouse on North Road, Victoria. The controlled-environment chambers, laboratory facilities, and the greenhouse are in full production.

A start was made on a programme to find suitable selective herbicides for use on the Reforestation Division nurseries. Of four herbicides tried, Propazine at low rates gave excellent weed control with minimal seedling damage on both 1+0 and germinating seedlings. In some instances the release from weed competition gave better growth than periodic hand-weeding. The programme will continue with the testing of other herbicides.

A small trial has been conducted at the Surrey Nursery and a programme started using the controlled-environment chambers to study the factors affecting Interior spruce seed during stratification and germination, and the subsequent growth of the germinants.

A study is under way to map the variation of frost-hardiness in 2+0 Douglas fir over a yearly cycle. Some technical help has been given to the Reforestation Division's Vancouver Island nurseries in determining the degree of frost resistance of 1+0 seedlings for their frost protection programme.

SOIL CLASSIFICATION

The Forest Land Classification System has been approved as the formal mapping scheme for the forested lands of British Columbia. The mapping will provide the necessary framework for intensive forest management on both the tree-farm licences and public sustained-yield units.

A few experimental mappings with the above scheme have been jointly undertaken with the private companies on some tree-farm licences.

The principles of the mapping system have been outlined in the recent publication, *A Mapping and Interpretation System for the Forested Lands of British Columbia* (Research Note 54). A short course on the system was given in February for industry and British Columbia Forest Service personnel.

ECOLOGY

Progress in analysing vegetational data by methods related to numerical taxonomy has been slow because few investigators in this field have used large quantities of data, and the theoretical statistical and mathematical concepts have not yet been formalized.

Analysis of vegetational plots from the north central Interior extracted "noda" from the data. Noda are groups of plant species indicative of site conditions and forest productivity. Work is now directed to developing quantitative rather than presence/absence methods, with the possibility of increasing the predictive value of noda.

CANADA LAND INVENTORY

Representation on the Inter-Sector Analysis Committee of the Canada Land Inventory (ARDA) continued at four meetings held in 1970. Methods and procedures have developed to the state that Research Division's function in the committee's work consists now of observation rather than active participation.

DATA PROCESSING

The main concern during 1970 was the need to replace the IBM 1440 system located in the Vancouver Scaling Office. In the meantime, personnel have designed a system for IBM 360 and have flow-charted and coded five of the 52 programmes which will have to be rewritten.

No major programmes have been added to our library, but most have been updated to handle a wider variety of applications.

In addition to the processing of Forest Research experimental data, assistance was given to the Forest Inventory Division in developing a computerized height-diameter-curve fitting method, to the Management Division to evaluate the results of a scarification study, and to the Reforestation Division in various smaller applications.

SILVICULTURE

Vancouver

In May a survival count was made on the 15,000 mud-packed Douglas fir seedlings planted in 1969. Later in the fall a field assessment, consisting of survival count, total height, and 1970 growth, was carried out on the 34,000 seedlings planted in 1968 and 1969. Field data are now being checked and analysed for a final report.

Numerous plots, including trials of tree species on the west coast of Vancouver Island, were examined. Missing tags were replaced, established trees brushed, and invading natural regeneration weeded out.

Prince Rupert

Work was confined to an interim assessment of a number of previously established plantation and provenance trials. No new work was initiated.

Prince George

A number of plantations and provenance trials were re-examined and new ones established at Valemount, Prince George, Anzac Siding, and McLeod Lake.

Third and final years' planting of cold-stored and freshly lifted white spruce throughout the growing season was completed in the fall. The freshly lifted, early plantings are putting on much better growth than later plantings. Survival of all freshly lifted stock is excellent.

The final planting of container stock was completed during the summer. Preliminary results indicate a high mortality in most lodgepole pine treatments during the summer.

Kamloops

Container planting trials were continued, with reassessment of previous trials and establishment of new trials. On the average, containerized seedlings have not shown any better survival than bare-root stock.

Studies on the compatibility of conifer and grass seeding have failed to produce conclusive evidence regarding the effect of grass on tree establishment. However, there are some indications that seeding of even bunchgrass types has some inhibiting effects on conifer germination and survival.

Cost per survivor data collected to date shows only minor differences between spot-seeding by Panama seeder and conventional mattock-planting on difficult sites.

The continued increase in utilization of lodgepole pine has created large acreages requiring rehabilitative measures. An intensive programme of research will be required over the next few years to assist in the proper silvicultural management of this species.

Nelson

Several investigations on extending the planting in the spruce zone, using cold-stored bare-root stock, show a trend that planting can be continued up to six to eight weeks after an area becomes plantable in spring, and the resulting survival will be over 50 per cent. A hot, dry summer will reduce this period by about two weeks, and poor stock, resulting from poor storage conditions or bad handling, will reduce the period even more.

FOREST PRODUCTIVITY COMMITTEE

The Forest Productivity Committee is an intradivisional committee appointed by the Deputy Minister to provide guidelines and leadership in the field of growth and yield research related to the intensification of forest-management practices in British Columbia.

A major function of this committee is to channel research projects to a goal which will help the Forest Service determine future policy with respect to the size of allowable annual cuts.

The committee is now involved in the problem of estimating the additional increment from such silvicultural measures as fertilization, spacing, and thinning. It is intended that, with industry co-operation, there will be both operational scale trials and permanent plot experiments.

New sampling methods will have to be designed to estimate growth by successive enumerations. These data will form the basis for constructing local yield tables of managed stands.

A forest-land classification system will be used as an integral part in the planning and design of experiments and to indicate sampling strata.

Research in simulator models of forest stands and management units which employ the single-tree approach will be investigated to provide interim estimates of growth until accurate yield tables based on plot data are available.

The committee will also be concerned with benefit/cost ratios as criteria determining optimum silvicultural measures.

The various projects planned will be initiated by personnel from several divisions, including the Research Division, under the general direction of the Forest Productivity Committee.

LODGEPOLE PINE

reforestation division

REFORESTATION DIVISION

RECONNAISSANCE AND SURVEY WORK

In the past, some districts have been hampered in their planting programmes by a lack of sufficient plantable area. However, as a result of an aggressive site-preparation campaign in 1970 on the heels of a severe fire season, all districts now have adequate plantable area to accommodate an increased planting programme in the immediate future.

This is particularly significant in the Prince Rupert District, where the lack of suitable planting-sites had previously been a problem. District survey crews in 1970 examined 50,847 acres, of which 32,379 acres (63.6 per cent) were found to be understocked, and a further 3,770 acres found to be unplantable. Examination of an additional 40,720 acres, burned under prescription in the fall, indicated that further preparation will be required on only 6,094 acres before planting is possible.

Elsewhere in the Interior, regeneration surveys were confined mainly to sites disturbed prior to 1970. Some 25,000 acres were examined in the Kamloops District and just over half of this area was found to be inadequately stocked and suitable for planting. In the Prince George District, 30,142 acres were surveyed and more than 70 per cent was found to be adequately stocked, with only 4,762 acres requiring planting. One-third of the 1,865 acres surveyed in the Nelson District was found to be plantable.

On the lower Coast, Vancouver District crews were able to prepare planting prescriptions for 21,300 acres (68 per cent of 31,200 acres examined). Intensive surveys carried out on other cutover areas revealed that on the areas examined 6,537 acres are restocked and only 3,339 acres will be suitable for planting.

A number of examinations were made in specific areas throughout the Province to determine their suitability for direct seeding.

FOREST TREE SEED

While there was a generally good flower crop for most species in 1970, the resulting seed crop was disappointing. There was a great number of cones in evidence throughout the Province, but most often they contained no usable seed. The result was that field crews spent many days locating areas in which picking could be profitable. Insects, particularly the spiral cone borer (*Hylemya anthracina*) and the spruce seedworm (*Laspeyresia youngana*), were the major destructive agents, and populations were the highest yet recorded in many instances. Cone rust was also prevalent.

The coastal Douglas fir crop failed to develop, except in the transitional zone (Pemberton-Boston Bar-Hope), and the crop was severely decimated by insects. Fortunately, the best collectable crops occurred in the Prince Rupert District, where they were most needed, and in parts of the Prince George District. In the southern Interior, insect damage was evident earlier in the season and the problem was well defined before collections started. In the Nelson District, for example, no cones were collected at all, while in Kamloops collections were mainly Douglas fir, which did not seem to be as badly attacked as did spruce.

Summary of Cones Collected and Shipped to Duncan, 1970

Forest District	Species (Amounts in Bushels)					
	Douglas Fir	Sitka Spruce	Western Hemlock	Interior Spruce	Other	Total
Vancouver	714.0	------	-----	426.5	-----	1,140.5
Prince Rupert	22.5	533.0	54.5	3,178.5	-----	3,788.5
Prince George	222.5	------	-----	3,269.5	10.5	3,502.5
Kamloops	528.0	------	-----	257.5	3.0	788.5
Totals	1,487.0	533.0	54.5	7,132.0	13.5	9,220.0

Extraction of this collection commenced December 1 and was still under way at the end of the year.

A winter collection of lodgepole pine will continue into 1971, and to date some 2,500 bushels have been collected. This collection is being carried out with the co-operation of the Canadian Forestry Service. Pine collections completed last winter (1969/70) were processed at Duncan during the summer and yielded 541.185 kilograms (1,190 lb.) of seed.

Summary of Winter 1969/70 Pine Collections

Forest District	Bushels Extracted	Seed Yield	
		Kilograms	Kilograms/Bushel
Prince Rupert	2,309.5	154.400	0.067
Prince George	1,964.5	159.225	0.081
Kamloops	541.0	43.600	0.081
Nelson	2,081.5	183.960	0.088
Totals or averages	6,896.5	541.185	0.078

Three new seed-production areas were established in the Vancouver District, bringing the total plot area to 123.8 acres. While development work commenced at the new sites, some 7.5 tons of chemical fertilizer were applied to 19.6 acres of plots established in previous years. In the Prince George District, all seed-production areas were cleaned, remarked, and rethinned where necessary. SPA G-1, near Stone Creek, yielded some 95 bushels of spruce cones.

At the Campbell River Seed Orchard, controlled pollination was carried out earlier in the year on 36 grafts involving 21 clones. Cones which subsequently occurred for the first time in the grafted portion of the orchard produced about 1 pound of high-elevation seed, the end result of both the controlled pollination (mentioned above) and natural (wind) pollination. It is interesting to note that yields from the orchard averaged 25 filled seeds per cone compared to 15–20 filled seeds per cone in a normal Douglas fir stand.

An area of 18 acres adjacent to the new Campbell River Nursery was cleared for the site of the full-sib seedling orchard for high-elevation areas on Vancouver Island. A further 15 acres are available for future expansion. The old Snowdon Nursery site will be utilized for the north coast seed orchard; this will be a half-sib seedling orchard and the stock for it is now ready. Early in 1970, the Mainland high-elevation Douglas fir orchard was established at the Koksilah Nursery. Very little mortality was experienced on the 10-acre area, which now contains 1,100 trees from 56 different parents. A start on the development of the 3,000-acre

reserve for seed orchards near Prince George was made late in the year. This area will eventually contain breeding stock for Interior spruce and lodgepole pine genetic programmes as well as seed orchards for these species.

Special cone collections were made from 51 Douglas fir trees in the vicinity of Pemberton, Boston Bar, and Hope. This collection will provide the basis for a high-elevation seed orchard for the Dewdney PSYU. Further collections from approximately 50 more trees are required.

The amount of seed weighed and treated at the Duncan Seed Centre for sowing in 1970 amounted to 791.662 kilograms (1,740 lb.). In addition to this work, a total of 477 germination tests were completed (56 new, 346 retests, and 75 research tests). An electronic seed-counter purchased late in the year is proving an invaluable aid in this work. This unit not only reduces the time required in seed-testing and permits more efficient use of manpower, but is also necessary for genetic work. A total of 55 special requests involving 187 seed lots was processed. These requests involved seed for the container programme and seed for research purposes both at home and abroad. The bulk of seed in storage has now been recleaned over the gravity table — a step necessary with the change-over to mechanized-drill seeding in the nurseries. Because of this recleaning, seed inventories are lower than normal usage would indicate.

Tree seed in storage at the end of 1970 is equivalent to about 17½ tons:

Agency	Amount in Kilograms
British Columbia Forest Service	12,336.068
Companies	3,790.860
Total	16,126.928

FOREST NURSERIES

Once again, unfavorable weather conditions resulted in a considerable difference between actual seedling inventories and planned production. This situation was aggravated by the fact that facilities and personnel were already under the strain of expansion.

At the Red Rock Nursery, an open winter, strong winds, and a reversal in May-June weather patterns upset the germination of fall-sown (1969) spruce so seriously that the few seed-beds which did have germination had to be ploughed-in. Likewise, at Surrey, sowing in new fields, coupled with an early spring drought, resulted in very poor germination of fall-sown beds and these also had to be turned under. Consequently, the production of 52 million seedlings planned for 1972 is now expected to approximate only 38 million. However, this shortage may be made up in part by container-grown stock. During 1970, some 750,000 container seedlings were produced and in the fall about 330,000 of these were shipped. The balance is scheduled for planting in 1971. The success with Sitka spruce and Western hemlock in containers is particularly significant as these species are perhaps the most difficult to grow in conventional nursery seed-beds.

In spite of the set-backs caused by weather and other conditions, Forest Service nurseries were able to lift a record 35,497,700 seedlings during 1970, an increase of almost 7 million (24.5 per cent) over 1969; some of these are still in storage.

A total of 462,000 lineal feet (87.5 miles) of seed-bed was sown in 1970. Of the 107,250 feet sown in the fall of 1969, 57,000 feet had to be ploughed-in, as reported above. These sowings are scheduled to produce stock for planting in fall 1971 through fall 1972.

On September 12 a killing frost occurred generally throughout the Province. While the frost was forecast and steps were taken to protect the 1—0 stock, the severity of the frost was not anticipated. For the first time, 2-year-old seedlings at Duncan were damaged by frost and slight damage was done to 1—0 stock at both Surrey and Red Rock.

The lifting of 7 million seedlings at Surrey commenced in the fall of 1970. This represents the first crop from that nursery where development began just two years ago.

The construction of new facilities and the development of additional nursery space are an important part of the current nursery expansion programme. Cold-storage facilities are now capable of storing over 15 million seedlings. The sorting-room at Red Rock was completed in 1970, and various implement sheds, crew accommodation, storage buildings, and irrigation works were constructed there and elsewhere.

Almost 95 acres were fallowed during the year, and most of this acreage, being new fields at Campbell River, Chilliwack, and Red Rock, had to be reworked several times in order to remove rubbish and to be upgraded generally with levelling and drainage. Peat was applied to the fields scheduled for sowing in 1971. At Surrey, an additional 25 acres were prepared for seed-bed, bringing the total area available for sowing at all nurseries next year to 120 acres. A further 17 acres at Surrey were rough-cleared, and 11.5 acres of sod were turned-in. Ten acres were rough-cleared at Chilliwack Nursery in preparation for the transplanting in 1971.

PLANTING

Following a winter of less than average snow, early planting conditions in the spring were not favourable. Planting on some projects had to be postponed or suspended temporarily because of poor soil-moisture conditions. Indications were that a hot, dry summer and autumn similar to 1967 could be anticipated, and this proved to be the case in the southern Interior at least. However, rains toward the end of the summer improved conditions so that fall planting was able to proceed as scheduled.

Planting by all agencies totalled 33,931,100 trees on 85,336 acres. This is a new record, being some 32 per cent over the total trees planted in 1969. It is also significant that the proportion of trees planted by the Forest Service has been increasing steadily for the past two years, from 29.5 per cent of the total in 1968 to 37 per cent last year and to 42 per cent in 1970. The total of 14,403,000 trees planted by Forest Service this year was almost equally divided between the Coast and the Interior (Appendix Table 22).

Included in the Forest Service planting are some 80,000 container-grown seedlings which were set out in special plots as part of the continuing experimental programme to determine the applicability and performance of these new stock types. Initial trials with the most recent idea of growing seedling plugs in a moulded styrofoam block were carried out with the main objective of comparing these with the earlier bullet, bullet-plug, and bare-root stock types. Conclusive results will not be available for at least two years, but it is planned to continue the trials on an expanded scale next year. The plots established over the past two years involving the use of the bullet and bullet-plug seedlings were re-examined, and preliminary results indicate this type of container stock compares favourably with bare-root stock in terms of survival and initial growth. This series of trials will be reviewed periodically as are other trials to observe results over the long term.

Acceptance of Forest Service planting contracts by private planting agencies was most gratifying during the past year. Approximately 3,905,000 trees were planted by contractors on Crown lands in 1970, and interest in this type of arrangement is increasing, as evidenced by the number of bids which were received. Three small contracts in the Interior were cancelled after commencement, owing to the early arrival of winter. Twenty-four contracts to plant a total of 3,125,000 trees have been advertised for the spring of 1971, and additional direct planting agreements are being considered.

The first, but small, company planting on a timber sale harvesting licence was completed in the fall, and it is anticipated that timber sale harvesting licensees will be increasingly involved in the future reforestation programme. Seven licensees have requested sowings totalling 3,635,000 trees for planting in 1973.

In connection with the 1970 planting programme, field crews established a total of 5,761 survival sample plots. An additional 3,305 sample plots in earlier plantations were also re-examined. Recent plantings of lodgepole pine have been encouraging in terms of survival and growth, and the amount of that species has been increased in the current scheduled sowings for all districts.

Trials were established this year to determine the possibility of planting bare-root stock throughout the growing season. Planting of spruce and lodgepole pine on a semioperational scale was carried out in the northern Interior at weekly intervals, commencing in mid-July and ending in mid-September. These trials utilized regular 2—0 stock lifted weekly at the Red Rock Nursery and shipped to the planting areas with a minimum of storage. Initial results are variable, but high survival appears to depend mainly on the length of time and the degree of handling between lifting and planting. Further trials are planned for 1971.

CO-OPERATION

The expanding container seedling programme continues to require a high degree of collaboration, particularly between the two main participants—the Canadian Forestry Service and the British Columbia Forest Service. Consultation on design and arrangements for the fabrication of special equipment played an important part in this year's success. The importance of close co-operation during the critical periods of sowing, germination, and the need for discussions and agreement on nutrient schedules and unforeseen problems cannot be overemphasized. While new facilities at the Duncan Nursery were used for the stock to be used in Coast production trials, the Interior seedlings and Coast hemlock stock for genetic trials were grown at the Burnside Road laboratory. This programme is financed jointly by the two Services.

Entomologists on the Burnside laboratory staff also provided a valuable service in connection with the assessment of cone seed insect populations late in the year. This assistance enabled Forest Service crews to define the presence of insects and to estimate the extent and significance of damage.

Co-operative activities with industry also continued during the year. Companies and other agencies took an active part in the out-planting trials with container stock. These are to be continued in 1971. Some 34,000 seedlings of genetic significance were grown in bullets for co-operators of the Tree Improvement Board and were transplanted into "Fertil-pots." These will be available for field planting in spring 1971. Overwintering in the bullets last year and subsequent mortality in the transplants indicates some of the genetic crosses involved may not be particularly suited to transplanting.

On another project, the Forest Service co-operated with several companies in a trial to determine the effects of transpiration retardants. Initial results are inconclusive and further work is expected to be completed next year. Similar work is under way with browsing repellants.

A co-operative study with the Western Forest Tree Seed Council into the germination of Abies species was initiated at the Duncan Seed Centre, and will be continued in 1971.

Visitors to the various nurseries continue to occupy a considerable portion of the nurserymen's time. For example, Red Rock recorded each visit during the past year and tallied 350 individuals who came, either singly or in groups, to tour the nursery. In addition, a total of 284 persons attended in-service training sessions sponsored by the Forest Service and held in the conference room. At Duncan the nursery staff conducted seven major tours in addition to smaller local groups.

INTERDEPARTMENTAL FORESTRY AND CORRECTIONS CAMP PROGRAMME

This co-operative programme continues to provide significant benefits to both departments. In 1970 there was a general increase in the population of the forest camps. The continual improvement in work habits reflects the effort put into training of the officers and, in turn, their guidance of the work crews in the field. In many cases the performance of the inmate crews was equal to that of crews hired from the outside.

Once again the majority of the work done by inmates was in nursery development and operation, including clearing, fencing, drainage, seed-bed preparation, transplanting, and lifting. At coastal nurseries, inmate crews lifted over 7 million trees, which represents about 20 per cent of the year's total lift. Residents of the Alouette River Unit, using transplant machines, transplanted over 2 million trees—almost one-quarter of the total transplanting programme in 1970.

Other reforestation accomplishments by the various camps include the planting of 362,000 trees, site preparation of 1,640 acres, and stand improvement (thinning and cleaning) work on 136 acres.

Salvage-logging operations conducted by inmate crews provided the material for a variety of wood products used on these and other forest projects. Sawmills located near Hutda Lake, Alouette Lake, Chilliwack Valley, and Sayward produced lumber for buildings, bridges, and wharves, while other camps produced shakes, plot stakes, and posts for fencing projects. Crews under the direction of trained officers took action on 34 forest fires (a record of 25 fires in the Kamloops District alone), with excellent results, and when not on the fire-lines these men maintained trails and serviced campgrounds.

The establishment of two detached camps, one at Blue Mountain near Haney, the other at Sullivan Valley near Kamloops, is indicative of the versatility of the programme and the success being achieved in the rehabilitation of these men.

MOUNTAIN ASH

information division

INFORMATION DIVISION

For the Information Division, 1970 was a year of expanded operations as the Forest Service adopted new policies and responsibilities. Chief among these was the decision to include aspects of recreation in forest-management plans, and this served to inaugurate a combined information/public relations programme destined to reach significant proportions in the near future.

In addition to the production of normal news releases for all media, the Division also distributed a number of special feature articles to the press, trade journals, and other publications. Several "guest editorials" were prepared for release by the Minister and Deputy Minister. Several service publications were rewritten and updated.

The year also saw the Division become deeply involved with the production and presentation of numerous television shows. This included a series of 17 half-hour Forest Service programmes broadcast by Victoria's education-information Cable 10-TV, commencing in early November. By year's end, arrangements had been completed for a similar series of 13 half-hour programmes to be broadcast early in 1971 by the Cable 10-TV outlet in Vancouver.

A close liaison was continued with other forest agencies, industry, and foresters' organizations. The Division was also active with a number of special displays in which the sustained-yield policy was the central theme.

PHOTOGRAPHY

For the first time in several years, total production was down, but there was an increase in colour-photography production.

Due to economy measures and lack of staff facilities, copies of file prints were not made for the forest districts, accounting for the drop in black-and-white production.

The section produced 9,315 prints, 1,810 in colour. News releases again accounted for a high proportion of prints.

The slide library was improved, with more than 3,000 duplicated and placed in visisheets, under subject listing. During the year, 760 slides were added to the library.

A total of 262 black-and-white and 520 colour negatives was added to the photo library.

Slide production and duplication were a major portion of the section's work. A total of 6,237 duplicates was made, including those for the slide file. The slide show *Clearing the Peace* was completed and sound-taped; 12 copies of the 80-slide show were made. Work is nearly complete on a Management Division slide show covering the history of sustained yield in British Columbia.

Major assignments included continued coverage of the Mica pondage clearing, fire-fighting in the Vancouver and Kamloops Districts, Ootsa Lake salvage operation, and planting in the Kispiox area. The requirement for X-ray processing by Research Division was down and only 1,410 70-mm. film positives were produced, approximately 50 per cent of the 1969 total.

MOTION PICTURES

No major motion-picture production was undertaken during 1970. A total of 2,700 feet of colour film was shot. Demonstrations of the A-26 air-tanker and the

use of helicopters for gathering tree samples were covered. Film was obtained of women planters in the Kispiox area and the Ootsa Lake salvage operation, and used on educational television programmes. Coverage was given to the Mica pondage clearing, and air footage of tanker drops was taken for the Kamloops District for use in the tanker pilot-training programme.

Two 25-second fire-prevention clips were updated and sounded. These were distributed to all British Columbia television stations. One training film, shot in 1968, was edited and sounded. Called *Bucking Facts,* it deals with the use of the chain-saw for clearing windfalls.

LIBRARY

Librarian Miss Enid Lemon visited the Training School to help organize material available for students taking the ranger courses.

The mailing-list for the monthly Accession List has passed the 400 mark and requests for material have increased considerably.

Lack of space in the library is drastic and it is practically impossible to order any more textbooks.

FILM LIBRARY

Throughout 1970 the Forest Service film library issued 2,134 films on loan, and they were seen by a combined adult and student audience of 301,520. These figures compare with 1,065 loans and 252,428 viewers the previous year. This increase is attributed to more-efficient booking procedures instigated early in 1970.

The films were used by a wide variety of organizations in Canada and the United States, and included Forest Service personnel, universities, technical schools, service clubs, and schools of all grade levels.

It was difficult to find appropriate films for inclusion in the library. Twenty-three films from outside sources were previewed, and only two were selected. Fourteen films were added to the library during 1970, of which 12 were Forest Service productions.

DISPLAYS

Forest Service displays were used in six locations—Parent-Teacher Federation Conference, New Westminster; Career Expositions in Courtenay and Penticton; trade fair, Quesnel; Sam Steele Days, Cranbrook; and Western Forestry and Conservation Association Conference in Vancouver. There are still permanent displays at the Pacific National Exhibition.

Some 22,750 people visited the Forest Service lookout tower during the 1970 PNE.

Panels from the Festival of Logging display at the PNE were made into a self-supporting unit.

EDUCATION

Twenty additional school libraries, including two regional college libraries, were provided with Forest Service information material. Individual requests from teachers continued to increase, as did those from students and various youth organizations.

The Information Division assisted in the development of the Cowichan Valley Forest Museum as an outdoor classroom. Initially, this will be used by elementary schools in the Duncan area and will be extended to other school districts as required.

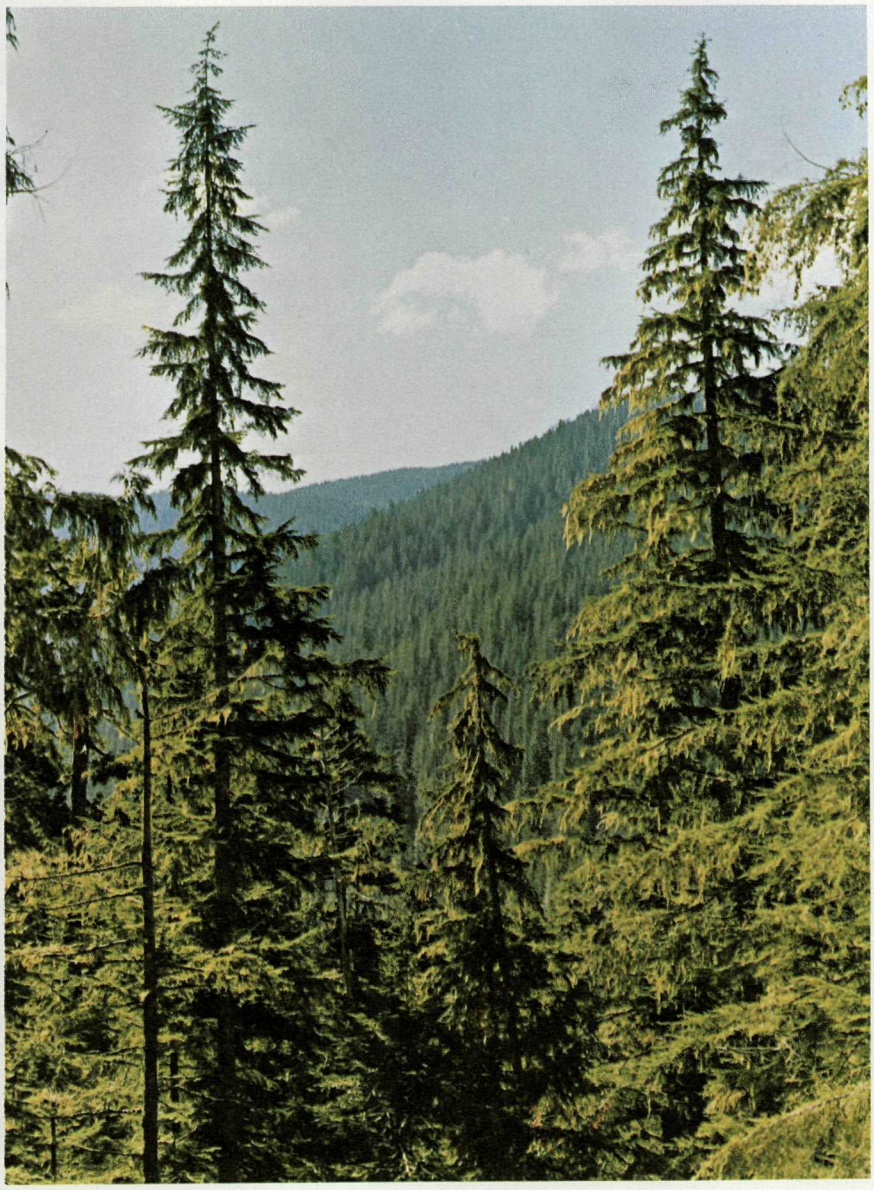
Tours of Victoria headquarters and the Green Timbers Nursery, as well as lectures and information talks, were conducted by personnel of the information staff where time permitted.

SIGNS

New designs for Ranger Station and plantation signs were completed and prototypes were installed in selected areas. Panels, using the new Forest Service identification symbol for updating the old-style ranger signs, were designed and field tested. These should be ready for distribution early in 1971.

FOREST SERVICE MUSEUM

Honorary Curator D. E. Adderley collected a large number of interesting artifacts for the museum during the year, many coming from the Nanaimo Ranger Station, which was closed late in 1970.



WESTERN HEMLOCK

management division

MANAGEMENT DIVISION

Poor market conditions in the second half of 1969 continued through 1970. Tight-money policies and high interest rates were blamed for the generally low prices and demand for lumber. In an attempt to maintain net returns, industry concentrated on production of higher grades, and this contributed to the increased scale for the Province as a whole. The poor lumber market also resulted in substantial increases in log exports, both from exportable and nonexportable lands. The total scale of all products in 1970 was 1,932,628,437 cubic feet, an increase of 2.2 per cent over 1969.

For the second consecutive year, the Vancouver Forest District recorded a slight decrease in production. This was again offset by a substantial increase in the Coast portion of the Prince Rupert District to give an over-all increase for the Coast. In the Interior, the Prince Rupert and Nelson scaled production was off, but increases in the Kamloops and Prince George Districts resulted in an increase for the Interior as a whole.

Timber sale harvesting licences played a prominent role in the year's management activity, and the number awarded now stands at 184. These licences account for a total allowable annual cut of 4,423,850 cunits. The move to close utilization continued throughout the year, despite the poor market conditions. The number of mills with chippers now stands at 230, and there are 202 barkers. This is a smaller increase than the previous year, but this is attributed to some degree to a consolidation of manufacturing plants.

In an attempt to control the spruce bark beetle epidemic of 1968/69 in the Cranbrook-Fernie area, and to recover as much volume as possible from the killed trees, a crash programme of cruising was undertaken early in the year. Sales were auctioned quickly and cutting permits issued on existing timber sales. Results have been mixed. Salvage operations have been excellent in some areas and poor in others. The poor lumber market had some bearing.

December 31, 1970 saw the end of a five-year cut-control period for the established licensees in many of the public sustained-yield units. On the whole, the results have been very satisfactory, with the majority of operators falling within the confines of 10 per cent, more or less, of the sum of their five-year allowable annual cuts. A number of operators found themselves below the minimum requirements, partially as a result of the poor market. (The logging industry was advised there would be no reduction in individual allowable annual cuts.)

A successful pilot operation late in 1969 led to the award of a licence for the recovery of flood-killed timber in Ootsa Lake. It was found the wood in that portion of a tree more than 10 feet below the surface of the water was sound. The licensee has developed a self-propelled barge from which a set of hydraulically operated tree-shears is let down the trunk of the trees. A mechanical arm lifts the whole tree onto a cradle on the side of the barge, and, when it is full, the trees are bundled and dumped into the water. The tops are left on the trees for buoyancy.

MARKET PRICES AND STUMPAGE TRENDS

Lumber prices were depressed throughout 1970, and stumpage rates continued the decline that began with the market break in mid-1969.

The average price bid for Crown timber was $4.28 per 100 cubic feet, which compares with $9.02 in 1969 and the averages for the years 1964–68, inclusive,

when stumpage rates were $4.09, $4.20, $4.25, $3.21, and $6.26 respectively per 100 cubic feet.

Stumpage rates in the Interior are tied directly to the average market price for dressed lumber. Consequently, the drop in price in the Interior was sharper than for the Coast, where stumpage rates are tied to prices that develop in a log market which maintained a level of demand that did not fully reflect the impact of the break in the lumber market.

The weighted average price per 100 cubic feet for licences sold in the Interior fell from $8.84 in 1969 to $3.02 in 1970, and the comparable average price on the Coast fell from $9.60 to $8.15.

The average stumpage price detail shown in Appendix Table 63 includes the volume sold at "salvage value only" rates, plus the volumes included in close-utilization licences and cutting permits at a standard 55 cents per 100 cubic feet. The average stumpage price per 100 cubic feet for all species, excluding close utilization and salvage wood, was $8.87 on the Coast, down from $10.20 in 1969; and $3.98 in the Interior, down from $11.20 in 1969.

STUMPAGE ADJUSTMENTS

As a result of the decline in average market values, there were 11,691 downward adjustments in the stumpage rates payable for timber cut on cutting permits and timber sales.

SUSTAINED-YIELD PROGRAMME

Public Sustained-yield Units

As indicated by Table 50, the number of public sustained-yield units in the Province increased to 78 with the designation of the Kamloops Region Special Sale Area as a sustained-yield unit in July 1970.

With progress in the installation of close-utilization facilities in sawmills and other wood-conversion plants and in the conversion of harvesting operations to close utilization, approval has been given to distribution of the uncommitted portion of the close-utilization allowable annual cut in 27 additional public sustained-yield units, increasing to 36 the number of units in the Province in which such distribution has been approved.

It has been recognized that some licensees will not be in a position to convert operations to full close-utilization standard immediately and that conversion may be hindered by the difficulty of marketing some products during present weak market conditions. It may take two years from the date of approval of the distribution to reach the full close-utilization cut in these units. In accordance with this revised cut allotment, the annual cut figures in Table 50 have been amended to show the close-utilization allowable annual cut for all units. They cannot be related to figures in this column in tables for previous years. It should also be noted the unit of volume measure has been changed to the "cunit" (100 cu. ft.) in place of the former unit of 1,000 cubic feet.

Thirteen additional public sustained-yield units were designated as Provincial Forest Reserves during 1970, increasing the number of sustained-yield units given Forest Reserve status to 26. Five of these units were previously designated as pulp-harvesting forests and their revised status has reduced the number of pulp-harvesting forests to eight.

CERTIFIED TREE FARMS

Three additional tree farms were certified during 1970, one being within Tree-farm Licence 36 and two being outside tree-farm licences. These additions, together with revisions to existing tree farms, have resulted in an increase in tree-farm area, but only a slight increase in the productive capacity, as indicated by Table 48.

FARM WOOD-LOT LICENCES

Three farm wood-lot licences were cancelled during 1970 on sale of the farms owned by the licensees, thus reducing the number of licences in the Province to 40, as indicated by Table 49. Management plans were prepared for four new farm wood-lot licences in the vicinity of Quesnel in the Prince George-Quesnel Special Sale Area, and these licences will be issued early in 1971.

WORKING PLANS

Until recent years the forest industry in effect was in a pioneering stage. Today it is well established throughout most of the Province, with production reaching toward the total allowable annual cut in many areas. Orderly development and management cannot be achieved without a plan, and it is the Forest Service's objective to compile a working plan for each public sustained-yield unit in the Province.

Basic plans for a number of the units have been completed and work is progressing on others. While the logging industry has been expanding and intensifying its operations, other uses of the forest have also been increasing. These uses cannot and must not be overlooked. The working plan must be a plan for integrated use. To this end, other resource agencies are invited to prepare sections covering their aspects of resource management within the units.

The work of compiling a working plan is carried out by the District Forester's staff, under the guidance and assistance of the Working Plans Section of the Management Division.

TREE-FARM LICENCES

The amalgamation of Tree-farm Licences 1 and 40 was completed January 1, 1970, reducing the number of tree-farm licences to 34.

During the year, three new working plans were submitted and reviewed. They provide for a greater integrated use, with policies and procedures being developed for recreation, stream pollution, wildlife and fishery protection.

Following the first meeting of the 29th Session of the Legislature, recommendations of the Select Standing Committee on Forestry and Fisheries regarding administration of the "contractor clause" were adopted, and tree-farm licence holders were requested to submit amendments to the current working plans to provide for a planned contractor programme.

SILVICULTURE

The trend toward large clearcuts, particularly in the Interior, continues. With increasing interest in the environment, some concern has been expressed about the desirability of this trend. As a result, an investigation is being carried out to determine the impact of clearcutting on the management of the forests and quality of the environment.

The rehabilitation projects, located at the Blaeberry River and in the Noisy Creek drainage, continue. The Blaeberry River project has now been completed and the work in the Noisy Creek drainage should be completed in 1971. A final report on the project, embodying benefit-cost analysis, should be available in 1972.

SCALING

A combined Industry/Forest Service Scaling Investigatory Committee, with the Chief Forester as chairman, was appointed early in the year to review the units of measure in use and to explore means of encouraging wider adoption of weight-scaling in the Vancouver Forest District. As a result of the committee's recommendations, the firmwood cubic scale will become the only unit of measure on and after January 1, 1972. All board foot and lumber cubic scaling will have ceased by that date. Some policy changes were also adopted relative to weight-scaling procedures.

Conversion from manual scaling to weight-scaling continued, as illustrated by the number of weigh-scales in use.

Forest District	Number of Weigh Scales by December 31—				
	1966	*1967*	*1968*	*1969*	*1970*
Vancouver	1	5	5	4	6
Prince Rupert	1	8	10	16	20
Prince George	16	21	27	31	37
Kamloops	12	17	19	20	26
Nelson	3	4	20	20	22
Totals	40	55	81	91	111

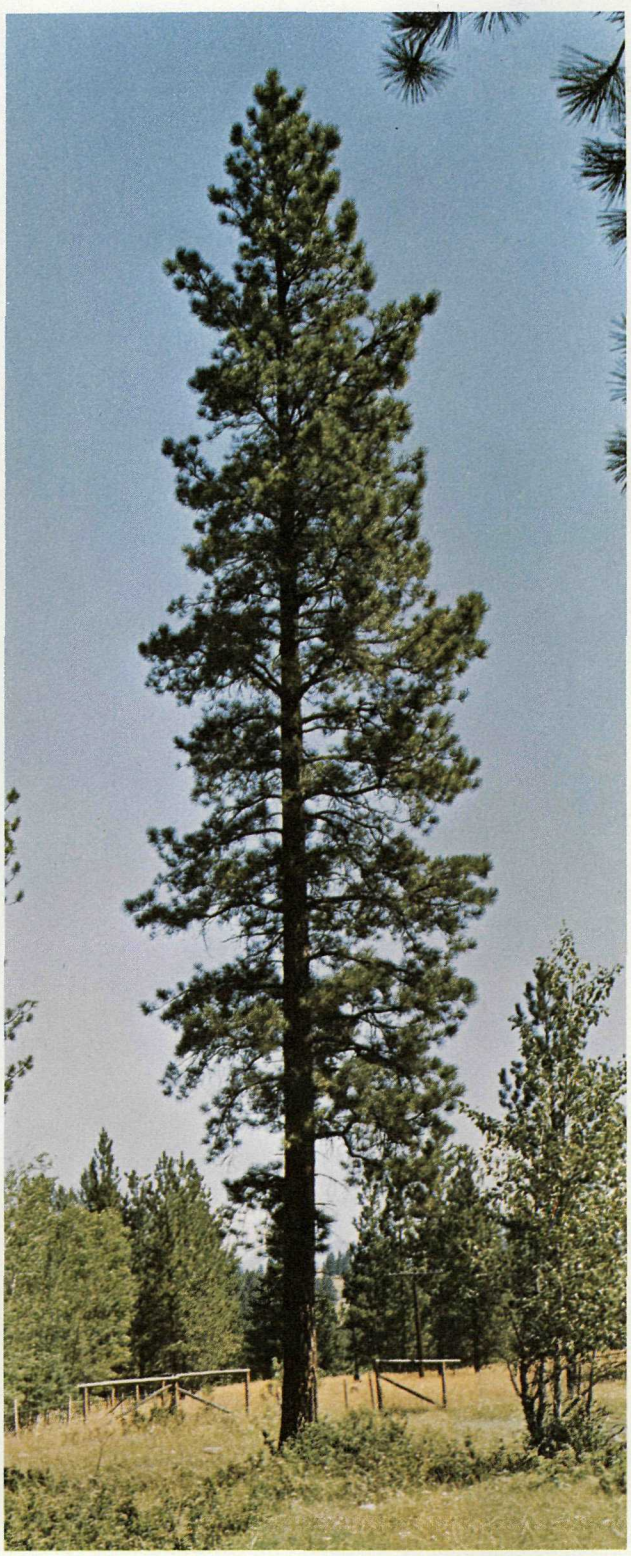
Fifty-four per cent of Prince Rupert's 1970 scale was weight-scaled. (This does not include 18 per cent of Prince Rupert's scaled production, which was barged unscaled to Vancouver and recorded as volume scaled in the latter district.) Weight-scaling accounted for 79 per cent of Prince George's 1970 scaled production, 58 per cent of Kamloops', and 64 per cent of Nelson's.

FOREST RECREATION

The Forest Service has now assumed responsibility for forest recreation on areas under its jurisdiction. To initiate this new phase, a forester was assigned to review and make recommendations regarding the scope of Forest Service involvement in this field.

The review was completed in September with a comprehensive report to the Chief Forester. A policy statement has been developed to guide staff activities.

Preliminary organization and planning phases were under way at year's end, and forest recreation activities are being incorporated within the multiple-use framework of Forest Service administration to the limit of available personnel and funds.



grazing division

PONDEROSA PINE

GRAZING DIVISION

GENERAL CONDITIONS

The winter of 1969/70 was generally mild and snowfall light throughout the range area. This, followed by a cool, dry spring, resulted in low soil-moisture reserves at the start of the growing season. Below-average rainfall occurred during the balance of the year, and forage production suffered accordingly on most ranges. Cattle came out of the winter in good condition, but in the driest areas gains in weights were below average. Cattle prices again increased, as did costs of operation. Many ranches are experiencing financial difficulties. Competing land uses continue to increase and are complicating range management.

Range

Crown ranges were ready at about the normal date. However, except for high-elevation ranges and more northern areas, forage production was poor. Grass-land ranges were most severely affected by drought conditions, some suffering damage which will take considerable time and careful management to repair. Dry conditions caused many stock-watering sources to dry up, which disrupted desirable live-stock distribution patterns. Range seedings undertaken in the fall of 1969 were adversely affected by the dry conditions, and seeding in 1970 was reduced for the same reason.

Toxic plants and predators took their toll of cattle in some areas, but on the average losses were no heavier than normal. Losses from hunting "accidents" appeared to increase. The drying-up of safe watering places forced stock to venture into boggy areas on some ranges, with resulting losses. Due to a shortage of water, and in some cases of feed, stock strayed from normal ranges. This, together with a particularly mild fall, made recovery of stock from ranges difficult. No serious live-stock disease problems were encountered on the range.

Hay

Hay production was above average in both quantity and quality on most irrigated land. However, irrigation water was in short supply in some areas, particularly from small streams tributory to the Fraser River. Production from nonirrigated lands was drastically reduced. Swamp meadows averaged normal yields. On the whole, hay supplies in the range area should be sufficient for the winter of 1970/71.

Markets and Prices

In spite of a drop in exports to the United States, the market for live stock remained strong, and all classes of cattle were readily disposable. Feeder-cattle prices were firm throughout the year at higher levels than in 1969. The weighted average price received by cattlemen through the B.C. Livestock Producers' Co-operative Association was $30.17 per hundredweight, compared to $27.35 in 1969 —a rise of $2.82.

RANGE AND PASTURE MANAGEMENT

Further attention was given to bringing periods of use in line with range maintenance or improvement requirements. Turn-out dates were adjusted in a number of areas. Rotation grazing was introduced on several range units, the type of rotation being tailored to meet requirements of both the range unit involved

and live stock. Improved management of this type requires considerable fencing, the cost of which has risen sharply in recent years. This, together with resistance to change on the part of some operators, is a factor limiting progress.

Effort was directed to the development of management plans designed to better integrate grazing by domestic stock with wildlife, recreation, and other rangeland uses. Improved plans were implemented in a number of areas, including the Bull River and Junction range units, where Bighorn sheep are important users of Crown range.

Pasture-development techniques were applied to several additional areas. However, practices such as clearing, breaking, and seeding are proving costly and many problems are being experienced. In many situations, more-extensive vegetation control methods, together with rotational grazing, will yield more economic returns.

Division officers continued to teach and promote improved range-management techniques through illustrated slide talks to range-user groups, field meetings, and other means. This endeavour was co-ordinated with the activities of the Department of Agriculture range-extension specialist. Division officers also participated in developing integrated Unit Management Plans for a number of forest units in the range area. They were also active in a number of land-capability studies, which resulted in additional areas being reserved from alienation for multi-use management.

Range Surveys

Range survey field work was undertaken on the D'Arcy Mountain, Allenby, and Nine Mile Units of the Princeton Stock Range. Intensive reconnaissances were made of the Cahoose and Clesspocket Units of the Anahim Stock Range and the Choelquiot Unit of the Chilcotin Stock Range. Maps and reports were completed for surveys undertaken earlier on the Big Creek Stock Range, the Green Lake Stock Range, and the Bedard and McLean Lake Units of the Ashcroft Stock Range.

The severe fire season drastically curtailed routine range inspections which are normally carried out by the Ranger staff.

Range and Pasture Improvements

During the year, $218,043 was spent from the Range Improvement Fund. Net assistance to the range-improvement programme from the Fund was $212,912, the balance representing an increase in the inventory of materials on hand at the end of the year. In addition, $20,000 was spent on pasture-development projects in the Peace River area from special funds provided for that purpose. Permittees also contributed extensively to the programme, mainly with labour and equipment. Costs continued to rise.

Structural improvements included 84 miles of trail and road, 91 miles of fencing, 43 water developments, 16 bridges and culverts, 36 cattle-guards, eight corrals, two breeding pastures, one horse pasture, and three enclosures for experimental studies or demonstration purposes. Routine maintenance was carried out on six buildings, 88 miles of fencing, 54 miles of trail and road, and 12 water developments, mainly within Peace River pastures.

A total of 5,195 acres was cleared of scrub trees and brush, 1,750 acres being treated by mechanical means and 3,445 acres by prescribed burns. Some 1,200 acres of the area cleared were cultivated and seeded. A total of 54,595 pounds of grass and legume seed was sown on denuded ground resulting from logging, other

industrial activity, or wild fire, and on sites especially cleared. The range-land drill was used to seed 175 acres, and 78,000 pounds of fertilizer were applied to 750 acres of improved pasture.

In co-operation with other departments, a concerted effort was made to control the invasion of knapweed into the East Kootenay Valley. Scattered patches of this weed totalling 221 acres were treated chemically. Erosion-control measures, involving the construction of earthen water bars and grass seeding, were undertaken on 400 acres in the Tatlayoko Lake area.

Miscellaneous improvements included removal of abandoned buildings, garbage, and other hazards and control of toxic plants. Control of beaver and predators in several areas was undertaken in close collaboration with the Fish and Wildlife Branch.

CO-OPERATION

Optimum use of range land can only be achieved by close liaison and co-operation between the various user-groups and administrative agencies. Close contact with research and educational institutions is also necessary.

Liaison with the live-stock industry is maintained through range live-stock associations. There were 63 such organizations recognized under the *Grazing Act* at the end of 1970, a reduction of four from the previous year. Recognition was withdrawn in three cases to permit amalgamation with adjacent groups, and in the fourth due to transfer of grazing administration in the West Creston area to the Creston Valley Wildlife Management Area Authority. During 1970, 160 live-stock association meetings were attended by Forest Service officers.

On subjects of industry-wide interest, contact was maintained with the British Columbia Beef Cattle Growers' Association. The British Columbia Livestock Producers' Co-operative, the producer-owned marketing agency, continued to supply the live-stock price figures necessary for calculating grazing fees under the sliding scale. The co-operative sold approximately 50.7 million pounds of beef animals from the range area during the year.

Numerous meetings with other agencies and user-groups were held in an effort to resolve use conflicts on range land. Some progress was made, and interagency co-operation reached a new high. However, excessive demands by single-use advocates, combined with sensational and inaccurate publicity in some cases, further complicated some problems.

Close contact was maintained with several Federal Department of Agriculture research stations in connection with range and pasture research projects. Division officers also participated in a number of seminars and in-service staff-training programmes and presented lectures at several technical and vocational schools.

ADMINISTRATION

Grazing use of Crown range was slightly reduced in 1970. However, a continuing increase in competing land uses added to the complexity of administration. A serious fire season curtailed routine range inspection, improvement supervision, and enforcement activities normally carried out by the Ranger staff.

During the year a minor amendment to the Grazing Regulations was made to eliminate an anomaly in the grazing-fee structure. A manual of administrative procedure was prepared and distributed. Policy regarding seeding of forest range was under review at the end of the year.

Active administration was extended to several new areas, notably the range used by guides' horses and wildlife in the Fort Nelson Ranger District. Administra-

tion of grazing use within the Creston Valley Wildlife Management Area was turned over to the Management Authority for the area at the beginning of the year. Problems resulting from the displacement of ranching units in the Libby Reservoir area occupied considerable staff time. Preliminary investigation of the possibility of contamination of domestic water supplies by stock using Crown range demanded much attention. This subject will require further study in depth.

Grazing and Hay Permits

During the year, 2,009 grazing permits were issued authorizing the depasturing of 178,332 cattle, 5,651 horses, and 2,739 sheep on Crown ranges. The number of permits issued was about the same as in 1969. The number of cattle is 2,247 less than in 1969. The number of horses is up slightly, and sheep continued to decline.

Expressed in animal-unit months, the equivalent of one mature cow on the range for one month, total use authorized for all classes of stock amounted to 822,442 animal-unit months, 14,963 less than the previous year.

A total of 195 hay-cutting permits was issued for the harvesting of 2,025 tons of meadow hay, approximately the same as the previous year.

Grazing Fees

Grazing fees are on a sliding scale related to prices received by producers the previous year. Except for cultivated pastures in the Peace River area, grazing fees per head per month were 55 cents for cattle, 68¾ cents for horses, and 13¾ cents for sheep, a considerable increase over the previous year. The separate scale of fees in effect for cultivated pastures in the Peace River area remained at $1 per head per month for cattle, $1.25 for horses, and 25 cents for sheep. The hay-cutting fee remained at $1 per ton.

Control and Enforcement

Procedures were changed during the year to permit field officers to deal more promptly with trespassing stock. More than the usual number of stock counts were made prior to turn-out. As usual, most stock-owners complied with the regulations and permit conditions, and inadvertant violations were promptly rectified in most cases. It was necessary for Forest Officers to seize and detain trespassing stock in 12 cases. One case was successfully prosecuted in Court.

engineering division

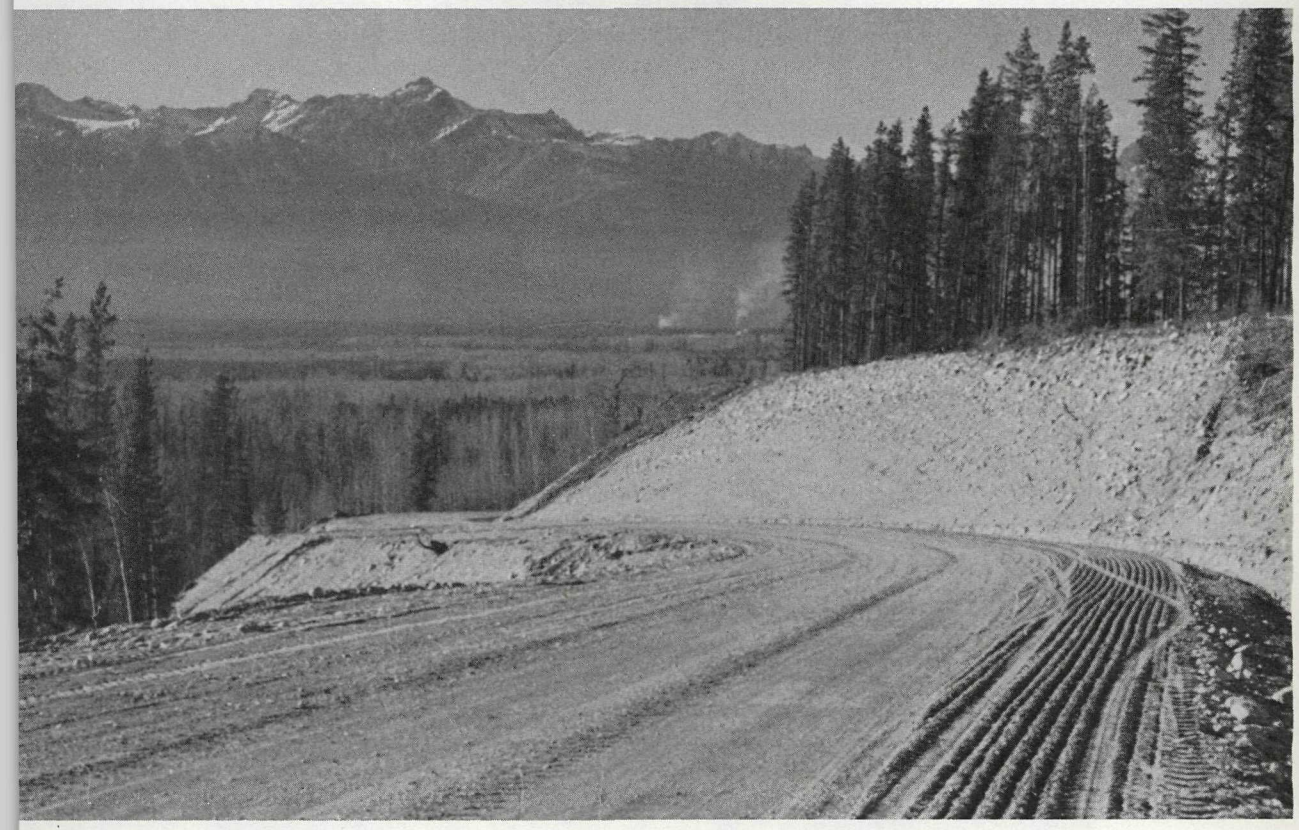
DOUGLAS FIR

ENGINEERING DIVISION

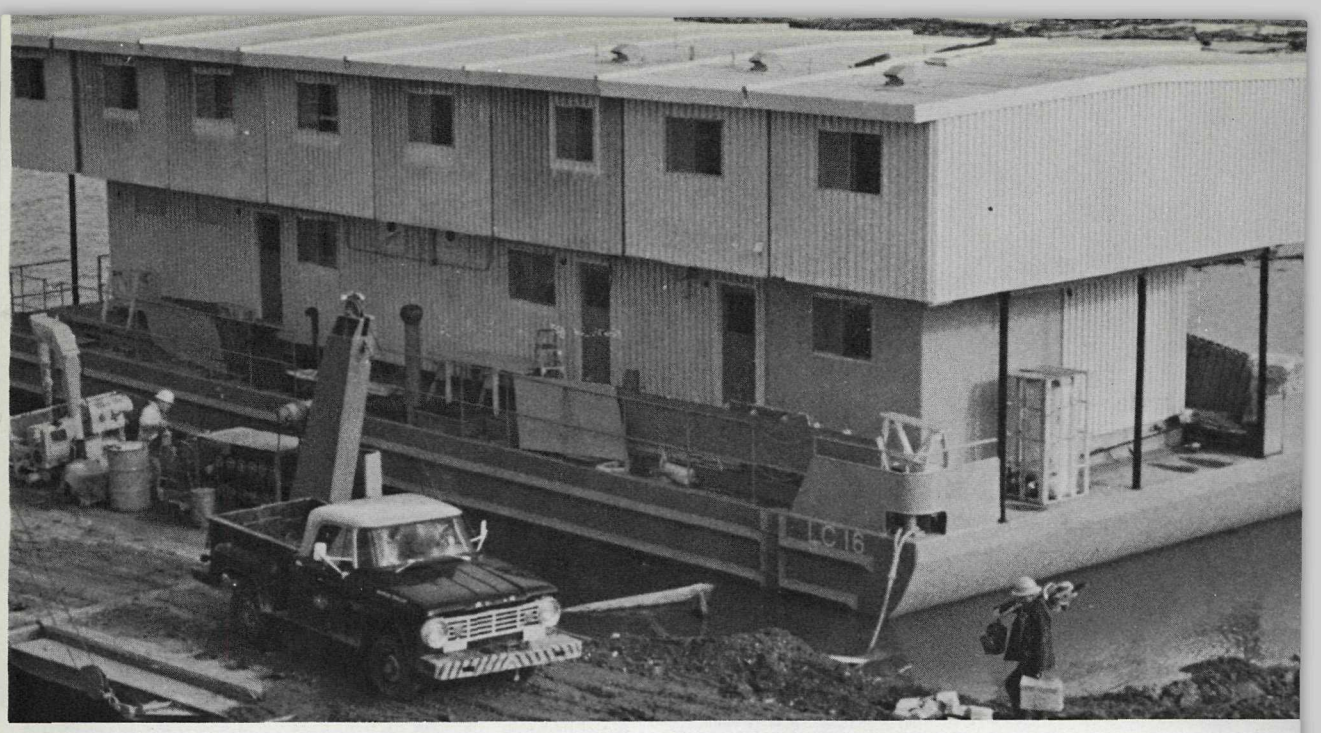
ENGINEERING SURVEYS

Field survey crews completed 150 miles of road location and surveys of several bridge-sites and nurseries.

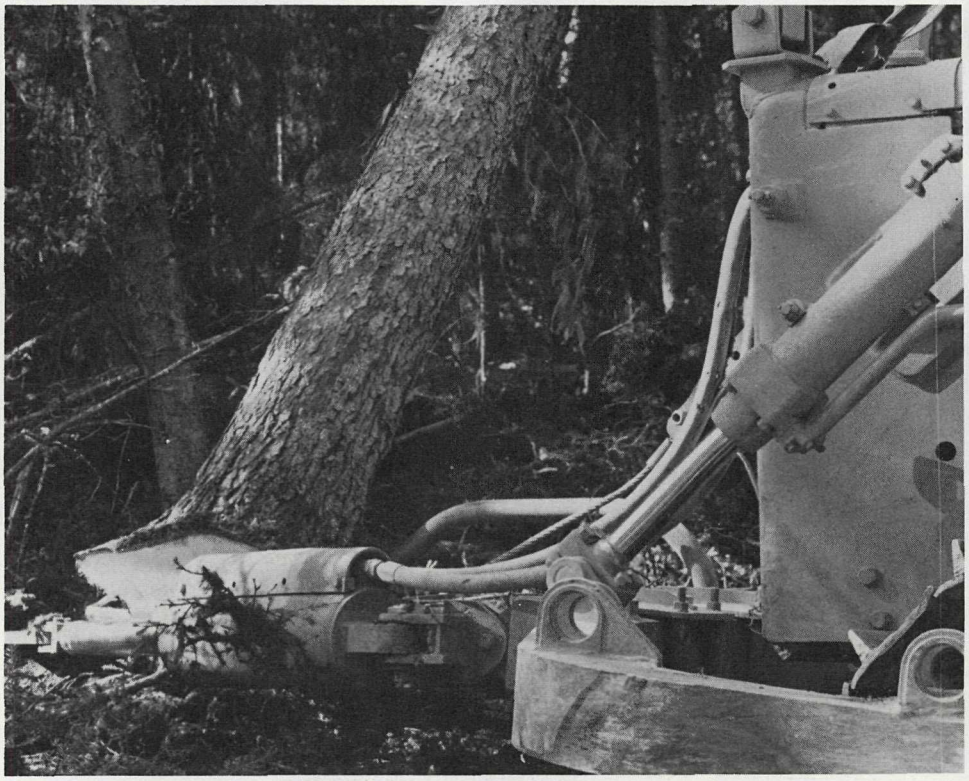
District field engineering included a development study of the Taku PSYU, access route studies in 29 PSYU's, 700 miles of road evaluations in tree-farm licences, timber sale harvesting licences, and public sustained-yield units, and continuing assistance on road reconnaissance in conjunction with timber sale cruising.



A section of the Canoe River Forest Road, south of Valemount, which has been relocated above the Mica Reservoir flood-level. Road will provide access to future lake from Valemount.



Unique floating camp for workers on Williston Lake features two tiers of prefabricated portable buildings on steel barge. Alongside (lower left) is steel barge used for transport of fuel and heavy equipment.



Tractor-mounted tree shears used in reservoir-clearing operations. Shears cut the trees close to ground level with a scissors action, and direction of fall is controlled by a wedging action of the cutting blade.

—Photos by British Columbia Forest Service

DESIGN

Designs, drawings, and specifications were prepared for four pressure-creosoted timber bridges—one for the Canoe River Road, two for the Stony Lake Road, and one for the Kispiox–Nass Road. The latter, to cross the Nass River, will be of an unusual trussed-girder type. Drawings were made for the reconstruction of six bridges on the Naver and Willow road systems, to allow loads to be increased from 45 to 140 tons, with reuse of most of the glulam and sawn timber.

Other design work included seven preliminary bridge sketches and estimates, several large culvert installations, load ratings of existing bridges, trailer snowsheds, and miscellaneous building foundations and structural checks.

MANAGEMENT ENGINEERING

Work continued in co-operation with other agencies on evaluating the 70-mm. fixed-airbase stereophotographic equipment for forest inventory sampling, studying the stability of rock bluffs along the Squamish Highway, counting spawning salmon in Campbell River, a slash-fuel study, balsam woolly aphid infestation estimates, and growth and yield studies.

Computer programmes were established or modified for the road recorder, roadway design, and forest-fire weather indices.

Several special studies and investigations were carried out—an inventory of floating wood on Lake Williston, a development study of the Narcosli PSYU, and a study on scarifying equipment. Methods of appraising for royalties from sale of natural resources such as gravel, sand, clay, peat, marl, shale, building-stone, etc., were reviewed. A survey was made of the volume of mill residue not presently utilized. Engineering staff assisted in preparing an evaluation of potential pulpable wood residues and in a study of log and debris salvage in the Strait of Georgia.

CONSTRUCTION

Road work included construction of 34.8 miles of new grade on the Bull River, Goat River, Kootenay Lake East, Canoe River, and Binta Lake Roads, and rehabilitation of 11 miles on the Binta Lake Road. Eight major bridges on the Naver Ahbau and Willow River road systems were rebuilt to carry off-highway industrial loadings of 140 tons. Permanent-type timber bridges were also erected over David Henry Creek and the Horsefly River. Maintenance was carried out on 840 miles of previously built road.

RESERVOIR IMPROVEMENTS

Clearing work on Lake Williston continued with the treatment of 17,100 acres in the Finlay River section and 6,700 acres in the Parsnip River section. The waterway-improvement programme on the Mica Reservoir continued with work on 17,000 acres along the Columbia River between Beavermouth and Boat Encampment, and 550 acres in the Canoe River section south of Valemount.

Site-preparation work on the Canadian portion of the Libby Reservoir continued with an additional 2,820 acres placed under treatment, and 2,870 acres of previously downed material burned.

BUILDING AND MARINE SERVICES

The major building project of 1970 was the seedling-sorting building now nearing completion at the Red Rock Research Centre. In addition, office buildings were erected at Fort St. John and Clearwater, the first stage of a greenhouse and

laboratory complex for the Research Division was completed in Saanich, and plans and specifications for other projects were prepared for the calling of tenders.

A transporter barge and a floating camp were designed, constructed, and placed in service on Lake Williston. Special-purpose fibreglass launches were provided for unusual operating conditions found on Stuart Lake, Stave Lake, and the waters adjacent to Bella Coola.

Two additional seedling refrigerator trailers and miscellaneous mobile accommodation units were purchased. The design of a mobile sewage-treatment plant for short-term camps was completed.

Material inspection and investigation duties were varied, and special studies were carried out in such fields as corrosion, sewage-treatment equipment, and fire extinguishers.

MECHANICAL

A review of the vehicle inventory indicates that light vehicles, consisting of sedans, station-wagons, panels, four-wheel-drive units (all types), and two-wheel-drive units up to 10,000 pounds gross vehicle weight (GVW), increased by 20 units. While sedans increased by only one, conventional station-wagons and panels decreased by seven. Four-wheel-drive crew-carrying wagons increased by three, and 4 x 4 pickups and panels, by five. Two-wheel-drive units of 5,000 to 10,000 pounds GVW increased significantly by 28.

Heavy-duty trucks of 14,000 to 50,000 pounds GVW increased by three, tanker units for fire crews remained at five. Heavy-duty units such as tractors and graders were unchanged.

An extremely serious fire season resulted in many fire-pump, chain-saw, and allied equipment purchases. Interest continued in snow toboggans in certain heavy snow areas, but the need for trail motor-cycles declined. Certain districts and divisions are interested in all-terrain vehicles (ATV's), which may be used to great advantage in muskeg or heavy snow areas.

FOREST SERVICE MAINTENANCE DEPOT

The efficiency of the depot was increased by installing electric overhead trolley hoists, an engine-test room, a grease ramp for heavy-transport trucks, more modern tools, and improved storage for hose-fittings. Heating systems were converted to natural gas, much of the storage yard was blacktopped, and fire-protection systems increased.

Marine work included overhaul and refit of 29 launches, three jet boats; and 76 launch and small-boat repairs. New engines and auxiliary equipment were installed in launches and "Deep V" runabouts. Launches were updated with radars, heating systems, hydraulic winches, and better safety equipment.

The depot made or assembled 500 signs; 80 furniture items; 40 Nash-type winches; five portable tankers; 3,000 hose, pump, and valve fittings; special purpose or utility trailers; fire-retardant mixers; screening-plant hoppers; and other articles. Couplings were installed on 220,000 feet of fire hose.

Maintenance and overhaul were carried out on 700 small mechanical units and 110 light trucks, transport trucks, graders, and tractors. Over 300 new, small mechanical units and 20 new trucks were tested and fitted out. Twenty trailers and portable buildings were rebuilt or repaired.

Transport and warehousing services entailed hauling 3,300 tons of materials and equipment, and towing 80 trailers and portable buildings. The trucks travelled over 200,000 miles and completed 200 assignments. The warehouse handled 1,000 shipments to and from projects.

COMMUNICATIONS

Of the 336 radios purchased, 103 replaced obsolete very high frequency (VHF) fire portables, and 11 replaced obsolete high frequency (HF) units. Thirty-five 3-channel, 15-watt mobiles, with quick interchangeability to ease mounting problems, were provided for vehicles using radio-controlled roads.

Remotely controlled base stations were installed in four Ranger Districts, and at Tabor Mountain for Prince George air operations. One VHF repeater was installed at Natal Lookout and one relocated from McLeod Lake to Chingee Lookout. To reduce overlapping coverage, the Sumas repeater was changed to one of the newly assigned frequency combinations. A voice-operated telephone control-patch with increased operational flexibility replaced Vancouver's obsolete headquarters remote-control system.

Service interruptions were reduced by modern transistorized equipment, but lightning and man-made interference affected HF propagation, causing some impairment to fire traffic.

protection division

WESTERN LARCH

PROTECTION DIVISION

WEATHER

The winter snowfall was below normal in most areas of the Province, and the early spring rainfall was light, with the month of June unusually dry. This resulted in the development of a serious fire situation in many areas. Early in July, repeated lightning storms started numerous fires. The lightning activity continued through August in the southern part of the Province.

Cooler, wetter weather developed in September, with drier weather in late September and early October. However, wetter conditions permitted termination of the fire season on October 15.

Lightning activity was above normal through most of the Province.

FIRES

Occurrence and Cause

The summer of 1970 produced a record number of 4,003 fires, compared with the 10-year average of 2,394. The previous record year was 1967, with 3,216 fires.

Lightning was again the largest single cause, starting over double the number of fires attributed to lightning over the past 10 years. On a percentage basis it was 45 per cent, as compared to 37 per cent.

While the percentage comparison for fires started by people shows a slight drop over the 10-year average, the actual number of fires attributed to people is almost double.

Cost of Fire-fighting

In addition to the Forest Service cost of $9,166,167, there was a cost of $2,240,070 to other parties involved in forest fire-fighting. The average cost per fire for 1970 was $2,290—double the 10-year average of $1,197. The Prince George District had one large and expensive fire in a well-timbered area in a remote section near Williston Lake. This one fire resulted in an extremely high average cost. The increased costs develop from higher fire-fighting rates of pay and increased costs in employing tractor equipment and aircraft.

Damage

An outstanding feature of the 1970 fire season was the relatively low acreage of burn for such a high-hazard year. The 260,958 acres of burn compares with the 10-year average of 263,437 acres. The damage value was in line with the area of burn, with the 1970 value slightly less than the 10-year average.

FIRE-SUPPRESSION CREWS

In the three southern forest districts, 13 suppression crews of five to 10 crewmen, plus foreman and cook, and 19 two-man crews were employed at strategic locations. Small initial-attack crews were also employed in the Prince Rupert and Prince George Districts. Suppression crews fought 672 fires .

During low-hazard periods, these crews were employed on other useful projects.

AIRCRAFT

Aircraft played a dominant role in protection operations throughout the 1970 season. Planes of all types were available as and when required, and with the many operators involved, they provided a high standard of service.

Six light aircraft were operated under contract for fire-spotting in the two northern districts and the Kamloops District. Patrol flying was provided to three districts by contract aircraft. The two northern districts found it expedient to hire aircraft as and where required.

Helicopters were readily available in most areas of the Province, except for the Lower Mainland. The Vancouver District found it necessary to contract one machine for the height of the fire season. The machines are used for a variety of tasks in addition to fire-suppression needs. The three-place piston-engine types and the light turbine-machines fill most of our needs.

Three amphibious Canso aircraft were supplied under contract as air-tankers carrying 800 gallons. Two bird-dog aircraft operated with these machines. Eight Avengers, carrying 500 gallons each, operated under a contract which included three bird-dog planes. A new contract supplied three Douglas A-26 air-tankers—each equipped to carry over 900 gallons. One bird-dog machine was included in this contract.

As the severity of the fire season increased, additional standby aircraft were called into service. The air-tanker action was particularly effective in "bombing" more than 820 fires with retardants. Two and one-half million gallons of long-term retardant mix, and one and three-quarter million gallons of short-term retardant mix were dropped.

ROADS AND TRAILS

The programme of road and trail construction progressed with continuing reconstruction of existing roads linking up Forest Service and logging-roads. The purpose is to improve access for protection and management.

SLASH DISPOSAL

Successful slash-burns were carried out in all five forest districts by both industrial operations and the Forest Service.

In the Vancouver District, 570 acres of slash were burned in February and March. No spring burning took place. Burning commenced again in early August in the northern section of the district. Due to the existing hazard build-up along the east coast of Vancouver Island, the Sunshine Coast, and the Fraser Valley areas, slash-burning was restricted until mid-October. The unusually dry fall permitted successful slash-burns until the first week in November. This resulted in a substantial reduction in the backlog of unburned slash, as well as leaving one of the lowest acreages of carry-over slash. Slash reports covered 67,636 acres of logged-over lands, of which 21,629 acres were exempted from burning. A total of 68,722 acres was burned successfully.

The Prince Rupert District experienced excellent slash-burning conditions, resulting in a great reduction of backlog areas which had been carried for several years. One of the worst areas of carry-over slash, in the Kitimat River valley, was successfully burned. This eliminated a potential disaster area if an accidental fire occurred during periods of high hazard. In the spring, 730 acres of slash were burned and a further 39,990 acres were burned in August and September. The Forest Service burned 9,089 acres, and industrial operations burned 31,631 acres. Slash reports

covered 32,292 acres of completed logging, of which 23,969 acres were instructed to burn and 8,323 acres were exempted.

The Prince George District had suitable slash burning weather in the spring when approximately 1,300 acres were burned. Continued drying in June precluded burning from then until mid-August. A total of 21,800 acres was burned, of which the Forest Service burned 7,000 acres and industrial operations burned 14,800 acres.

In the Kamloops District, the Forest Service burned 2,696 acres and industrial operations successfully burned 13,768 acres.

The Nelson District obtained excellent results. A total of 28,185 acres of logging slash was burned, of which 3,430 acres were burned by the Forest Service and industrial operations burned 24,755 acres.

SLASH-BURNING

The practical reasons for slash-burning are many and varied.

Such burning of branches, snags, unmerchantable logs, and all other unusable material left in the wake of a logging operation can be controlled, in both intensity and in area covered. Such operations are conducted by trained and fully qualified men of either the Forest Service or industry; and the burning takes place during relatively short periods in the early fall when proper weather conditions prevail.

If logged-over regions are not subjected to controlled burning, inevitably lightning, human carelessness or some other cause will ignite them — presenting far greater blazes, endangering surrounding timbered areas, and creating tremendously greater smoke problems.

Slash-burning also paves the way for faster, more efficient, and more effective reforestation measures. Seedlings can be planted easier and faster. They will grow quicker and straighter by not having to fight their way through a tangle of snags, branches, and other suffocating debris. The burning process also does much to eliminate insect hazards which could be extremely harmful to adjacent timber stands.

Meanwhile, with the ever-increasing trend toward fuller utilization of the whole tree, the need for slash-burning will be reduced proportionately.

SNAG DISPOSAL

In the Vancouver District, snags on 2,609 acres were felled—547 acres under contract and 2,062 by Forest Service crews.

FIRE-LAW ENFORCEMENT

There were 34 prosecutions for violating the *Forest Act*. Sixteen charges involved burning without a permit, nine for refusing to render assistance in fire-fighting, three for contravening Forest Use Restriction Orders, and the remainder for other varying offences.

FOREST-USE RESTRICTIONS

The long, dry spell in most parts of the Province resulted in several industrial forest-use restrictions and travel and recreation restrictions during the high-hazard periods of the fire season. Campfire permits were suspended in all districts. Details of restrictions follow:

Forest-use Closures, 1970

Area	Forest District	Type of Closure	Effective Date	Termination Date
Zone 8	Vancouver	Restricted industrial	June 25	July 25
Zones 1, 2, 6, 7, 8, 9, 10	Vancouver	Restricted industrial	July 13	July 25
Zones 1, 2, 7, 8, 9, 10	Vancouver	Travel and recreation	July 24	July 24
Whole district	Nelson	Travel and recreation	Aug. 27	Sept. 23

Suspension of Campfire Permits

Area	Forest District	Effective Date	Termination Date
Zone 8	Vancouver	June 25	June 29
Zones 1, 2, 6, 7, 8, 9, 10	Vancouver	July 13	July 25
Whole district	Vancouver	July 20	July 25
Zones 1, 2, 3	Prince Rupert	July 15	July 23
Zones 1, 2, 3, 4	Prince George	July 15	July 23
Whole district	Kamloops	July 10	July 26
Whole district	Nelson	July 17	July 26
Whole Province		Aug. 1	Sept. 3

PROTECTION PLANNING AND RESEARCH

Fire Statistics

New fire data overlays for the 1970–79 decade were prepared for the Provincial Fire Atlas base maps. Also in conjunction with the start of the new decade, the Fire Atlas was expanded to 290 base maps to provide complete Provincial base-map coverage at a scale of 2 miles to the inch. Fire statistics are coded for computer use in conjunction with the Fire Atlas.

All fire data from 1950 to 1969, inclusive, have now been coded, edit checked, and placed on magnetic tape. Much of our work can now be directed to computer-oriented studies. This was not previously possible.

Visibility Mapping and Lookout Photography

Field work in visibility mapping was de-emphasized this year pending an in-depth study into detection. One crew spent a short period in the field to combine lookout photography and visibility-mapping duties. Ten sets of photographs were taken and field examination of seven possible lookout-sites was completed.

Fuel-moisture Indicator Sticks

The fuel-moisture stick programme produced 1,575 sets of "hazard" sticks. Distribution records indicate the Forest Service used 43 per cent of the fuel-moisture sticks, industry 54 per cent, and the Canada Forestry Service 3 per cent.

A humidity chamber was constructed to make the production of sticks more efficient and to reduce the time spent at the Forest Products Laboratory in Vancouver.

Production of 1,700 sticks to meet 1971 requirements was started before the end of the year.

Insect Survey and Control

Liaison with other Provincial Government departments, Federal agencies, and joint Government/industry committees continued.

Protection Division represented the Forest Service on the new British Columbia Government Interdepartmental Pesticide Committee, and reviewed all plans for spray and chemical treatments for both Forest Service and industry projects.

Research Projects

Major research and development projects for 1970 were:

Handbooks—Three handbooks in the Forest Protection Handbook series were completed and distributed—*Forest Fire Suppression,* No. 3; *Proper Care*

and Use of Fire Weather Instruments, No. 4; and *Assembly and Operation Manual for the B.C.F.S. Fire Training Simulator,* No. 5.

Fire danger indices—The indices were further refined, operational procedures established, and the new Federal danger index system was introduced operationally on a Province-wide basis.

Detection—An in-depth analysis of the Provincial fire-detection system was started with the Vancouver District to be studied first. This will entail sophisticated operations research, and we were fortunate in enlisting the aid of a member of the Forest Fire Research Institute in Ottawa. This study will take two to three years to complete.

Sferics—The first step in a co-operative study on the development of equipment for lightning location and storm-track plotting has been taken with an electronics expert at Royal Roads College. It is hoped this can be expanded.

Fire-training simulators—All six portable simulators produced in 1969 were recalled for modification and returned to district use.

Canvas backpack tank—The Alberta Forest Service type of collapsible model was tested, approved, and 200 units manufactured and distributed.

Propane camp stove—A prototype propane camp stove of 20,000-B.T.U. capacity was developed for use singly or in tandam. Fifty units are being manufactured for 1971.

Helibucket—A 125-gallon fibreglass bucket was developed and tested. Further work will be required to make it operational.

Service and Co-operation

The districts were supplied with 576 two-man, two-day emergency fire-ration packs—bulk purchased and packaged for distribution in the spring.

Thirty Planning and Research Reports, covering a variety of protection projects, were published and distributed to field staff and outside protection agencies.

In co-operation with the Department of Transport, the Provincial fire-weather network was reassessed and 35 Class I and 42 Class II weather stations were selected for forecast and danger index purposes. Weather zones and forecast regions were also established.

The need for improved lightning forecasts was indicated in 1970, and the Department of Transport agreed to undertake a special study using improved weather parameters tied in with the newly taped fire data.

Considerable time was spent during the year collecting and consolidating all the data required by the Forest Fire Research Institute for their feasibility study of a Canada-wide mobile air-tanker fleet.

Liaison continued with other agencies in areas of mutual interest, including representation on various protection subcommittees of the National Research Council and on the Rehabilitation Committee of the Forest Service.

training school

DOGWOOD

TRAINING SCHOOL

The 10th basic trainees' class (Basic Course 10) of 24 men enrolled on January 7, 1970, and 23 men completed the course on March 17, 1970. One man voluntarily returned to his Forest District at mid-term.

The 16th class of advanced trainees (24 men) enrolled on September 16, 1970. They completed the first term on December 16, 1970, and commenced the second term January 4, 1971. Graduation date is April 8, 1971.

Subjects covered during the year were as follows:

BASIC COURSE 10 (SPRING 1970)

Subject	Days Allotted
Opening	½
Mathematics	2½
Surveying	6
Photogrammetry	3
Fire Suppression	14
Pre-suppression	7½
Forest Protection Policies and Procedures	4½
Forest Management Policies and Procedures	7
Mapping	1
Measurements	6½
Reforestation	1½
Silviculture	2½
Mechanical Equipment Maintenance and Operation	10
Exams	3
Spare	2
Closing	½
Total days	72

Physical Training, 45 minutes per day

ADVANCED COURSE 16 (FALL 1970)

Subject	Days Allotted
Business English	3½
Forest Protection Policies and Procedures	9
Botany	5
Dendrology	2
Grazing	3½
Entomology	3½
Pathology	4
Mathematics	2½
Silviculture	4
Research	3
Reforestation	3

Public Speaking	4
Surveying	6
Wood Technology	2½
Ranger District Organization	6
Opening and Spares	2½
Total days	64

Physical Training, 45 minutes per day

EXTRA COURSE AND FUNCTIONS

The following extra courses and functions were held at the school:

Course for Fieldmen of the Inventory Division—The school provided room, board, facilities, and minor assistance with instruction for this course. A total of 74 men attended the sessions during the period May 6 to 16, 1970, inclusive.

During the period May 17 to August 15 the dormitory was occupied by one 19-man inventory-sampling crew collecting data in the Pitt Lake, Haney, and Mission areas.

During the year the school's instructional facilities were used intermittently by the Vancouver scaling classes.

The Canadian Foresty Association conducted one week of outdoor classroom lectures. A total of 1,000 elementary students from the surrounding area attended.

The annual Technical Forest Officer 2 and 3 examinations were prepared and marked.

The reading course on the *Forest Act* was amended to date and 317 copies were distributed to the districts and divisions, along with 89 copies of the mathematics reading course.

During the peak period of the fire season the school's three instructors assisted in the Kamloops Forest District.

Remainder of the time was taken up with preparation of courses, administration, and maintenance.

ACKNOWLEDGMENTS

Appreciation is expressed to speakers and lecturers provided by the following agencies: F. J. Harper, St. John Ambulance; Mrs. J. E. Rebb, Queen Elizabeth High School; Department of Transport Weather Office, Vancouver; Department of Fisheries and Forestry, Canadian Forestry Service, Victoria; University of British Columbia Research Forest; Surveys and Mapping Branch, Department of Lands, Forests, and Water Resources; Okanagan Helicopters Limited; British Columbia Institute of Technology for the use of their fire simulator in our training programme; as well as lecturers from other divisions and districts of the Forest Service.

CONSTRUCTION

No new construction was undertaken during the year.

Enrolment at Forest Service Training School, 1970

Basic Course	24
Advanced Course	24

Graduates of Forest Service Training School, 1970

Basic Course	23
Advanced Course	*Nil*

Graduates of Forest Service Training School Since 1946

Basic Course	219
Advanced Course	319
Total	538

ENGELMAN SPRUCE

accounting division

ACCOUNTING DIVISION

Unfavourable market conditions for forest products prevailed throughout 1970, and severe labour problems affected the industry directly and indirectly. The combination of these factors resulted in a drastic decline in the financial return to the Forest Service, although the total volume of timber scaled increased by 2.2 per cent.

At the year's end, economic conditions had not improved significantly, but a lowering of prime interest rates in both the United States and Canada brought some hope of an upturn in 1971.

The total of amounts charged against logging operations declined from 1969 by 32.5 per cent to $62,296,745 (Appendix Table 142). All five Forest Districts suffered losses, the largest being 49.4 per cent in Prince George District, followed by Nelson (48 per cent), Kamloops (45.5 per cent), Prince Rupert (23.9 per cent), and Vancouver (14 per cent).

Direct forest revenue collected in 1970 dropped by 27.4 per cent to a total of $64,951,431 (Appendix Table 141). Timber sale stumpage at $53,524,665 recorded the sharpest decline, 31.6 per cent, followed by the related item of timber sale cruising and advertising, 23.6 per cent. Timber sale rental and fees remained almost unchanged, showing a minor gain of 1.8 per cent.

Timber royalties, the second-largest revenue category, decreased from the previous year for the first time since 1961, the total of $6,217,109 representing a reduction of 1.7 per cent.

Timber licence rentals and fees and timber berth rentals and fees registered decreases of 4.9 and 3.8 per cent respectively, probably as the result of continuing elimination of logged areas from these tenures. Timber lease rentals and fees increased by 2.6 per cent, possibly due to early payment of some charges not due until the new year.

Grazing permits and fees rose substantially to $438,003, a gain of 14 per cent, reflecting an increase in fees resulting from higher market prices being obtained for stock. Forest-protection tax was relatively steady, with a minor increase of 1.3 per cent. Miscellaneous collections increased sharply to $669,194, a gain of 56.2 per cent, largely due to the recovery of fire-fighting costs incurred during the record fire season. Weight-scaling costs recovery continued to increase, though the percentage of 11.2 was much less than that of previous years.

Financial tables covering operations on a fiscal year basis for 1969/70 can be found in the Appendix (Tables 143 to 145). Detailed expenditure information is published yearly by the Department of Finance in the Public Accounts.

ADMINISTRATION

Divisional administrative activity during 1970 was highlighted by the unsettled economic climate and the impact of the all-time record fire season.

The effects of the former, as noted above, caused greatly reduced revenues and brought inevitable collection problems. In most cases operators' accounts were maintained on a reasonably current basis, but the necessity for application of liens was more frequent than for some years. In some cases, co-operative payment arrangements were worked out with other creditors to enable operators to continue until their market and labour problems eased.

Accounting for fire-suppression expenditures gave added pressure to both district and headquarters offices and was not fully completed when the year closed.

The volume of normal accounting in all sections remained high, as expansion continued in various Forest Service programmes such as Reforestation, Inventory, etc.

Reduction of marine hazards by collection of drift logs continued, with 3,961,575 cubic feet marketed through Gulf Log Salvage Co-operative Association (licensee of the Log Receiving Station), essentially the same volume as 1969, though it includes approximately 583,666 cubic feet of low-floating logs previously marketed directly by permittees.

Low-floating logs and deadheads recovered and marketed direct by permittees and Harbour Commissions in the Fraser River totalled 974,000 cubic feet. Low-grade logs recovered was down at approximately 500,000 cubic feet.

Poor markets for salvage logs have tended to lower the total recovery of lost logs, while towing strikes and improved log security reduced somewhat the log losses.

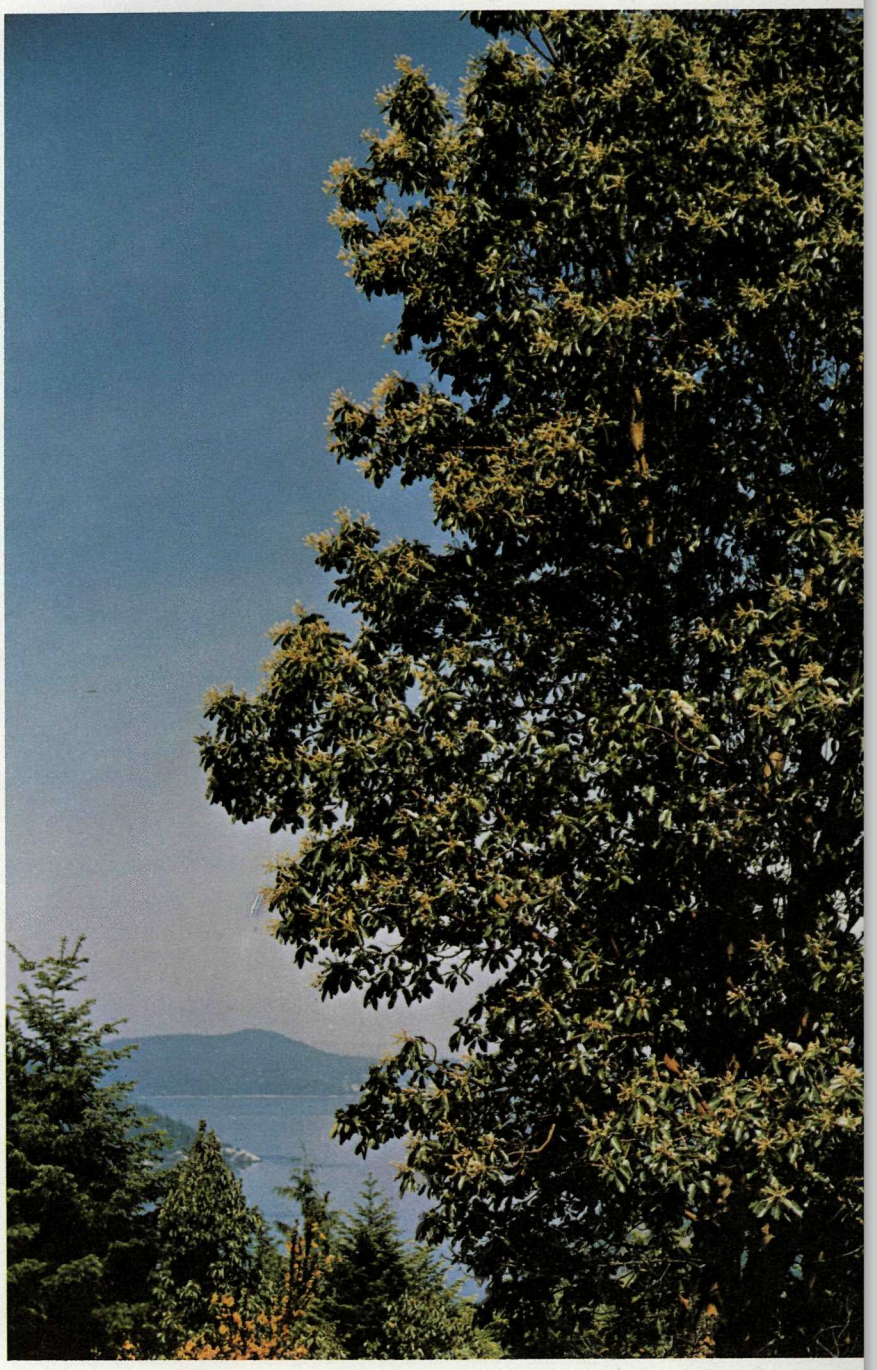
Log clearance from beaches increased approximately 300,000 cubic feet, with 332,000 cubic feet being removed from two licences on the Queen Charlotte Islands, 42,000 cubic feet from licences on two Interior lakes—Decker Lake and Burns Lake —, and 448,000 cubic feet from five licences on the west coast of Vancouver Island.

The Division continues in close co-operation with the forest industry's Log Security Committee in its studies of ways to prevent log losses.

The Division participated in a substantial study directed toward determining causes of log losses and sources of floating debris in the waters of Georgia Strait.

Export of logs controlled under Part X of the *Forest Act* continued at a fairly high level during the year, mainly due to large log stocks that accompanied the low log-market conditions.

personnel division



ARBUTUS

PERSONNEL DIVISION

There were no major organizational changes involving senior staff and no disruption in the administration of the Service. The Civil Service Commission commenced a general review of Clerks 7 and Junior Administrative Officers which had not been completed by the end of the year. An in-service organizational study was commenced, involving technical and professional staff and is still progressing.

Regarding employee relations, the Chief Forester and the Personnel Officer met with the Civil Service Commission and employee groups to discuss salaries, and this resulted in the above-noted organizational study.

COMMUNICATIONS AND TRAINING

The biannual meeting of District Foresters and Assistant District Foresters was held in Victoria in January to discuss common problems. Ranger meetings were held in Prince Rupert, Prince George, and Kamloops Forest Districts, with local or zone meetings held in the Vancouver and Nelson Districts. District Protection Officers met in Victoria to discuss problems met and lessons learned during our worst fire season. Engineering and Forest Inventory conducted their usual pre-field season orientation and safety training programme.

The Personnel Officer and Assistant Personnel Officer took part in vocation day-programmes at various secondary schools, as did other Forest Officers throughout the Province. A number of seminars and workshops were attended by various employee groups throughout the year. Two Foresters and two Technical Forest Officers were selected for Class XV of the Public Administration Course under the Executive Development Training Programme, and two Foresters and two Engineers graduated from Class XII of this programme, receiving diplomas in public administration from the University of Victoria.

Four employees graduated from the correspondence course in public administration and four employees were selected for Class VII of this course. Five Weighscalers were selected for the "supervision-staff management" section of this course. Informal training continued for junior Foresters and junior Engineers, as did the formal training programme for district field staff.

ESTABLISHMENT, RECRUITMENT, AND STAFF TURNOVER

The permanent establishment of the Forest Service remained at 906. During the year, 88 persons received Civil Service appointments and 115 left the Service. Ten Forest Service employees received certificates for 25 years' continuous service. There were 14 retirements and 37 transfers of permanent staff. Eleven graduate Foresters and five graduate Engineers left the Service, while 14 graduate Foresters and seven graduate Engineers were hired.

Turnover of Civil Service appointed staff, including full-time casual staff, was 9.2 per cent, a significant decrease from 12.3 per cent in 1969. Prince Rupert suffered the greatest disruption, but was only 16.2 per cent, compared to 24.1 per cent for 1969. Next in descending order were the Prince George District, Vancouver Scaling, and Vancouver District, with 13.8 per cent, 12.5 per cent, and 12 per cent respectively. Nelson and Kamloops Districts were 10.2 per cent and 7.9 per cent, while Victoria headquarters was lowest at 5.6 per cent.

Professional staff turnover decreased to 5.7 per cent from 6.6 per cent in 1969, and technical staff at 4.8 per cent was down from 7.7 per cent in 1969. The clerical

group had the highest turnover at 15.7 per cent, with figures ranging from 27.3 per cent in the Prince Rupert District to 7.7 per cent in Victoria headquarters.

In the matter of discipline, one temporary employee was dismissed and two annual increments were withheld from employees—both on temporary appointments. A total of 1,122 written applications for employment was received and processed by the Personnel Office in addition to those handled by the district and divisional staff.

The usual promotional examinations for Draughtsmen were held by the Civil Service Commission. Oral examinations were held at panel interviews to fill 28 positions. The Personnel Officer and Assistant Personnel Officer participated in filling 88 other positions, and 275 candidates wrote the Technical Forest Officer 1 examination for appointment to Assistant Ranger, in which 140 candidates qualified to fill 20 vacancies. Sixty-six employees wrote the Technical Forest Officer 1 examination for reclassification, of which 34 were successful. Technical Forest Officer 2 and 3 examinations were held at the same time, with 76 candidates for Technical Forest Officer 2, of which 47 qualified, and 18 candidates from services divisions successfully completed the Technical Forest Officer 3 examination. Twenty-four employees completed a basic-training course at the Forest Service Training School, and 24 others completed the first half of an advanced course at the same establishment.

CLASSIFICATIONS, SALARIES, AND WORKING CONDITIONS

Classification reviews were requested for 52 positions. By the end of the year, 37 had been approved, 5 rejected, and 10 were still under consideration. Nine employees were registered as Professional Foresters, and two graduate Engineers received professional registration.

Working conditions in general remained unchanged, but bimonthly meetings of departmental Personnel Officers with the Chairman and senior staff of the Civil Service Commission continue to investigate areas where improved working conditions can take place.

There were 499 accidental injuries suffered by employees, of which 223 were to temporary fire-fighters. Of the 276 for the regular and seasonal staff, 111 were time-loss over one day and 165 required medical aid only. Our time-loss frequency was 20.5 accidents per million man-hours worked, an increase over 16.8 for 1969. Time-loss accidents for regular staff were 40.2 per cent of the total accidents for this group, as compared to 32 per cent for 1969.

Twelve British Columbia Safety Council awards of merit were earned by various groups in the Service, which included one gold and five silver awards. Two of the silver awards were for a district and a division and qualified the Department for the Prime Minister's safety award. There was one fatal accident in the Forest Service during 1970.

PERSONNEL DIRECTORY, 1970

(As of December 31)

VICTORIA HEADQUARTERS

J. S. STOKES - - - - - - - - - - DEPUTY MINISTER OF FORESTS
L. F. SWANNELL - - - - - - - - - - - - CHIEF FORESTER
I. T. Cameron - - - - - - - - Assistant Chief Forester i/c Operations
N. A. McRae - - - - - - - - Assistant Chief Forester i/c Services

Staff Division Heads:

C. Cooper - - - - - - - - - - - - - Forest Counsel
W. V. Hicks - - - - - - - - - - - Departmental Comptroller

Operations Branch Division Heads:

W. C. Phillips - - - - - - - - Forester i/c Protection Division
W. G. Hughes - - - - - - - - Forester i/c Management Division
W. E. L. Young - - - - - - - - Forester i/c Inventory Division
W. C. Pendray - - - - - - - - - - Director, Grazing Division

Services Branch Division Heads:

E. W. Robinson - - - - - - - - Forester i/c Reforestation Division
R. H. Spilsbury - - - - - - - - Forester i/c Research Division
E. H. Lyons - - - - - - - - - Forester i/c Information Division
L. W. W. Lehrle - - - - - - Forester i/c Forest Service Training School
P. J. J. Hemphill - - - - - - - - Engineer i/c Engineering Division
A. E. McKeever - - - - - - - - - - - - Personnel Officer

FOREST DISTRICTS

VANCOUVER FOREST DISTRICT

H. B. FORSE - - - - - - - - - - - - - - DISTRICT FORESTER
J. A. K. Reid - - - - - - - - - - - Assistant District Forester

Forest Rangers:

W. G. Howard (Cultus Lake); E. J. McArthur (Hope); J. T. Schmidt (Harrison Lake); J. N. Nelson (Mission); M. H. Mudge (Port Moody); M. N. Neighbor (Squamish); R. S. Wilson (Sechelt); K. A. Northrup (Pender Harbour); S. B. Hollinshead (Powell River); V. J. Doerksen (Lund); G. Stefanac (Campbell River North); W. C. Archer (Sayward); R. A. Campbell (Port McNeill N.); R. D. Moss (Port McNeill); A. J. Teindl (Port Hardy); T. Brooks (Campbell River); H. Norbirg (Parksville); S. J. Sykes (Duncan); R. W. Thomas (Lake Cowichan); K. Haley (Port Alberni); G. F. Hawkey (Tofino); D. E. Gill (Pemberton); D. E. deHart (Gold River).

PRINCE GEORGE FOREST DISTRICT

W. YOUNG - - - - - - - - - - - - - - DISTRICT FORESTER
W. G. Bishop - - - - - - - - - - - Assistant District Forester

Forest Rangers:

G. W. Graham (McBride); J. H. Little (Valemount); M. A. McRae (Prince George E.); G. E. Meents (Prince George N.); L. G. Espenant (Fort St. James); G. M. York (Quesnel); H. T. Barbour (Dawson Creek); D. A. Amonson (Aleza Lake); H. Osborne (Vanderhoof); V. G. Bate (Fort St. John); P. F. Griffiths (Fort Fraser); T. R. Gibbs (Summit Lake); H. L. Miskovich (Fort Nelson); G. E. Magee (Prince George); D. F. Wallin (Hixon); E. W. Hewitt (Quesnel); K. Rohn (Quesnel); L. McQueen (Chetwynd); K. W. Magee (Mackenzie).

Nelson Forest District

J. R. Johnston - District Forester
M. G. Isenor - Assistant District Forester

Forest Rangers:

L. G. Taft (Invermere); J. L. Humphrey (Fernie); S. E. Anderson (Golden); J. B. Gierl (Cranbrook E.); A. I. Ross (Creston); G. B. Allin (Kaslo); G. L. Benwell (Lardeau); R. E. Robinson (Nelson); C. C. Jupp (New Denver); J. H. Raven (Nakusp); H. R. Wood (Castlegar); P. F. Russell (Grand Forks); W. R. Anderson (Kettle Valley); G. M. Cartwright (Canal Flats); W. G. Benwell (Mica Creek); R. G. Treneman (Fauquier); G. F. Dodd (Elko); G. R. Webster (Spillimacheen); L. O. Hamann (Cranbrook W.); H. B. Thompson (Beaverdell); C. N. Bellmond (Salmo); H. D. Hamilton (Revelstoke).

Kamloops Forest District

A. H. Dixon - District Forester
L. B. B. Boulton - Assistant District Forester

Forest Rangers:

H. V. Hopkins (Lumby); M. E. Monteith (Birch Island); D. J. Wittner (Barriere); J. P. Weinard (Kamloops); V. D. Craig (Chase); R. C. Jackson (Salmon Arm); G. G. Jones (Sicamous); J. Wanderer (Lillooet); A. G. Cameron (Vernon); R. W. McDaniel (Penticton); F. M. Baker (Princeton); A. P. Petty (Clinton); J. G. Ward (Williams Lake); E. A. Bouchard (Alexis Creek); F. Pearce (Kelowna); J. D. Noble (Ashcroft); R. K. Berard (Merritt); D. Reiter (Blue River); I. M. Loomer (Enderby); W. R. Perry (100 Mile North); T. A. Walker (Tatla Lake); J. F. Lynn (Horsefly); R. W. Donnelly (100 Mile South).

Prince Rupert Forest District

H. M. Pogue - District Forester
W. F. Tuttle - Assistant District Forester

Forest Rangers:

F. L. Roe (Queen Charlotte City); O. D. Parsey (Prince Rupert); T. Harvie (Terrace); N. P. Gilgan (Kitwanga); H. W. Quast (Hazelton); A. R. Pement (Smithers); R. H. Weinard (Houston); D. B. Doerksen (Burns Lake); E. Hardwick (Bella Coola); W. H. Jones (Southbank); D. J. Neal (Lower Post); W. C. Waldron (Kitimat); M. F. Wilkinson (Stewart).

APPENDIX

TABULATED DETAILED STATEMENTS TO SUPPLEMENT THE REPORT OF THE FOREST SERVICE, 1970

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Active at beginning of year	103
Terminated	12
New projects	5
Active at end of year	96

RESEARCH PROJECTS BY DISTRICTS

Subject	Vancouver	Prince Rupert	Prince George	Kamloops	Nelson
Land classification	1	1	----	1	----
Tree-breeding	4	----	1	----	----
Plant ecology	2	----	2	----	1
Silvicultural systems	----	----	----	----	1
Natural regeneration	----	1	1	----	1
Choice and trial of species	5	2	2	1	1
Nursery practice	15	----	1	----	----
Direct seeding	1	2	1	4	----
Planting	3	4	2	1	3
Spacing	3	4	2	3	1
Forest fertilization	1	----	----	----	----
Tending of stands	9	1	----	2	2
Statistics	2	----	----	----	----
Management: Economics	----	----	----	----	1
Totals	46	15	12	12	11

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(22) SUMMARY OF PLANTINGS, 1961–70

Year	Forest Service on Crown Land		Forest Service on Crown-granted Land (Forest Act, Sec. 152)		Companies on Tree-farm Licences		Companies on Timber Sale Harvesting Licences		Other Private		Totals	
	Trees in Thousands	Acres	Trees in Thousands	Acres	Trees in Thousands	Acres	Trees in Thousands	Acres	Trees in Thousands	Acres	Trees in Thousands	Acres
Coast												
1970[1]	7,202.0	17,448	118.0	270	10,616.5	30,512	.....	.....	7,914.6	20,065	25,851.1	68,295
1969	4,579.0	11,021	107.0	201	9,981.6	28,666	.....	.....	5,673.6	14,885	20,341.2	54,773
1968	3,731.9	8,541	82.0	211	8,797.3	25,139	.....	.....	5,470.1	16,688	18,081.3	50,579
1967	4,052.1	9,237	.....	.....	7,036.6	21,784	.....	.....	3,860.6	11,710	14,949.3	42,731
1966	3,856.0	9,241	19.0	55	8,431.9	24,762	.....	.....	3,828.8	11,352	16,135.7	45,410
1965	3,221.7	9,398	628.0	1,453	7,038.5	20,742	.....	.....	4,432.5	13,023	15,320.7	44,616
1964	1,172.4	3,267	1,165.3	3,247	6,917.4	20,395	.....	.....	3,720.6	10,886	12,975.7	37,795
1963	2,080.0	5,413	1,592.2	3,538	6,487.3	18,463	.....	.....	3,130.6	9,226	13,290.1	36,640
1962	1,202.8	2,703	1,758.2	4,240	4,903.1	14,536	.....	.....	1,792.3	5,015	9,656.4	26,494
1961	330.0	770	563.3	1,508	4,549.6	14,399	.....	.....	1,120.4	3,145	6,563.3	19,822
Previously planted	89,444.0	107,399	9,380.9	12,964	35,404.7	74,250	.....	.....	2,850.5	4,188	137,080.1	198,801
Totals to date	120,871.9	184,438	15,413.9	27,687	110,164.5	293,648	.....	.....	43,794.6	120,183	290,244.9	625,956
Interior												
1970[1]	7,201.0	14,672	.....	.....	673.0	1,934	40.0	66	166.0	369	8,080.0	17,041
1969	5,019.9	11,167	.....	.....	301.7	911	.....	.....	70.7	127	5,392.3	12,205
1968	2,512.3	5,854	.....	.....	360.0	921	.....	.....	129.3	222	3,001.6	6,997
1967	1,785.3	3,747	.....	.....	635.5	1,557	.....	.....	95.5	207	2,516.3	5,511
1966	2,292.6	4,835	.....	.....	579.7	1,957	.....	.....	120.7	304	2,993.0	7,096
1965	1,755.9	5,442	.....	.....	614.9	2,669	.....	.....	130.4	382	2,501.2	8,493
1964	1,102.2	2,999	.....	.....	207.3	980	.....	.....	45.2	128	1,354.7	4,107
1963	595.4	1,304	.....	.....	329.7	928	.....	.....	5.9	11	931.0	2,243
1962	553.1	1,146	.....	.....	346.8	1,011	.....	.....	10.0	25	909.9	2,182
1961	408.3	1,008	.....	.....	259.1	675	.....	.....	1.8	3	669.2	1,686
Previously planted	3,179.7	4,854	.....	.....	706.6	1,264	.....	.....	232.3	312	4,118.6	6,430
Totals to date	26,405.7	57,028	.....	.....	5,014.3	14,807	40.0	66	1,007.8	2,090	32,467.8	73,991
All planted to date	147,277.6	241,466	15,413.9	27,687	115,178.8	308,455	40.0	66	44,802.4	122,273	322,712.7	699.947
All planted this year	14,403.0	32,120	118.0	270	11,289.5	32,446	40.0	66	8,080.6	20,434	33,931.1	85,336

[1] Subject to corrections due to late returns.

(47) SUMMARY OF BASIC DATA FOR TREE-FARM LICENCES (PRIVATE SUSTAINED-YIELD UNITS)

Forest District	Number of Tree-farm Licences	Productive Area (Acres)			Total Area (Acres)	Allowable Cut (Cunits)
		Schedule B[1]	Schedule A[2]	Total		
Vancouver	17[3]	2,703,553	1,285,480	3,989,033	6,893,670	3,628,300
Prince Rupert	5[3]	3,513,571	168,091	3,681,662	10,982,769	1,398,000
Prince George	2	471,576	2,404	473,980	562,992	184,000
Kamloops	7	726,253	1,841	728,094	776,982	181,960
Nelson	5	1,293,553	47,833	1,341,386	3,348,458	424,050
Totals	34	8,708,506	1,505,649	10,214,155	22,564,871	5,816,310

[1] Schedule B is vacant Crown land.

[2] Schedule A is land for which the tree-farm licence-holder has cutting rights other than those conveyed by the tree-farm licence agreement. This may include lands held in fee-simple or temporary tenures, e.g., timber leases, licences, and berths. Following removal of the mature timber, lands held under temporary tenure are transferred to Schedule B.

[3] Two tree-farm licences located in both districts.

(48) SUMMARY OF BASIC DATA FOR CERTIFIED TREE-FARMS (PRIVATE SUSTAINED-YIELD UNITS OVER CROWN-GRANTED LANDS)

Within Tree-farm Licences

Forest District	Number of Tree-farms	Productive Area (Acres)				Total Area (Acres)	Estimated Productive Capacity (Cunits)
		Mature	Immature	N.S.R. and N.C.C.	Total		
Vancouver	12	74,201	215,140	33,999	323,340	362,270	328,352
Prince George	1	188	1,002	31	1,221	1,280	458
Nelson	2	1,669	4,719	3,219	9,607	10,158	4,212
Totals	15	76,058	220,861	37,249	334,168	373,708	333,022

Not Included Within Tree-farm Licences

Vancouver	21	110,625	290,660	40,960	442,245	470,489	354,817
Nelson	11	101,373	220,631	103,070	425,074	525,599	93,846 (346,096)
Totals	32	211,998	511,291	144,030	867,319	996,088	448,663 (346,096)
Grand totals	47	288,056	732,152	181,279	1,201,487	1,369,796	781,685 (346,096)

Figures in parentheses are Christmas trees

(49) SUMMARY OF BASIC DATA FOR FARM WOOD-LOT LICENCES (PRIVATE SUSTAINED-YIELD UNITS)

Forest District	Number of Farm Wood-lot Licences	Productive Area (Acres)			Total Area (Acres)	Allowable Annual Cut (Cunits)
		Crown	Private	Total		
Vancouver	13	1,961	258	2,219	3,086	796
Prince Rupert	5	1,570	235	1,805	3,261	332
Prince George	14	3,203	165	3,368	3,589	1,028
Kamloops	4	1,115	146	1,261	1,420	260
Nelson	4	1,359	617	1,976	2,071	251
Totals	40	9,208	1,421	10,629	13,427	2,667

(50) SUMMARY OF BASIC DATA FOR PUBLIC SUSTAINED-YIELD UNITS

Forest District	Number of Units	Productive Area (Acres)			Total Area (Including Nonforest) (Acres)	Close Utilization Allowable Annual Cut (Cunits)
		Mature	Immature	Total Productive (Includes N.S.R. and N.C.C.)		
Vancouver	6	3,261,291	1,483,590	5,226,105	10,370,425	2,837,000[1]
Prince Rupert (Coast)	4	4,327,545	324,254	4,720,399	11,616,283	2,540,610[1]
Prince Rupert (Interior)	7	5,750,543	3,154,641	9,297,931	14,272,760	2,544,500[2]
Prince George	23	14,740,900[3]	13,971,819[3]	30,614,598[3]	43,278,335[3]	6,575,980[2]
Kamloops	24	9,368,082[4]	10,878,306[4]	21,354,966[4]	28,163,359[4]	4,074,850[2]
Nelson	14	2,779,447	4,972,013	8,577,603	14,287,482	2,176,800[2]
Totals	78	40,227,808	34,784,623	79,791,602	121,988,644	20,749,740

[1] Close Utilization Allowable Annual Cut (Cunits) 9.1"+d.b.h.
[2] Close Utilization Allowable Annual Cut (Cunits) 7.1"+d.b.h.
[3] Area of 23 units, plus Prince George part of Chilko PSYU.
[4] Area of 24 units, including Kamloops part of Chilko PSYU.

(51) TOTAL AMOUNT OF TIMBER SCALE BILLED IN BRITISH COLUMBIA DURING THE YEARS 1969 AND 1970 IN CUBIC FEET

Forest District	10-year Average, 1961–70	1969	1970	Increase	Decrease	Net Increase
Vancouver	754,524,462	845,336,234	841,763,523	.....	3,572,711	.....
Prince Rupert (C.)	120,604,926	149,076,083	176,445,647	27,369,564	.....	.....
Totals, Coast	875,129,388	994,412,317	1,018,209,170	27,369,564	3,572,711	23,796,853
Prince Rupert (I.)	80,135,820	117,515,468	102,832,928	.....	14,682,540	.....
Prince George	235,068,087	333,228,284	375,152,916	41,924,632	.....	.....
Kamloops	235,968,002	262,700,510	262,744,626	44,116	.....	.....
Nelson	146,887,519	182,195,653	173,688,797	.....	8,506,856	.....
Totals, Interior	698,059,428	895,639,915	914,419,267	41,968,748	23,189,396	18,779,352
Grand totals	1,573,188,816	1,890,052,232	1,932,628,437	69,338,312	26,762,107	42,576,205

(52) SPECIES CUT, ALL PRODUCTS, 1970, IN CUBIC FEET

Forest District	Fir	Cedar	Spruce	Lodgepole Pine	Hemlock	Balsam	White Pine
Vancouver	181,434,231	178,955,967	12,663,824	72,479	301,198,220	141,189,267	4,681,786
Prince Rupert (C.)	5,602,531	24,808,188	31,278,823	272,886	79,598,341	30,836,665	5,501
Totals, Coast	187,036,762	203,764,155	43,942,647	345,365	380,796,561	172,025,932	4,687,287
Prince Rupert (I.)	292	5,999,090	28,082,643	28,566,070	22,592,933	15,595,810	.....
Prince George	31,096,978	1,074,628	206,696,647	112,746,110	416,229	21,096,254	59,995
Kamloops	109,808,108	13,008,888	72,861,811	32,179,029	8,319,661	17,187,921	1,788,708
Nelson	19,954,219	29,682,384	62,924,583	12,477,708	17,510,680	17,603,769	3,313,675
Totals, Interior	160,859,597	49,764,990	370,565,684	185,968,917	48,839,503	71,483,754	5,160,378
Grand totals	347,896,359	253,529,145	414,508,331	186,314,282	429,636,064	243,509,686	9,847,665

Forest District	Yellow Pine	Cypress	Larch	Hardwood	Cotton-wood	Unspecified	Total
Vancouver	919	16,481,316	55	662,837	2,801,697	1,620,925	841,763,523
Prince Rupert (C.)	194	475,902	.....	24,731	3,507,517	34,368	176,445,647
Totals, Coast	1,113	16,957,218	55	687,568	6,309,214	1,655,293	1,018,209,170
Prince Rupert (I.)	.....	.....	.....	46,274	1,949,816	.....	102,832,928
Prince George	.....	.....	.....	292,467	1,675,608	.....	375,152,916
Kamloops	4,721,633	.....	2,511,967	321,352	35,548	.....	262,744,626
Nelson	545,529	.....	9,457,709	10,055	208,486	.....	173,688,797
Totals, Interior	5,267,162	.....	11,969,676	670,148	3,869,458	.....	914,419,267
Grand totals	5,268,275	16,957,218	11,969,731	1,357,716	10,178,672	1,655,293	1,932,628,437

(53) TOTAL SCALE OF ALL PRODUCTS BILLED IN 1970 IN CUBIC FEET (SEGREGATED BY LAND STATUS AND FOREST DISTRICTS)

Land Status	Vancouver	Prince Rupert (Coast)	Prince Rupert (Interior)	Prince George	Kamloops	Nelson	Total
Timber licences	139,693,135	54,240,962	.....	1,474,165	3,935,751	3,967,097	203,311,110
Timber berths	11,644,964	.....	.....	.....	9,081,811	1,572,687	22,299,462
Timber leases	38,149,626	.....	.....	.....	.....	.....	38,149,626
Pulp leases	37,206,917	8,360,026	.....	.....	.....	.....	45,566,943
Pulp licences	6,823,068	6,363,453	.....	.....	.....	.....	13,186,521
Farm wood-lots	55,437	.....	1,584	52,693	16,900	21,451	148,065
Timber sales	187,057,189	50,165,195	60,908,977	312,743,141	189,524,268	104,427,114	904,825,884
Tree-farm licences	143,306,165	41,183,382	28,694,000	16,641,184	20,308,287	41,744,750	291,877,768
Beachcomb, trespass	8,458,586	1,451,894	439,328	.....	.....	.....	10,349,808
No mark visible	49,589,800	3,200	.....	.....	.....	.....	49,593,000
Miscellaneous	1,048,955	1,310,955	1,474,281	29,730,545	10,743,154	3,512,427	47,820,317
Subtotals, Crown lands	623,033,842	163,079,067	91,518,170	360,641,728	233,610,171	155,245,526	1,627,128,504
Federal lands	5,236,687	3,920,104	1,686,821	329,179	2,719,866	57,694	13,950,351
Crown grants—							
To 1887	179,269,031	22,558	.....	15,919	6,265,865	3,884,760	189,458,133
1887–1906	7,584,514	2,920,670	287,660	66,294	2,084,523	6,894,765	19,838,426
1906–14	4,804,615	591,585	1,428,685	2,054,564	4,692,334	1,360,419	14,932,202
1914 to date	21,834,834	5,911,663	7,911,592	12,045,232	13,371,867	6,245,633	67,320,821
Totals	841,763,523	176,445,647	102,832,928	375,152,916	262,744,626	173,688,797	1,932,628,437

(54) TIMBER SCALE BILLED IN BRITISH COLUMBIA DURING 1970 (BY MONTHS AND FOREST DISTRICTS)

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Vancouver—													
F.b.m	101,727,863	74,297,643	85,818,547	99,019,335	72,278,814	57,124,196	55,377,650	54,430,832	65,219,001	80,480,009	78,519,538	47,269,965	871,563,393
Cubic feet	46,764,685	69,895,396	53,573,018	68,629,327	61,376,276	31,283,826	59,020,442	49,025,548	67,377,962	63,314,758	71,053,689	49,863,460	691,178,387
Lineal feet	380,232	167,810	233,985	350,202	251,645	394,232	499,833	354,011	429,302	270,450	155,235	189,995	3,676,932
Cords	802	2,426	2,591	2,223	2,489	3,057	3,091	2,592	2,998	1,714	2,282	2,511	28,776
All products, cu. ft.	63,992,957	82,586,959	68,274,871	85,585,870	73,827,729	41,397,382	68,924,861	58,609,866	78,860,351	77,097,968	84,478,009	58,126,700	841,763,523
Prince Rupert (C.)—													
F.b.m	15,306,018	2,684,025	1,837,689	5,953,260	2,910,607	1,130,375	4,273,741	6,210,363	6,914,990	11,046,829	4,371,992	4,091,561	66,731,450
Cubic feet	11,491,770	13,515,539	12,915,586	13,980,697	17,569,005	11,402,664	5,868,925	12,743,388	13,754,112	19,401,713	12,802,062	19,779,671	165,225,132
Lineal feet	22,484	.....	3,705	49,665	37,050	435	.....	.....	.....	1,590	22,505	21,495	158,929
Cords	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
All products, cu. ft.	14,049,049	13,962,876	13,224,646	15,000,156	18,081,894	11,591,385	6,581,215	13,778,448	14,906,610	21,244,044	13,547,606	20,477,718	176,445,647
Prince Rupert (I.)—													
F.b.m	824,189	1,322,084	1,958,145	1,277,728	516,179	476,388	314,318	532,112	511,830	1,129,044	297,262	504,008	9,663,287
Cubic feet	7,639,925	9,614,029	19,111,419	10,213,902	4,812,931	3,520,000	4,046,686	6,965,902	5,591,729	14,242,817	7,600,078	7,489,204	100,848,622
Lineal feet	28,592	12,325	12,560	16,100	591,360	.....	5,980	2,580	374,190	228,270	5,425	19,220	1,296,602
Cords	100	2	.....	4	.....	13	.....	.....	13	.....	14	10	156
All products, cu. ft.	7,802,662	9,853,368	19,461,385	10,448,510	5,010,221	3,604,150	4,105,835	7,060,378	5,752,697	14,484,375	7,657,275	7,592,072	102,832,928
Prince George—													
F.b.m	2,232,043	2,985,806	1,368,845	2,015,450	4,305,175	1,228,057	3,142,277	2,980,778	4,028,024	847,392	6,754,736	1,807,235	33,695,818
Cubic feet	21,703,657	24,219,826	55,858,858	29,884,701	55,933,023	27,294,611	13,474,293	30,124,733	16,678,028	33,117,755	35,883,647	24,860,571	369,033,703
Lineal feet	.....	.....	.....	2,435	7,470	16,975	2,100	2,042	4,450	.....	1,550	1,400	38,422
Cords	45	29	138	.....	500	315	215	101	389	63	324	200	2,319
All products, cu. ft.	22,096,328	24,742,047	56,110,666	30,237,040	56,737,120	27,552,423	14,043,942	30,654,179	17,419,997	33,271,417	37,091,779	25,195,978	375,152,916
Kamloops—													
F.b.m	3,173,440	3,308,928	3,868,632	3,819,216	3,717,230	5,789,292	4,470,694	3,185,826	3,409,127	3,644,235	2,842,106	3,677,209	44,905,935
Cubic feet	17,719,034	31,053,443	28,274,729	18,585,796	7,127,179	12,085,362	21,932,446	19,077,565	20,190,691	22,032,765	25,375,567	30,277,382	253,731,959
Lineal feet	59,030	9,300	104,615	81,428	24,890	175,481	159,056	139,620	128,785	144,260	100,275	163,741	1,290,481
Cords	289	54	65	86	129	87	214	54	1,436	[1]912	508	592	2,602
All products, cu. ft.	18,336,367	31,640,403	29,000,295	19,325,932	7,803,393	13,232,226	22,856,751	19,747,808	21,025,072	22,683,722	25,993,923	31,098,734	262,744,626
Nelson—													
F.b.m	1,861,792	3,071,797	3,337,535	4,435,943	2,234,205	2,525,871	2.883,328	3,277,054	4,553,653	3,585,463	1,856,637	6,888,050	40,511,328
Cubic feet	7,577,974	13,154,790	21,207,925	14,485,007	12,517,002	4,833,720	9,766,334	15,597,714	12,778,531	14,272,872	13,053,527	24,880,858	164,126,254
Lineal feet	175,487	173,594	71,790	178,478	44,457	323,340	187,622	257,109	292,021	263,852	337,623	271,736	2,577,109
Cords	1,592	1,444	476	386	700	1,203	532	438	902	1,609	580	848	10,710
All products, cu. ft.	8,130,626	13,938,830	21,874,756	15,376,521	12,999,791	5,559,707	10,413,778	16,371,923	13,879,489	15,197,250	13,608,538	26,337,588	173,688,797
Totals—													
F.b.m	125,125,345	87,670,283	98,189,393	116,520,932	85,962,210	68,274,179	70,462,008	70,616,965	84,636,625	100,732,972	94,642,271	64,238,028	1,067,071,211
Cubic feet	112,897.045	161,453,023	190,941,535	155,779,430	159,335,416	90,420,183	114,109,126	133,534,850	136,371,053	166,382,680	165,768,570	157,151.146	1,744,144,057
Lineal feet	665,825	363,029	426,655	678,308	956,872	910,463	854,591	755,362	1,228,748	908,422	622,613	667,587	9,038,475
Cords	2,828	3,955	3,270	2,699	3,818	4,675	4,052	3,185	5,738	2,474	3,708	4,161	44,563
All products, cu. ft.	134,407,989	176,724,483	207,946,619	175,974,029	174,460,148	102,937,273	126,926,382	146,222,602	151,844,216	183,978,776	182,377,130	168,828,790	1,932,628,437

[1] Debit.

(55) NUMBER OF ACRES OPERATING UNDER APPROVED ANNUAL ALLOWABLE CUTS, 1961–70

Year	Tree-farm Licences		Tree-farms[1]		Christmas-tree Permits		Farm Wood-lots		Public Sustained-yield Units		Total Acres
	Number	Productive Acres	Number	Productive Acres	Number	Productive Acres[2]	Number	Productive Acres	Number	Productive Acres	
1961	39	7,017,594	22	545,164	282	96,478	50	11,993	78	46,203,742	53,778,493
1962	39	7,054,191	22	665,666	306	106,966	57	14,940	80	48,940,122	56,674,919
1963	39	7,070,774	25	672,712	346	123,538	53	14,124	82	52,530,686	60,288,296
1964	39	7,146,685	28	682,553	348	119,911	55	14,950	83	60,960,307	68,804,495
1965	40	8,796,577	31	709,452	352	120,065	51	13,978	75	69,781,944	79,301,951
1966	38	9,633,579	32	712,152	347	115,175	47	12,632	76	75,536,237	85,894,600
1967	36	9,687,984	31	714,901	351	119,421	46	12,522	76	75,727,896	86,143,303
1968	36	9,770,637	31	806,123	350	116,594	43	11,165	77	78,545,907	89,133,832
1969	35	9,806,590	30	809,207	344	116,498	43	11,155	77	79,158,869	89,902,319
1970	34	10,214,155	32	867,319	331	110,543	42	11,378	78	79,791,602	90,994,997

[1] Exclusive of tree-farms incorporated into tree-farm licences.
[2] Also included in productive acres under public sustained-yield units.

(56)

TOTAL SCALE OF ALL PRODUCTS FROM AREAS OPERATED UNDER APPROVED ANNUAL ALLOWABLE CUTS, 1961–70

Year	Tree-farm Licences		Tree-farms[1]		Christmas Trees			Farm Wood-lots		Public Sustained-yield Units		Total[3] (Cubic Feet)
					Permits		Other Sources[2] (Number of Trees)					
	Number	Cubic Feet	Number	Cubic Feet	Number	Number of Trees		Number	Cubic Feet	Number	Cubic Feet	
1961	39	279,917,294	22	27,842,000	282	434,796	323,254	50	244,577	78	454,029,600	762,033,471
1962	39	337,057,599	22	35,678,000	306	552,512	153,618	57	277,701	80	527,054,000	900,067,300
1963	39	365,631,639	25	33,305,000	346	617,753	220,393	53	263,678	82	633,193,000	1,032,393,317
1964	39	350,806,403	28	34,543,000	348	511,726	395,168	55	253,552	83	607,641,611	993,244,566
1965	40	374,062,274	31	39,587,737	352	509,876	207,643	51	216,486	75	687,492,876	1,101,359,373
1966	38	405,623,421	32	45,058,717	347	494,798	239,378	47	166,963	76	640,946,702	1,091,795,803
1967	36	449,386,772	31	43,308,260	351	541,930	454,031	46	378,346	76	639,542,228	1,132,615,606
1968	36	515,466,148	31	65,574,000	350	499,373	413,398	43	289,177	77	700,560,822	1,281,890,147
1969	35	499,093,539	30	57,646,500	344	470,044	317,801	43	240,703	77	728,844,554	1,285,825,296
1970	34	494,232,431	32	38,349,000	333	381,050	344,466	42	133,261	78	842,894,259	1,375,608,951
Ten-year average, 1961–70	37	407,127,752	28	42,089,221	336	501,386	306,915	49	246,444	78	646,219,965	1,095,683,383

[1] Exclusive of tree-farms incorporated into tree-farm licences.
[2] Includes Christmas trees cut from tree-farm licences, tree-farms, and farm wood-lots.
[3] Total Christmas-tree cut is not shown.

(57)

LOGGING INSPECTIONS, 1970

Forest District	Type of Tenure Operated				Number of Inspections Made		
	Timber Sale Licences	Cutting Permits (Tree-farm Licences, Farm Wood-lot Licences, and Timber Sale Harvesting Licences)	Leases, Licences, Crown Grants, and Other Tenures	Total	Timber Sale Licences and Cutting Permits	Other Tenures	Total
Vancouver	912	286	1,608	2,806	3,008	2,948	5,956
Prince Rupert	225	205	552	982	2,351	1,489	3,840
Prince George	1,024	285	2,027	3,336	6,220	1,647	7,867
Kamloops	438	327	1,000	1,765	2,682	2,781	5,463
Nelson	282	169	1,043	1,494	1,819	1,247	3,066
Totals, 1970	2,881	1,272	6,230	10,383	16,080	10,112	26,192
Totals, 1969	3,511	876	7,358	11,745	17,518	8,682	26,200
Totals, 1968	4,719	(1)	7,758	12,477	17,480	10,092	27,572
Totals, 1967	5,118	(1)	7,431	12,549	17,663	9,488	27,151
Totals, 1966	5,566	(1)	6,174	11,740	18,593	9,576	28,169
Totals, 1965	6,231	(1)	6,514	12,745	17,869	6,365	24,234
Totals, 1964	6,557	(1)	6,560	13,117	17,789	13,311	31,100
Totals, 1963	6,926	(1)	7,168	14,094	18,021	7,189	25,210
Totals, 1962	7,079	(1)	6,645	13,724	18,602	6,353	24,955
Totals, 1961	7,088	(1)	6,463	13,551	18,330	6,242	24,572
Ten-year average, 1961–70	.....	.....	6,830	12,613	17,795	8,741	26,536

1 Figures not available prior to 1969.

(58) TRESPASSES, 1970

Forest District	Number of Cases	Area Cut Over (Acres)	Quantities Cut								Number of Resulting Seizures	Assessment in Dollars
			Cubic Feet	Lineal Feet	Cords	Ties	Christmas Trees	Cedar Shakes	Posts, Car Stakes	Reserved Trees		
Vancouver	86	276	1,082,531	.....	30	.....	109	22,700	.....	.....	3	$57,369.27
Prince Rupert	63	521	659,366	12,700	12	.....	.....	.....	.....	.....	....	39,905.70
Prince George	93	748	2,019,811	.....	.....	.....	.....	.....	.....	4	....	79,430.50
Kamloops	87	906	1,188,798	2,725	24	.....	406	.....	.....	.....	4	59,314.90
Nelson	51	1,094	1,145,320	7,668	4	.....	2,285	12,059	.....	.....	1	12,448.03
Totals, 1970	380	3,545	6,095,826	23,093	70	.....	2,800	34,759	.....	4	8	$248,468.40
Totals, 1969	399	2,595	4,723,128	6,220	56	.....	22,526	124,464	2,373	4	17	$371,964.95
Totals, 1968	378	2,229	3,067,915	34,013	778	.....	4,127	13,234	29,976	141	6	$260,438.20
Totals, 1967	319	1,724	2,785,911	9,365	2,910	.....	3,934	49,635	176	6	1	$184,724.80
Totals, 1966	435	2,921	4,184,997	64,535	37	.....	11,001	121,604	1,990	405	5	$272,439.56
Totals, 1965	436	4,517	4,093,758	93,546	118	.....	13,204	25,290	75	580	5	$239,156.97
Totals, 1964	464	2,488	3,023,375	56,250	305	.....	6,724	453,238	900	2,988	11	$284,797.47
Totals, 1963	546	3,761	4,085,328	36,401	3,494	.....	10,995	17,938	2,233	2,145	13	$257,136.75
Totals, 1962	524	4,210	4,174,109	78,879	790	2,125	8,141	57,600	3,412	1,048	7	$217,146.45
Totals, 1961	517	4,953	3,531,505	141,904	2,319	.....	9,239	164,415	179	1,038	10	$190,547.22
Ten-year average, 1961–70	440	3,294	3,976,785	54,421	1,088	212	9,269	106,218	4,131	836	8	$252,682.07

(59) AREAS CRUISED FOR TIMBER SALES, 1970

Forest District	Number Cruised	Acreage	Saw-timber (Cunits)	Pit-props, Poles, and Piles (Lin. Ft.)	Shingle-bolts and Cordwood (Cords)	Car Stakes, Posts, Shakes, Etc. (No.)
Vancouver	264	30,271	674,530	9,000	3,677	125,250
Prince Rupert	42	17,083	627,850	.....	150	.....
Prince George	143	76,078	2,456,970	.....	500	.....
Kamloops	48	39,931	355,210	.....	884	46,600
Nelson	75	30,374	573,060	52,400	66	54,000
Totals, 1970	622	193,737	4,687,620	61,400	5,277	225,850
Totals, 1969	732	233,491	4,451,260	15,300	13,392	2,910,012
Totals, 1968	890	314,595	6,738,850	3,269,400	6,769	704,950
Totals, 1967	848	310,325	5,498,070	6,014,850	12,352	319,450
Totals, 1966	998	361,021	6,794,860	3,674,100	25,675	837,244
Totals, 1965	1,357	496,254	9,519,950	2,650,400	7,616	987,100
Totals, 1964	1,709	661,821	11,074,280	2,944,004	25,154	478,520
Totals, 1963	1,862	716,699	11,659,760	3,887,525	32,519	656,680
Totals, 1962	1,871	615,500	9,217,100	18,508,084	19,340	564,865
Totals, 1961	1,892	720,144	10,272,430	7,687,920	14,798	1,419,285
Ten-year average, 1961–70	1,278	462,359	7,991,418	4,871,298	16,289	910,396

(60) TIMBER-SALE LICENCE RECORD, 1970

Forest District	Sales Made	Sales Closed	Total Sales Existing	Total Area (Acres)	Area Paying Forest Protection Tax (Acres)
Vancouver	285	320	965	335,268	308,017
Prince Rupert	34	154	223	95,456	79,422
Prince George	120	376	569	295,376	230,054
Kamloops	85	376	706	419,424	384,381
Nelson	42	137	301	318,943	298,908
Totals	566	1,363	2,764	1,464,467	1,300,782
Cash sales	633	.....	.....	.....	.....
Total sales	1,199	.....	.....	.....	.....

(61)

COMPETITION FOR TIMBER SALES AWARDED, 1970

Forest District	By Number of Sales									By Volume, Sawlogs Only (Cunits)						Total Volume
	Bid at Upset Stumpage		Bid Less Than Two Times the Upset Price		Bid More Than Two Times the Upset Price		Total Number (Cash Sales Excluded)	Cash Sales	District Totals (Cash Sales Included)	Bid at Upset Stumpage		Bid Less Than Two Times the Upset Stumpage		Bid More Than Two Times the Upset Stumpage		
	Number	Per Cent	Number	Per Cent	Number	Per Cent				Volume	Per Cent	Volume	Per Cent	Volume	Per Cent	
Vancouver	273	95.8	9	3.2	3	1.0	285	94	379	367,620	96.4	9,060	2.4	4,530	1.2	381,210
Prince Rupert	32	94.1	.....	.....	2	5.9	34	15	49	296,450	79.9	.....	.....	74,780	20.1	371,230
Prince George	117	97.5	3	2.5	.....	.....	120	103	223	917,020	99.6	3,910	0.4	.....	.....	920,930
Kamloops	70	82.3	5	5.9	10	11.8	85	278	363	293,880	84.1	19,160	5.5	36,310	10.4	349,350
Nelson	36	85.7	1	2.4	5	11.9	42	143	185	241,270	70.1	19,440	5.7	83,340	24.2	344,050
Totals, 1970	528	93.3	18	3.2	20	3.5	566	633	1,199	2,116,240	89.4	51,570	2.2	198,960	8.4	2,366,770
Totals, 1969	685	92.7	34	4.6	20	2.7	739	454	1,193	3,182,180	93.0	107,590	3.2	131,340	3.8	3,421,110
Totals, 1968	753	95.1	33	4.2	7	0.7	793	448	1,241	3,732,310	96.5	106,520	2.8	28,740	0.7	3,867,570
Totals, 1967	745	96.0	24	3.1	7	0.9	776	373	1,149	4,120,700	97.4	91,010	2.1	20,210	0.5	4,231,920
Totals, 1966	796	96.4	24	2.9	6	0.7	826	300	1,126	3,199,840	97.5	48,280	1.5	33,610	1.0	3,281,730
Totals, 1965	1,194	95.1	38	3.0	24	1.9	1,256	358	1,614	5,422,700	96.9	103,860	1.8	68,030	1.3	5,594,590
Totals, 1964	1,723	90.9	142	7.5	31	1.6	1,896	385	2,281	7,981,050	88.9	691,360	7.7	306,850	3.4	8,979,260
Totals, 1963	1,518	88.7	156	9.1	38	2.2	1,712	471	2,183	6,693,820	87.1	517,810	6.7	476,150	6.2	7,687,780
Totals, 1962	1,523	90.7	118	7.0	38	2.3	1,679	312	1,991	5,448,930	88.3	568,630	9.2	152,000	2.5	6,169,560
Totals, 1961	1,715	92.3	85	4.6	57	3.1	1,857	282	2,139	7,958,530	91.1	395,780	4.5	381,020	4.4	8,735,330
Ten-year average, 1961–70	1,118	92.4	67	5.5	25	2.1	1,210	402	1,612	4,985,637	91.8	268,241	4.9	179,691	3.3	5,433,562

(62)

TIMBER SALES AWARDED BY FOREST DISTRICTS, 1970

Forest District	No. of Sales	Acreage	Saw-timber (Cunits)	Poles and Piling (Lin. Ft.)	No. of Posts	No. of Cords	No. of Christmas Trees	No. of Car Stakes	No. of Cedar Shakes	No. of Fence Rails and Palings	Estimated Revenue
Vancouver	379	29,390	381,202	8,226	.....	5,583	.....	.....	.....	.....	$3,232,275.17
Prince Rupert	49	10,162	371,230	2,600	.....	389	.....	1,900	30,000	.....	1,790,096.40
Prince George	223	40,775	920,931	66,287	41,780	219	.....	.....	252,100	1,125	2,773,198.02
Kamloops	363	37,306	349,352	51,515	102,875	2,552	500	.....	.....	2,550	1,127,423.26
Nelson	185	20,999	344,050	1,058,694	172,474	777	.....	68,800	103,780	550	1,241,462.25
Totals, 1970	1,199	138,632	2,366,765	1,187,322	317,129	9,520	500	70,700	385,880	4,225	$10,164,455.10
Totals, 1969	1,327	183,116	3,421,106	3,133,706	212,809	16,858	.....	4,500	1,583,644	4,685	$31,001,758.65
Totals, 1968	1,241	212,022	3,867,570	2,005,677	213,654	10,969	300	7,066	424,125	8,875	$24,293,171.92
Totals, 1967	1,149	242,011	4,231,926	2,528,440	160,540	8,816	1,750	7,515	210,930	12,584	$13,679,675.37
Totals, 1966	1,126	208,945	3,281,741	3,952,770	194,353	11,538	1,760	3,650	70,380	3,298	$14,166,872.69
Totals, 1965	1,614	384,850	5,594,617	1,900,163	428,920	16,766	150	13,200	540,860	14,658	$23,677,018.31
Totals, 1964	2,281	606,588	8,979,260	6,985,755	249,998	34,438	387	11,500	504,600	500	$37,209,392.28
Totals, 1963	2,183	534,569	7,687,783	4,123,192	501,980	16,300	1,155	9,800	172,950	3,180	$26,194,611.24
Totals, 1962	1,991	437,864	6,169,562	15,700,256	439,058	12,696	.....	10,442	272,000	220,930	$18,959,259.42
Totals, 1961	2,139	746,644	8,735,338	9,898,830	1,046,724	22,988	725	7,750	332,758	2,000	$22,599,089.53
Ten-year average, 1961–70	1,625	369,524	5,433,567	5,141,611	376,517	16,089	673	14,612	449,813	27,494	$22,194,530.45

(63)

AVERAGE STUMPAGE PRICES AS BID, BY SPECIES AND FOREST DISTRICTS, ON TIMBER SALES DURING 1970, PER CUNIT LOG SCALE

Forest District	Douglas Fir			Cedar			Spruce			Hemlock			Balsam		
	Volume (Cunits)	Price per Cunit	Price Range per Cunit	Volume (Cunits)	Price per Cunit	Price Range per Cunit	Volume (Cunits)	Price per Cunit	Price Range per Cunit	Volume (Cunits)	Price per Cunit	Price Range per Cunit	Volume (Cunits)	Price per Cunit	Price Range per Cunit
Vancouver	125,756	$14.51	$0.55–31.10	77,953	$5.06	$0.55–15.80	3,962	$8.37	$0.55–14.20	100,579	$5.28	$0.55–15.00	58,419	$6.06	$0.55– 9.70
Prince Rupert (C.)	10,010	11.65	.55–12.50	15,280	2.78	.55– 4.70	50,990	8.69	.55–17.70	107,970	8.06	.55–13.60	12,830	2.79	2.50– 2.80
Prince Rupert (I.)	.....	.....	.....	16,840	1.68	1.30– 2.90	23,550	2.01	.55– 3.90	111,450	1.55	.55– 2.80	13,760	1.39	.55– 2.00
Prince George	61,130	8.34	1.10–13.10	8,341	.76	.55– 2.10	590,400	2.96	.20– 7.50	12,750	1.00	.55– 1.30	60,310	1.29	.20– 4.50
Kamloops	122,870	4.49	.55–14.00	33,294	2.44	.55– 8.00	89,510	2.61	.55– 7.40	13,900	2.79	.55– 3.40	26,660	1.76	.55– 3.60
Nelson	17,280	3.71	.55– 5.40	20,140	2.68	.55– 5.50	158,020	4.14	.55– 7.30	48,600	1.26	.55– 9.40	55,630	1.83	.55– 5.30
All districts	337,046	$9.10	$0.55–31.10	171,848	$3.54	$0.55–15.80	916,432	$3.46	$0.20–17.70	395,249	$4.26	$0.55–15.00	227,609	$2.79	$0.20– 9.70

Forest District	White Pine			Lodgepole Pine			Larch			Other Species			All Species		
	Volume (Cunits)	Price per Cunit	Price Range per Cunit	Volume (Cunits)	Price per Cunit	Price Range per Cunit	Volume (Cunits)	Price per Cunit	Price Range per Cunit	Volume (Cunits)	Price per Cunit	Price Range per Cunit	Volume (Cunits)	Price per Cunit	Price Range per Cunit
Vancouver	672	$3.17	$3.10– 3.30	40	$2.30	$2.30– 2.30	.....	.....	.....	13,821	$4.78	$0.55– 8.60	381,202	$8.41	$0.55–31.10
Prince Rupert (C.)	.....	.....	.....	.....	.....	.....	.....	.....	.....	220	2.10	.55– 4.70	197,300	7.65	.55–12.50
Prince Rupert (I.)	.....	.....	.....	6,000	1.67	.55– 2.50	.....	.....	.....	2,330	1.50	.55– 2.10	173,930	1.52	.55– 3.90
Prince George	290	16.60	16.60–16.60	185,529	2.21	.20– 6.80	.....	.....	.....	2,180	1.42	.20– 3.50	920,930	3.01	.20–16.60
Kamloops	1,830	13.82	.55–25.70	48,953	2.02	.55– 3.60	3,395	$5.34	$3.70–11.00	8,940	2.26	.55–13.70	349,352	3.21	.55–25.70
Nelson	10,800	16.13	.55–26.40	20,460	3.78	1.20– 7.50	11,770	3.92	.55– 5.00	1,350	2.13	.55– 5.00	344,050	3.59	.55–26.40
All districts	13,592	$14.87	$0.55–26.40	260,982	$ 2.28	$0.20– 7.50	15,165	$4.24	$0.55–11.00	28,841	$3.31	$0.20–13.70	2,366,764	$4.28	$0.20–31.10

(64)

AVERAGE STUMPAGE PRICES RECEIVED, BY SPECIES AND FOREST DISTRICTS, ON TIMBER SCALED ON TREE-FARM LICENCE CUTTING PERMITS DURING 1970

Forest District	Douglas Fir			Cedar			Spruce			Hemlock			Balsam		
	Volume (Cunits)	Price per Cunit	Price Range per Cunit	Volume (Cunits)	Price per Cunit	Price Range per Cunit	Volume (Cunits)	Price per Cunit	Price Range per Cunit	Volume (Cunits)	Price per Cunit	Price Range per Cunit	Volume (Cunits)	Price per Cunit	Price Range per Cunit
Vancouver	145,436	$13.10	$0.55–16.40	315,557	$4.42	$0.55– 9.50	24,763	$7.74	$0.55–13.70	589,220	$4.42	$0.55– 7.50	312,679	$3.97	$0.55– 9.80
Prince Rupert	6	1.90	1.20– 3.20	97,494	1.65	.61– 2.40	142,014	3.68	1.07–11.40	275,074	1.71	.78– 5.60	67,400	1.46	.83– 3.40
Prince George	24,378	4.25	.80–10.10	9	1.92	.80– 3.20	93,353	2.87	1.50– 5.80	266	2.62	.80– 3.20	24,518	1.33	.70– 2.80
Kamloops	41,561	3.46	.55–25.20	5,833	2.57	.80– 5.90	99,153	2.39	.90–21.45	2,071	2.20	1.10– 3.60	21,585	1.04	.60– 5.70
Nelson	24,217	3.40	.55– 7.00	79,185	1.64	.55– 7.20	104,392	2.38	.55– 4.50	78,039	1.27	.55– 3.20	26,211	1.00	.55– 2.50
All districts	235,598	$9.49	$0.55–25.20	498,078	$3.42	$0.55– 9.50	463,675	$3.17	$0.55–21.45	944,670	$3.37	$0.55– 7.50	452,393	$3.14	$0.55– 9.80

Forest District	Lodgepole Pine			White Pine			Larch			Other Species			All Species		
	Volume (Cunits)	Price per Cunit	Price Range per Cunit	Volume (Cunits)	Price per Cunit	Price Range per Cunit	Volume (Cunits)	Price per Cunit	Price Range per Cunit	Volume (Cunits)	Price per Cunit	Price Range per Cunit	Volume (Cunits)	Price per Cunit	Price Range per Cunit
Vancouver	5	$2.45	$0.55– 3.00	4,564	$2.34	$0.55– 7.00	.....	.....	.....	31,230	$3.07	$0.55– 8.60	1,423,454	$5.23	$0.55–16.40
Prince Rupert	7,037	1.06	.77– 3.20	.....	.....	.....	.....	.....	.....	23,216	0.71	.60– 3.20	612,241	2.09	.60–11.40
Prince George	2,641	1.94	.70– 3.90	.....	.....	.....	.....	.....	.....	.....	.....	.....	145,165	2.83	.70–10.10
Kamloops	28,449	1.38	.80– 9.30	108	18.06	3.90–25.00	5,715	$3.72	$1.80– 4.70	989	2.86	2.00– 8.50	205,464	2.38	.55–25.20
Nelson	22,571	1.42	.55– 2.80	7,375	17.00	.55–22.60	20,392	3.62	1.60– 5.00	143	1.94	.60– 5.50	362,525	2.26	.55–22.60
All districts	60,703	$1.38	$0.55– 9.30	12,047	$11.46	$0.55–25.00	26,107	$3.64	$1.60– 5.00	55,578	$2.12	$0.55– 8.60	2,748,849	$3.80	$0.55–25.20

(65) TIMBER CUT AND BILLED FROM TIMBER SALES AND TIMBER SALE HARVESTING LICENCES, 1970

Forest District	Cubic Feet	Board-feet	Lineal Feet	Cords	Ties	Posts	Christmas Trees	Hop Poles	Car Stakes	Fence Rails, Palings	Slag Poles	Shingle Shakes	Shake Blanks
Vancouver	184,096,635	9,699,203	81,201	3,281	.....	8,123	.....	.....	115	.....	.....	4,379,241	222,782
Prince Rupert (C.)	50,165,195	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Prince Rupert (I.)	60,884,085	.....	21,455	110	.....	.....	.....	.....	.....	.....	.....	.....	.....
Prince George	312,706,179	.....	31,400	55	.....	8,222	.....	.....	.....	.....	.....	.....	.....
Kamloops	188,993,101	.....	588,846	702	.....	20,375	.....	.....	.....	.....	.....	.....	.....
Nelson	103,586,386	.....	1,195,107	179	.....	.....	446,549	.....	1,138	.....	.....	.....	643,649
Totals, 1970	900,425,581	9,699,203	1,918,009	4,327	.....	36,720	446,549	.....	1,253	.....	.....	4,379,241	866,431
Totals, 1969	804,857,059	6,250,091	3,280,599	7,046	.....	103,192	479,284	.....	3,494	2,441	61,829	5,676,051	1,856,028
Totals, 1968	714,384,574	6,416,864	3,862,509	7,819	.....	172,642	483,503	.....	3,751	.....	.....	4,369,011	1,133,289
Totals, 1967	619,335,789	6,083,295	6,107,876	8,719	.....	283,712	458,795	.....	6,277	.....	.....	3,264,427	553,397
Totals, 1966	712,773,314	7,705,804	8,254,946	12,558	.....	134,518	445,423	.....	2,303	.....	.....	4,296,938	379,893
Totals, 1965	728,521,327	13,198,159	5,732,671	14,576	.....	200,017	448,385	.....	9,454	.....	.....	4,795,873	395,119
Totals, 1964	729,684,953	42,643,124	5,840,321	19,047	.....	403,435	483,002	.....	3,302	9,260	.....	6,379,921	728,183
Totals, 1963	713,287,016	51,131,178	7,811,867	15,217	1,913	500,287	485,637	.....	5,643	88,721	.....	4,679,585	655,827
Totals, 1962	645,464,932	71,557,831	7,803,821	11,621	625	530,504	354,763	11,818	6,210	29,840	.....	4,678,254	503,049
Totals, 1961	575,338,601	117,488,982	10,403,972	8,362	25,761	564,443	500,764	9,496	6,873	.....	.....	4,622,529	776,010
Ten-year average, 1961–70	714,407,315	33,217,453	6,101,659	10,929	2,830	292,947	458,610	2,131	4,856	13,026	6,183	4,714,183	784,723

(66) WOOD-PROCESSING PLANTS OF THE PROVINCE, 1970

Forest District	Operating								Shut Down			
	Sawmills				Shingle-mills				Sawmills		Shingle-mills	
	Number	Estimated Eight-hour Daily Capacity, M B.F.	Number of Attached Chippers[1]	Number of Attached Barkers[1]	Number	Estimated Eight-hour Daily Capacity, M B.F.	Number of Pulp Mills[1]	Number of Veneer and Plywood Plants[1]	Number	Estimated Eight-hour Daily Capacity, M B.F.	Number	Estimated Eight-hour Daily Capacity, M B.F.
Vancouver	155	7,987	107	64	44	481	10	11	47	335	8	16
Prince Rupert	131	1,560	11	8	3	13	4	----	42	260	----	----
Prince George	236	5,617	44	46	2	12	3	5	102	590	----	----
Kamloops	277	5,969	46	56	6	14	1	5	15	124	----	----
Nelson	82	2,537	22	28	4	11	2	3	116	492	1	1
Totals, 1970	881	23,670	230	202	59	531	20	24	322	1,801	9	17
Totals, 1969	974	23,432	227	194	62	643	19	22	309	1,850	17	39
Totals, 1968	902	22,822	186	164	59	705	19	22	332	2,297	13	28
Totals, 1967	931	22,757	197	164	62	784	17	21	340	3,211	5	16
Totals, 1966	1,116	26,729	183	153	57	826	15	20	429	3,344	13	27
Totals, 1965	1,191	27,641	161	144	63	820	12	19	478	2,903	9	26
Totals, 1964	1,417	28,865	97	82	61	680	11	17	513	3,035	6	18
Totals, 1963	1,541	29,339	.....	.....	69	1,003	----	----	502	3,490	9	65
Totals, 1962	1,627	28,234	.....	.....	33	591	----	----	512	3,217	14	92
Totals, 1961	1,778	29,025	.....	.....	60	917	----	----	559	3,613	9	49
Ten-year average, 1961–70	1,236	26,251	.....	.....	58	750	----	----	430	2,876	10	38

[1] Figures not available prior to 1964.

(67) EXPORT OF LOGS (IN F.B.M.), 1970

Species	Grade No. 1	Grade No. 2	Grade No. 3	Ungraded and Lumber Reject	Total	Exportable[1]	Exported under Permit[2]
Fir	174,051	1,610,852	2,655,886	.....	4,440,789	1,535,857	2,904,932
Cedar	6,012,827	7,574,751	18,317,309	.....	31,904,887	6,376,990	25,527,897
Spruce	6,883,265	14,296,645	68,477,441	.....	89,657,351	4,360,551	85,296,800
Hemlock	4,745,321	14,331,853	64,426,376	.....	83,503,550	36,992,625	46,510,925
Balsam	.....	.....	.....	50,089,087	50,089,087	14,351,106	35,737,981
Yellow pine	.....	.....	.....	.....	.....	.....	.....
Lodgepole pine	52,971	508,206	1,208,445	.....	1,769,622	1,069,524	700,098
Cypress	1,463,159	7,087,885	24,949,957	.....	33,501,001	13,203,320	20,297,681
Hardwood	.....	.....	.....	288,181	288,181	244	287,937
Cottonwood	2,514	369,351	4,765,630	.....	5,137,495	2,844,184	2,293,311
Totals, 1970	19,334,108	45,779,543	184,801,044	50,377,268	300,291,963	80,734,401	219,557,562
Totals, 1969	3,592,972	18,188,084	103,624,904	30,241,684	155,647,644	63,932,092	91,715,552
Totals, 1968	21,717,373	26,897,011	120,670,517	16,173,878	185,458,779	97,590,782	87,867,997
Totals, 1967	12,128,244	41,320,799	128,995,437	20,972,835	203,417,315	68,513,476	134,903,839
Totals, 1966	9,751,031	27,322,739	88,001,394	16,931,247	142,006,411	44,092,921	97,913,490
Totals, 1965	3,355,224	10,766,201	35,846,770	8,640,629	58,608,824	38,753,555	19,855,269
Totals, 1964	3,748,377	14,590,533	30,789,610	3,825,697	52,954,217	28,446,668	24,507,549
Totals, 1963	3,468,986	16,149,811	62,790,210	10,382,520	92,791,527	51,109,835	41,681,692
Totals, 1962	3,773,734	11,215,447	46,151,663	13,839,528	74,980,372	44,255,041	30,725,331
Totals, 1961	9,216,534	28,611,982	48,009,763	15,513,919	101,352,198	31,272,030	70,080,168
Ten-year average, 1961–70	9,008,658	24,084,215	84,968,131	18,689,921	136,750,925	54,870,080	81,880,845

[1] Export privilege—exported from lands Crown-granted prior to March 13, 1906.
[2] Exported under permit from Crown lands and lands granted after March 12, 1906, under authority of section 97 of *Forest Act.*

(68) SHIPMENTS OF POLES AND OTHER MINOR FOREST PRODUCTS, 1970

Forest District and Product	Quantity Exported	Approximate Value, F.O.B.	Where Marketed		
			Canada	United States	Other Countries
Vancouver—					
Poles ... lin. ft.	6,693,808	$4,776,442.00	410,482	4,699,742	1,583,584
Piling ... ,,	449,006	1,248,045.00	42,274	119,828	286,964
Stakes and sticks ... ,,	6,817	340.00	.....	6,817	.....
Cedar shakes ... pieces	12,908,782	1,836,318.00	539,946	12,368,836	.....
Christmas trees ... ,,	16,767	31,020.00	329	16,438	.....
Fence-posts ... ,,	6,817	1,022.00	.....	6,817	.....
Pulp-chips ... units	184,698	3,867,576.00	.....	184,698	.....
Prince Rupert—					
Poles and piling ... lin. ft.	218,900	120,395.00	87,560	131,340	.....
Prince George—					
Poles ... ,,	182,695	123,303.00	113,253	69,442	.....
Fence-posts ... pieces	19,805	4,554.00	19,805	.....	.....
Pulp chips ... units	16,494	195,454.00	16,494	.....	.....
Kamloops—					
Poles ... lin. ft.	677,005	406,203.00	143,045	533,960	.....
Posts ... cords	36	1,620.00	.....	36	.....
Christmas trees ... pieces	162,460	121,845.00	21,999	140,461	.....
Nelson—					
Poles and piling ... lin. ft.	1,378,202	698,243.00	702,671	675,531	.....
Mine timbers ... ,,	93,416	22,420.00	93,416	.....	.....
Corral rails ... ,,	347,278	6,946.00	20,544	326,734	.....
Orchard props ... ,,	1,000	20.00	.....	1,000	.....
Fence-posts ... cords	4,760	249,900.00	4,342	418	.....
Mine props ... ,,	74	4,810.00	74	.....	.....
Palings and pickets ... ,,	91	4,095.00	91	.....	.....
Cordwood ... ,,	6	116.00	4	2	.....
Christmas trees ... pieces	977,555	742,942.00	164,641	812,914	.....
Shakes and shingles ... ,,	2,379,244	214,132.00	154,492	2,224,752	.....
Total value, 1970	.....	$14,677,761.00	.....	.....	.....
Total value, 1969	.....	$12,278,411.31	.....	.....	.....

(69) TIMBER MARKS ISSUED, 1961–70

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	10-year Average, 1960–69
Old Crown grants	268	300	313	356	328	341	277	328	361	220	309
Crown grants, 1887–1906	121	150	125	148	150	130	147	173	159	82	139
Crown grants, 1906–1914	121	164	161	164	172	144	163	190	203	111	159
Section 58, *Forest Act*	470	589	608	672	649	679	680	805	781	540	647
Stumpage reservations	117	109	141	149	133	63	61	48	48	19	89
Pre-emptions	3	9	13	7	8	3	6	9	13	10	8
Timber berths	4	12	12	9	14	10	4	1	11	6	8
Indian reserves	8	20	18	27	24	27	11	24	30	14	20
Section 24, *Forest Act*	.....	.....	.....	.....	.....	20	214	347	502	418	150
Timber sales	2,141	1,991	2,183	2,281	1,614	1,126	1,149	1,241	1,327	1,199	1,625
Special marks and rights-of-way	91	90	97	121	153	117	95	101	143	89	110
Pulp-leases	5	5	.....	.....	3	12	4	5	2	.....	4
Pulp licences	.....	2	.....	.....	.....	4	1	1	2	1	1
Totals	3,349	3,441	3,671	3,934	3,248	2,676	2,812	3,273	3,582	2,709	3,269
Transfers and changes of marks	691	809	725	802	740	908	593	773	554	686	728

(70) GRAZING PERMITS ISSUED, 1970

Forest District	Number of Permits Issued	Number of Stock Under Permit		
		Cattle	Horses	Sheep
Kamloops	1,176	144,621	3,346	2,525
Nelson	440	19,980	889	18
Prince George	389	13,578	1,416	196
Vancouver	4	153	.....	.....
Totals, 1970	2,009	178,332	5,651	2,739
Totals, 1969	2,018	180,579	5,545	5,106
Totals, 1968	2,053	188,183	6,338	7,090
Totals, 1967	2,114	188,126	6,837	6,272
Totals, 1966	2,244	189,286	6,572	8,970
Totals, 1965	2,218	188,339	6,677	12,509
Totals, 1964	2,104	173,677	6,231	22,478
Totals, 1963	1,951	158,840	5,860	25,366
Totals, 1962	1,924	146,830	5,007	23,370
Totals, 1961	1,825	132,749	4,985	21,309

(102) FIRE OCCURRENCES BY MONTHS, 1970

Forest District	March	April	May	June	July	August	September	October	Total	Per Cent
Vancouver	3	1	26	123	160	153	35	15	516	12.9
Prince Rupert	.....	8	18	50	41	12	3	1	133	3.3
Prince George	.....	10	34	101	152	77	20	15	409	10.2
Kamloops	6	43	243	392	767	550	73	43	2,117	52.9
Nelson	3	13	65	84	375	242	32	14	828	20.7
Totals	12	75	386	750	1,495	1,034	163	88	4,003	100.0
Per cent	0.3	1.9	9.6	18.8	37.3	25.8	4.1	2.2	100.0	.....
Ten-year average, 1961–70	23	64	334	429	693	658	168	25	2,394	.....
Per cent	1.0	2.8	13.9	17.9	28.9	27.5	7.0	1.0	100.0	.....

(103) NUMBER AND CAUSES OF FOREST FIRES, 1970

Forest District	Lightning	Recreational (Campers, Etc.)	Railroads Operating	Smokers	Brush-burning (Not Railway or Right-of-way Clearing)	Range-burning	Road, Power-, Telephone-, and Pipe-line Construction	Industrial Operations (Logging, Etc.)	Incendiary	Miscellaneous Known Causes	Unknown Causes	Total	Per Cent of Total Fires in Province
Vancouver	130	61	50	113	9	1	4	76	2	70	.....	516	12.9
Prince Rupert	21	24	1	21	6	10	1	21	4	24	.....	133	3.3
Prince George	160	61	14	37	37	7	2	37	8	37	9	409	10.2
Kamloops	987	119	97	259	75	171	17	86	52	240	14	2,117	52.9
Nelson	505	37	84	71	19	2	6	35	4	61	4	828	20.7
Totals	1,803	302	246	501	146	191	30	255	70	432	27	4,003	100.0
Per cent	45.0	7.5	6.1	12.5	3.6	4.9	0.7	6.4	1.7	10.9	0.7	100.0	.....
Ten-year average, 1961–70	895	227	163	296	101	127	50	175	37	279	44	2,394	.....
Per cent	37.4	9.5	6.8	12.4	4.2	5.3	2.1	7.3	1.5	11.7	1.8	100.0	.....

(104) NUMBER AND CAUSES OF FOREST FIRES FOR THE LAST 10 YEARS

Causes	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	Total
Lightning	1,426	615	1,144	277	1,000	374	958	708	646	1,803	8,951
Recreational (campers, etc.)	269	182	221	144	315	230	288	131	188	302	2,270
Railroads operating	154	41	65	51	89	170	455	121	238	246	1,630
Smokers	336	162	220	129	310	281	464	179	374	501	2,956
Brush-burning (not railway or right-of-way clearing)	86	60	82	66	89	156	128	65	133	146	1,011
Range-burning	179	62	95	79	193	149	138	53	128	191	1,267
Road, power-, telephone-, and pipe-line construction	36	35	24	11	89	101	93	34	52	30	505
Industrial operations (logging, etc.)	194	109	141	81	223	164	248	126	206	255	1,747
Incendiary	49	25	62	45	24	14	42	23	19	70	373
Miscellaneous known causes	290	183	250	178	309	292	348	193	313	432	2,788
Unknown causes	83	62	41	59	44	36	54	14	21	27	441
Totals	3,102	1,536	2,345	1,120	2,685	1,967	3,216	1,647	2,318	4,003	23,939

(105)

FIRES CLASSIFIED BY SIZE AND DAMAGE, 1970

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	516	12.9	312	60.5	13.9	165	31.9	12.0	35	6.8	10.7	4	.8	5.8	453	34	29
Prince Rupert	133	3.3	82	61.7	3.7	38	28.6	2.8	8	6.0	2.5	5	3.7	7.3	118	10	5
Prince George	409	10.2	185	45.0	8.3	152	37.0	11.1	57	14.0	17.5	15	4.0	21.7	348	34	27
Kamloops	2,117	52.9	1,161	54.8	51.9	734	34.7	53.5	189	8.9	58.0	33	1.6	47.8	1,872	161	84
Nelson	828	20.7	496	59.9	22.2	283	34.2	20.6	37	4.4	11.3	12	1.5	17.4	760	45	23
Totals	4,003	100.0	2,236	-------	100.0	1,372	-------	100.0	326	-------	100.0	69	-------	100.0	3,551	284	168
Per cent	100.0	-------	55.9	-------	-------	34.3	-------	-------	8.1	-------	-------	1.7	-------	-------	88.7	7.1	4.2
Ten-year average, 1961–70	2,394	-------	1,457	-------	-------	693	-------	-------	203	-------	-------	41	-------	-------	2,118	172	104
Per cent	100.0	-------	60.9	-------	-------	28.9	-------	-------	8.5	-------	-------	1.7	-------	-------	88.5	7.2	4.3

(106) DAMAGE TO PROPERTY OTHER THAN FORESTS, 1970

Forest District	Forest Products Cut, Logs, Lumber, Etc.	Buildings	Railway, Logging, and Sawmill Equipment	Miscel-laneous	Total	Per Cent of Total
Vancouver	$275,440	$350	$40,496	$5,126	$321,412	43.1
Prince Rupert	8,670	.....	.....	.....	8,670	1.2
Prince George	5,395	36,150	750	22,732	65,027	8.7
Kamloops	110,712	70,450	40,100	114,125	335,387	45.1
Nelson	.....	4,200	3,000	7,205	14,405	1.9
Totals	$400,217	$111,150	$84,346	$149,188	$744,901	100.0
Per cent	53.8	14.9	11.3	20.0	100.0	.....
Ten-year average, 1961–70	$185,583	$48,081	$155,805	$42,181	$431,650	.....
Per cent	43.0	11.1	36.1	9.8	100.0	.....

(107—Part I) DAMAGE TO FOREST COVER CAUSED BY FOREST FIRES, 1970—PART I[1]

Forest District	Merchantable Timber				Immature Timber	
	Net Area Killed	Total Volume Killed	Salvable Volume of Timber Killed	Net Stumpage Loss	Net Area Killed	Present Value
	Acres	M Cu. Ft.	M Cu. Ft.	$	Acres	$
Vancouver	2,641	12,613	4,736	419,809	2,902	154,288
Prince Rupert	235	619	353	5,066	30	1,068
Prince George	24,472	63,310	19,718	746,745	24,495	568,841
Kamloops	23,637	37,124	15,269	322,460	31,245	612,698
Nelson	8,703	30,621	16,398	393,252	4,551	139,285
Totals	59,688	144,287	56,474	1,887,332[1]	63,223	1,476,180[1]
Per cent	22.8	100.0	39.1	54.9	24.3	42.9
Ten-year average, 1961–70	46,935	92,420	35,517	1,796,703	60,553	1,434,032
Per cent	17.8	100.0	38.4	51.5	23.0	41.2

[1] The dollar value of losses in merchantable and immature timber represents only stumpage loss to the Crown. Actual payroll loss to the Province is 10 times these figures.

(107—Part II)

DAMAGE TO FOREST COVER CAUSED BY FOREST FIRES, 1970—PART II

Forest District	Not Satisfactorily Restocked				Noncommercial Cover		Grazing or Pasture Land		Nonproductive Sites		Grand Totals		
	Logged, Not Burned	Logged and Burned	Old Burn (Not Logged)	Damage	Area Burned	Damage	Area Burned	Damage	Area Burned	Damage	Area	Quantity	Damage
	Acres	Acres	Acres	$	Acres	$	Acres	$	Acres	$	Acres	M Cu. Ft.	$
Vancouver	2,128	358	1	1,508	507	125	1	.....	911	230	9,449	12,613	575,960
Prince Rupert	9,552	4	.....	3,351	77	19	24	2	51	13	9,973	619	9,519
Prince George	3,709	903	3,889	3,039	42,789	10,816	1,582	150	21,778	5,440	123,617	63,310	1,335,031
Kamloops	2,780	32	685	35,114	8,824	2,144	9,298	463	12,499	3,089	89,000	37,124	975,968
Nelson	5,266	.....	.....	5,757	4,994	1,183	455	20	4,950	1,230	28,919	30,621	540,727
Totals	23,435	1,297	4,575	48,769	57,191	14,287	11,360	635	40,189	10,002	260,958	144,287	3,437,205
Per cent	9.0	0.5	1.7	1.4	21.9	0.4	4.4	0.1	15.4	0.3	100.0	100.0	100.0
Ten-year average, 1961–70	14,822	2,335	8,392	221,193	94,240	23,975	11,767	1,787	24,393	6,199	263,437	92,420	3,483,891
Per cent	5.6	0.9	3.2	6.3	35.8	0.7	4.4	0.1	9.3	0.2	100.0	100.0	100.0

(*108*) FIRE CAUSES, AREA BURNED, FOREST SERVICE COST, AND TOTAL DAMAGE, 1970

Causes	Number	Per Cent	Acres	Per Cent	Cost	Per Cent	Damage	Per Cent
Lightning	1,803	45.0	128,704	49.3	4,564,367	49.7	1,650,672	39.4
Recreational (campers, etc.)	302	7.5	10,171	3.9	858,022	9.4	165,729	4.0
Railroads operating	246	6.1	4,744	2.3	227,935	2.5	178,107	4.3
Smokers	501	12.5	15,708	6.0	1,038,090	11.3	306,261	7.3
Brush-burning (not railway or right-of-way clearing)	146	3.6	13,524	5.2	119,156	1.3	110,664	2.6
Range-burning	191	4.9	22,730	8.6	205,088	2.3	74,116	1.8
Road, power-, telephone-, and pipe-line construction	30	0.7	516	0.1	13,786	0.2	8,040	0.2
Industrial operations (logging, etc.)	255	6.4	43,863	16.8	1,353,766	14.7	1,242,449	29.7
Incendiary	70	1.7	10,026	3.7	169,033	1.8	83,150	2.0
Miscellaneous known causes	432	10.9	10,358	4.0	499,988	5.5	350,044	8.4
Unknown causes	27	0.7	614	0.1	116,936	1.3	12,874	0.3
Totals	4,003	100.0	260,958	100.0	9,166,167	100.0	4,182,106	100.0

(109)

COMPARISON OF DAMAGE CAUSED BY FOREST FIRES IN LAST 10 YEARS

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	Total, 10 Years
Total number of fires	3,102	1,536	2,345	1,120	2,685	1,967	3,216	1,647	2,318	4,003	23,939
Area burned (acres)	1,227,159	45,617	46,346	7,746	307,132	54,788	244,483	33,381	406,763	260,958	2,634,373
Standing timber destroyed or damaged (M cu. ft.)	315,532	3,972	7,953	306	114,585	3,506	170,555	5,361	158,147	144,287	924,204
Amount salvable (M cu. ft.)	119,223	1,279	3,357	117	40,872	1,453	110,136	759	21,499	56,474	355,169
Damage to forests	$12,820,694	$311,445	$308,475	$25,793	$5,194,473	$757,017	$4,751,919	$455,872	$6,776,020	$3,437,205	$34,838,913
Damage to other forms of property	368,476	280,700	225,797	151,338	567,162	164,352	927,201	223,400	663,177	744,901	4,316,504
Total damage	$13,189,170	$592,145	$534,272	$177,131	$5,761,635	$921,369	$5,679,120	$679,272	$7,439,197	$4,182,106	$39,155,417

(110) FIRES CLASSIFIED BY FOREST DISTRICT AND COST PER FIRE OF FIRE-FIGHTING, 1970

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	Cost over $10,000 per Fire
Vancouver	516	898,608	9.8	1,741	42	8.1	1.0	474	91.9	11.8	194	163	73	9	35
Prince Rupert	133	209,035	2.3	1,571	32	24.1	0.8	101	75.9	2.5	36	50	9	4	2
Prince George	409	1,557,445	16.9	3,808	41	10.0	1.0	368	90.0	9.2	93	145	82	24	24
Kamloops	2,117	4,830,598	52.8	2,282	321	15.2	8.0	1,796	84.8	44.8	562	777	346	46	65
Nelson	828	1,670,481	18.2	2,380	103	12.4	2.6	725	87.6	18.1	271	284	126	19	25
Totals	4,003	9,166,167[1]	100.0	2,290	539	.....	13.5	3,464	.....	86.5	1,156	1,419	636	102	151
Per cent	100.0	.....	.....	.....	13.5	.....	.....	86.5	.....	.....	28.9	35.4	15.9	2.5	3.8
Ten-year-average, 1961–70	2,394	2,866,343	.....	1,197	583	.....	.....	1,811	.....	.....	902	632	190	35	52
Per cent	100.0	.....	.....	.....	24.4	.....	.....	75.6	.....	.....	37.7	26.4	7.9	1.5	2.1

[1] Cost correct to date, subject to later revision.

(111) AREAS OF LOGGING SLASH DISPOSED, 1970

Forest District	Acres Abated by Industry	Acres Abated by Forest Service	Total
Vancouver	68,722	.....	68,722
Prince Rupert	31,631	9,089	40,720
Prince George	14,800	7,000	21,800
Kamloops	13,768	2,696	16,464
Nelson	24,755	3,430	28,185
Totals	153,676	22,215	175,891

(141) FOREST REVENUE, 1966–70

	12 Months to Dec. 31, 1966	12 Months to Dec. 31, 1967	12 Months to Dec. 31, 1968	12 Months to Dec. 31, 1969	12 Months to Dec. 31, 1970
Timber licence rentals and fees	$771,170.84	$825,100.86	$676,038.52	$703,048.63	$668,254.04
Timber berth rentals and fees	14,368.52	13,436.63	141,074.38	128,103.62	123,123.68
Timber lease rentals and fees	106,852.12	76,121.31	87,083.55	90,500.60	92,895.76
Timber sale rentals and fees	948,568.96	881,812.16	899,849.28	882,229.95	898,484.23
Timber sale stumpage	42,643,936.30	34,732,239.51	44,390,570.94	78,293,115.07	53,524,665.01
Timber sale cruising and advertising	223,236.17	229,857.61	250,745.80	213,844.25	163,321.01
Timber royalties	3,079,058.68	3,509,720.06	4,954,555.27	6,329,417.22	6,217,109.85
Grazing permits and fees	153,507.63	310,718.84	350,351.93	384,123.83	438,003.68
Forest protection tax	570,202.65	579,928.17	947,389.12	993,509.64	1,006,742.58
Miscellaneous	245,350.02	394,388.82	473,324.50	428,260.52	669,194.53
Weight-scaling	212,275.98	396,894.14	635,742.30	1,033,160.25	1,149,637.48
Totals	$48,968,527.87	$41,950,218.11	$53,806,725.59	$89,479,313.58	$64,951,431.85

(142)

AMOUNTS CHARGED AGAINST LOGGING OPERATIONS, 1970

District	Royalty	Miscellaneous	Scaling Fund		Stumpage	Rentals, Cruising, Advertising, Transfer Fees	Total
			Scaling Expenses	Scaling Fees			
Vancouver	$4,180,178.43	$64,851.57	$380,844.91	$2,014,754.49	$23,059,284.82	$780,606.30	$30,480.520.52
Prince Rupert	1,035,719.13	261,224.40	49,237.03	227,917.88	4,923,174.25	322,729.07	6,820,001.76
Prince George	241,035.37	511,294.89	.....	.....	9,867,158.54	341,405.71	10,960,894.51
Kamloops	446,279.77	469,563.42	.....	.....	7,554,849.13	280,977.62	8,751,669.94
Nelson	199,071.07	173,767.09	.....	.....	4,637,647.43	273,173.04	5,283,658.63
Totals, 1970	$6,102,283.77	$1,480,701.37	$430,081.94	$2,242,672.37	$50,042,114.17	$1,998,891.74	$62,296,745.36
Totals, 1969	$6,394,215.18	$1,335,288.66	$417,010.41	$2,046,118.14	$80,270,727.23	$1,900,578.27	$92,363,937.89
Totals, 1968	$5,240,932.73	$215,421.57	$457,873.04	$1,960,676.35	$48,292,949.16	$1,868,711.35	$58,036,564.20
Totals, 1967	$3,097,283.30	$155,429.93	$460,492.24	$1,654,526.83	$33,111,713.22	$1,561,397.57	$40,040,843.09
Totals, 1966	$3,033,313.36	$34,552.21	$409,398.60	$1,685,787.86	$42,032,738.27	$1,567,023.40	$48,762,813.70
Totals, 1965	$2,599,335.52	$13,019.78	$325,333.63	$1,526,114.51	$42,997,720.01	$1,520,404.68	$48,981,928.13
Totals, 1964	$2,589,142.31	$9,757.95	$291,333.62	$1,141,321.90	$38,793,044.73	$1,381,881.96	$44,206,482.47
Totals, 1963	$2,399,042.45	$11,244.13	$243,745.53	$922,206.05	$30,470,629.50	$1,258,855.66	$35,305,723.32
Totals, 1962	$2,331,987.94	$8,727.97	$255,562.68	$1,006,764.72	$26,467,054.86	$1,224,600.21	$31,294,698.38
Totals, 1961	$2,135,102.82	$19,504.27	$219,118.42	$995,399.98	$23,463,080.72	$1,235,002.32	$28,067,208.53

(143) AMOUNTS CHARGED AGAINST LOGGING OPERATIONS, FISCAL YEAR 1969/70

District	Royalty	Miscel-laneous	Scaling Fund		Stumpage	Rentals, Cruising, Advertising, Transfer Fees	Total
			Scaling Expenses	Scaling Fees			
Vancouver	$4,758,012.45	$58,669.55	$424,458.53	$2,211,223.31	$31,409,013.00	$676,897.83	$39,538,274.67
Prince Rupert	1,113,211.62	227,746.64	39,170.92	162,572.63	7,046,449.25	242,512.46	8,831,663.52
Prince George	337,413.17	408,579.20	.....	.....	17,569,967.55	346,289.31	18,662,249.23
Kamloops	619,482.93	453,738.98	.....	.....	13,525,857.35	308,076.44	14,907,155.70
Nelson	280,992.69	213,522.61	.....	.....	8,102,599.02	281,082.73	8,878,197.05
Totals, 1969/70	$7,109,112.86	$1,362,256.98	$463,629.45	$2,393,795.94	$77,653,886.17	$1,854,858.17	$90,817,540.17
Totals, 1968/69	$5,606,697.44	$531,812.86	$430,176.61	$1,813,633.15	$57,086,138.53	$2,053,320.31	$67,521,778.90
Totals, 1967/68	$3,101,010.90	$167,243.61	$462,292.44	$1,730,158.05	$32,528,962.43	$1,435,377.37	$39,425,044.80
Totals, 1966/67	$3,014,116.07	$97,618.77	$418.649.05	$1,633,282.45	$38,999,030.55	$1,614,407.62	$45,777,104.51
Totals, 1965/66	$2,835,387.89	$12,951.13	$363,546.48	$1,683,900.58	$44,658,459.16	$1,586,928.06	$52,070,068.62
Totals, 1964/65	$2,528,753.61	$10,200.85	$287,344.41	$1,148,796.45	$40,402,430.17	$1,375,540.12	$46,570,174.53
Totals, 1963/64	$2,397,693.04	$10,103.02	$243,758.31	$933,939.47	$31,559,368.71	$1,271,232.39	$37,057,425.09
Totals, 1962/63	$2,334,087.65	$10,478.79	$255,471.80	$1,001,506.52	$27,535,735.53	$1,215,900.43	$33,017,030.65
Totals, 1961/62	$2,249,635.97	$18,336.53	$230,395.08	$1,006,719.97	$23,748,697.80	$1,256,074.86	$29,213,272.61
Totals, 1960/61	$2,259,260.15	$11,752.91	$229,465.79	$1,174,335.71	$25,525,797.36	$1,123,343.86	$30,618,051.15

(144) FOREST REVENUE, FISCAL YEAR 1969/70

Timber licence rentals and fees	$664,995.36
Timber berth rentals and fees	98,592.24
Timber lease rentals and fees	89,978.10
Timber sale rentals and fees	823,881.77
Timber sale stumpage	76,476,626.79
Timber sale cruising and advertising	225,870.84
Timber royalties	6,721,325.60
Grazing permits and fees	379,639.23
Forest-protection tax	917,602.47
Miscellaneous	507,744.21
Weight-scaling	1,066,932.63
Total	$87,973,189.24

(145) FOREST SERVICE EXPENDITURES, FISCAL YEAR 1969/70

General administration, protection, and management of forests	$17,441,491.82
Reforestation and forest nurseries	2,234,533.60
Forest research	182,565.46
Public information and education	61,148.18
Forest Service Training School	129,352.04
Grant to Canadian Forestry Association	17,500.00
Engineering services and forest-development roads	3,043,987.28
Fire suppression	3,855,169.76
Forest inventory	1,078,259.51
Silviculture	1,505,224.53
Grazing Range Improvement Fund[1]	180,844.08
Peace River community pastures	18,150.29
Forestry and Correction Camp Programme	12,978.64
Total	$29,761,205.19

[1] Statement provided elsewhere.

(146)

SCALING FUND

Deficit, April 1, 1969	$233,114.32
Collections, fiscal year 1969/70	2,640,206.48
	$2,407,092.16
Expenditures, fiscal year 1969/70	2,565,463.08
Deficit, March 31, 1970	$158,370.92
Collections, nine months, April to December, 1970	1,924,650.54
	$1,766,279.62
Expenditures, nine months, April to December, 1970	1,919,214.11
Deficit, December 31, 1970	$152,934.49

(147)

GRAZING RANGE IMPROVEMENT FUND

Surplus, April 1, 1969	$5,496.13
Government contribution (section 13, *Grazing Act*)	187,162.14
	$192,658.27
Expenditures, fiscal year 1969/70	180,844.08
Surplus, March 31, 1970	$11,814.19
Government contribution (section 13, *Grazing Act*)	189,819.61
	$201,633.80
Expenditures, nine months, April to December, 1970	158,034.78
Surplus, December 31, 1970	$43,599.02

(148)

PEACE RIVER POWER TIMBER SALVAGE

Expenditures, fiscal year 1969/70	$3,474,328.05
Recovered from British Columbia Hydro and Power Authority	1,686,610.33
Balance	$1,787,717.72

(151)

DISTRIBUTION OF PERSONNEL, 1970

Personnel	Vancouver[1]	Prince Rupert	Prince George	Kamloops	Nelson	Victoria	Total
Continuously Employed							
Deputy Minister, Chief Forester, and Assistant Chief Foresters	-----	-----	-----	-----	-----	4	4
Division Foresters	-----	-----	-----	-----	-----	6	6
Directors of Grazing and Public Information	-----	-----	-----	-----	-----	1	1
Forest Counsel and Personnel Officers	-----	-----	-----	-----	-----	3	3
District Foresters and Assistant District Foresters	2	2	2	2	2	-----	10
Foresters	15	10	15	15	10	103	168
Agrologists and Agrologists-in-Training	-----	-----	2	6	2	-----	10
Engineers	-----	1	2	1	1	31	36
Forest Protection Officers	3	1	2	1	2	5	14
Technical Forest Officers	107	87	123	125	115	47	604
Superintendent of Scaling and Assistants	15	-----	-----	3	-----	-----	18
Scalers, Official	95	3	71	3	-----	-----	172
Scalers, Official, temporary	65	30	-----	50	26	-----	171
Comptroller, Accountant, and Audit Assistants	-----	-----	-----	-----	-----	7	7
Engineering, Mechanical and Radio	6	3	4	7	3	18	41
Public Information Assistants	-----	-----	-----	-----	-----	3	3
Reforestation, Research, and Survey Assistants	-----	1	-----	4	1	48	54
Nursery Superintendents	-----	-----	-----	-----	-----	8	8
Draughtsmen and Mapping Assistants	5	5	6	6	4	29	55
Clerks, Stenographers, and Messengers	98	39	42	34	24	104	341
Superintendent and Foremen, Forest Service Maintenance Depot	8	-----	-----	-----	-----	1	9
Mechanics, Carpenters, and Technicians	43	9	7	5	5	70	139
Launch Crewmen	16	8	-----	-----	-----	1	25
Forest Assistants	39	31	38	47	22	18	195
Truck, Tractor, and Equipment Operators	13	3	1	3	1	20	41
Foremen	3	5	5	2	1	28	44
Miscellaneous[2]	23	4	2	10	3	78	120
Totals, continuous personnel	556	242	322	324	222	633	2,299
Seasonally Employed							
Technical Forest Officers	8	-----	-----	6	-----	1	15
Patrolmen	2	-----	-----	-----	2	-----	4
Lookoutmen	32	23	32	32	41	-----	160
Dispatchers, Radio Operators, and Clerks	-----	1	4	4	3	-----	12
Fire-suppression Crewmen	54	-----	17	69	30	-----	170
Reforestation—Snag-fallers, Planters, etc.	-----	-----	-----	-----	-----	1,975	1,975
Truck, Tractor, and Equipment Operators	-----	6	8	4	5	28	51
Student and Survey Assistants and Engineering Aides	24	-----	-----	22	-----	88	134
Forest Assistants	3	1	3	-----	19	88	114
Foremen	2	1	1	10	-----	66	80
Miscellaneous[3]	6	6	7	70	22	107	218
Totals, seasonal personnel	131	38	72	217	122	2,353	2,933
Totals, all personnel	687	280	394	541	344	2,986	5,232

[1] Includes Vancouver Scaling and Forest Service Maintenance Depot.

[2] Includes Analysts, Nursery Assistants, Programmer Analysts, Data Processing Operators, Key Punch Operators, Building Service Workers, Gardeners, Cooks, Flunkies, Labourers, Fallers, Painters, Plumbers, Powdermen, Photographers, Stockmen, Utility Tradesmen, Mechanic Welder, Timekeeper, Watchmen, Bridgemen, Carpenters, Power-saw Operators, Technicians, Construction Accountants, and Engineering Aides.

[3] Includes Labourers, Cooks, Flunkies, Launch Engineers, Power-saw Operators, Carpenters, Snag-fallers, Mix Masters, Swampers, Mechanics, Watchmen, Bridgemen, Rock-drillers, Launch Crew, and Boatmen.

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