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

1971

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1972

VICTORIA, BRITISH COLUMBIA, March 1972.

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 1971.

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 1971.

J. S. STOKES
Deputy Minister of Forests

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REPORT OF THE FOREST SERVICE, 1971

CHIEF FORESTER'S REPORT

In most respects, 1971 was a good year for the British Columbia Forest Service. Direct revenues collected from logging operations totalled $67,669,895—an increase of 8.6 per cent over 1970.

The total scale of all products in 1971 was 1,997,081,172 cubic feet—an increase of 3.2 per cent over the previous year; and the lumber market improved considerably throughout the year, with encouraging prospects for 1972. The pulp and paper sector, however, experienced a "soft" market and was forced to make cutbacks in production.

Steadily mounting public interest and concern over forest land uses resulted in the firming-up of "balanced use" policies and special attention to forest recreation plans and administration.

Other highlights of 1971:

- A record 43,846,400 seedlings were planted on 102,177 acres by the Forest Service and industry—an increase of 9,835,300 trees over 1970. Planting on Crown land in the Interior more than doubled.
- The United States continues to be our best customer for forest products—taking more than 60 per cent of our total production, and some 70 per cent of our lumber. Japan and the United Kingdom took 12 and 9 per cent respectively, while Australia remains our fourth best customer.
- Plywood and shingle production showed increases, and reflected increased housing activity throughout most of North America.
- The greatest single problem for industry was undoubtedly in the pulp and paper segment, which experienced a "soft" market throughout the year. Production of chips exceeded demand.
- Capital expenditure committed for the construction of new wood-processing plants and for additions to existing ones neared the $595 million mark. Approximately $250 million of that amount was for additions to pulp and paper mills.
- There were 2,898 forest fires throughout the Province in 1971, and the direct cost of fighting them was approximately $11.7 million—the highest cost tag on record. The fires burned approximately 878,000 acres, which compares with a 10-year average of 263,000 acres.
- Despite increased demands for divergent use of Crown grazing land, its use by domestic stock continued at the same level as in 1970. Improved management increased forage production and integration of grazing with other uses.
- Among major engineering projects completed during 1971 was the construction of a bridge across the Nass River near Meziadin Lake. It provides access between the Northern Trans-Provincial Highway and the Stewart–Cassiar Highway, providing the town of Stewart with its first land access to the rest of the Province.
- Pondage clearance operations continued with another 10,000 acres treated at Williston Lake, bringing the total to 95,000 acres; and plans have been made for a postflooding clean-up programme to salvage usable timber and dispose of floating debris.

- An additional 13,000 acres of the Mica pondage were cleared, bringing the total to 38,000, with 11 miles of road relocated and constructed. Pre-flood operations will be completed during 1972, with flooding scheduled for the spring of 1973.
- Forest inventory surveys were continued on proposed and approved public sustained-yield units, and detailed information is now available on 115 million acres—compared to 97 million in 1970.
- Forest land in 14 public sustained-yield units was placed under reserve and gazetted as Provincial forests in 1971. The total land under reserve is now 114,075 square miles, and another nine forest reserves are being processed.
- Research continues into the development of stock for the regeneration of harvested areas throughout the Province, and a forest land classification system has been developed for the mapping of forest land. It will provide a framework for intensive forest management.
- Effective January 1, 1972, all log production in the Province will be measured in terms of firmwood cubic feet instead of board feet.
- The Forest Service's responsibility for forest recreation has been firmly established, with a Recreation Forester appointed in Victoria to co-ordinate the new function. A small staff has been added to each forest district to implement recreation plans and procedures, and their initial duties include the compiling of a recreation inventory for each district.
- Close-utilization operations continued to increase, and by year's end an estimated 72 per cent of the total Provincial cut was in accordance with the "close-u" standard.
- Marine hazards were reduced with the collection of more than 7 million cubic feet of drift logs under the Log Salvage Regulation—an increase of 1.6 million cubic feet over 1970.
- At the request of the Select Standing Committee on Forestry and Fisheries, concentrated investigations were made into the floating and beach wood debris problem, with detailed reports expected early in 1972.
- Log exports accounted for 28 million cubic feet (about 1 per cent of the total Provincial cut), compared with 50 million cubic feet in 1970.
- Detailed planning commenced on the formation of a sixth forest district. The Cariboo Forest District will incorporate the southern portion of the Prince George District and northern sections of the Kamloops District, and will be fully operational by 1973. Headquarters will be at Williams Lake.
- The Provincial summertime student employment programme saw an additional 560 people employed by the Forest Service. They enabled Rangers to complete many outstanding projects, and many of the students provided valuable assistance in fire-fighting operations.
- The Service's public relations programme devoted particular emphasis to the theme of balanced use of forest resources.

WESTERN WHITE PINE

inventory division

INVENTORY DIVISION

HIGHLIGHTS

With the continuation of unit standard surveys over approved and proposed public sustained-yield units (PSYU's), such information is now available on 115,000,000 acres.

Loss-factor work continued in northern British Columbia in the Blueberry and Moberly PSYU's.

Stand-table information on number of trees per acre by diameter class, snags per acre, vets per acre in immature, etc., has been provided for all areas surveyed since 1968.

The remeasurement cycle was commenced on permanent sample plots when nine 10-year-old plots were remeasured in the Prince George Forest District.

1971 PROGRESS

Classification of forest-cover types, sampling of mature and immature stands, derivation of loss factors, and determination of the growth and yield of immature stands continued throughout 1971.

The Division completed field work to unit standard on four public sustained-yield units and a part of a fifth, one proposed special sale area, one proposed sustained-yield unit, and the Aleza Lake Forest Reserve. A total of 15,547,540 acres was brought to unit standard.

Table A—1971 Field Work

Unit Standard Inventory

Public Sustained-yield Unit, Special Sale Area, Etc.	Maps Classified	Number of Samples		Total Estimated Acreage
		Mature	Immature	
Aleza Lake Forest Reserve	3	51	8	19,666
Dawson Creek SSA	163	140	194	3,897,025
Eagle	24	173	230	389,456
Kingcome (Broughton portion)	90	66	85	1,190,748
Longworth	68	355	51	1,257,779
Quesnel Lake	106	234	243	2,125,169
Sikanni (proposed)	206[1]	164	218	4,408,092
Takla (northern portion)	105	206	96	2,259,605
Totals	765	1,389	1,125	15,547,540

[1] Map scale of 1 inch=40 chains, remainder 20 chains.

Loss Factors

Arrowhead	-------	5	-------	-------
Blueberry	-------	13	-------	-------
Kinbasket	-------	4	-------	-------
Moberly	-------	15	-------	-------
Nakusp	-------	5	-------	-------
Totals	-------	42[2]	-------	-------

[2] Felled samples.

Table A—1971 Field Work—Continued

Growth and Yield

Public Sustained-yield Unit, Special Sale Area, Etc.	Maps Classified	Number of Samples		Total Estimated Acreage
		Mature	Immature	
Initial measurements—				
Cottonwood	.....	.....	6	.....
Naver	.....	.....	94	.....
Parsnip	.....	.....	52	.....
Willow River	.....	.....	14	.....
Remeasurements—				
Narcosli	.....	.....	4	.....
Nicola	.....	.....	5	.....
Totals	.....	.....	175[3]	.....

[3] Permanent remeasurable samples.

Radio communications improved in northern regions with portable single side-band transceivers being used in fly camps for the first time.

More than 170 personnel were employed on field projects, including 95 seasonal employees.

Three helicopters operated on four-month contracts, logging over 1,100 hours on field projects, approximately 725 hours on forest classification flights, and nearly 300 hours for transporting sampling crews to remote areas.

Table B—Production of Final Forest-cover Maps for 1970 Projects

Public Sustained-yield Unit	Number of Maps	Forest and Nonforest Area in Acres			Volume in Cunits for Mature Crown Area
		Crown	Alienated	Total	
Barton Hill	13	162,173	5,692	167,865	4,385,540[1]
Botanie	66	1,298,414	134,069	1,432,483	13,024,100[1]
E & N Crown (unregulated)	47	148,925	.....	148,925	349,090[2]
Fort St. James SSA	6	24,640	25,136	49,776	400,410[1]
Furry Creek SSA	4	18,984	5,905	24,889	659,780[2]
Kotcho (proposed)	244	5,513,175	1,202	5,514,377	*2,900,000[1]
Moberly	96	1,889,393	127,322	2,016,715	20,738,420[1]
Nicola	59	950,883	267,342	1,218,225	10,282,250[1]
Stikine (proposed)[3]	69	5,018,268	17,262	5,035,530	26,935,820[1]
Stuart Lake	67	1,510,800	27,726	1,538,526	25,591,910[1]
Takla (southern portion)	33	*853,342	*854	*854,196	*10,745,800[1]
Vancouver	58	550,367	419,988	970,355	13,279,340[2]
Totals	762	17,939,364	1,032,498	18,971,862	129,292,460

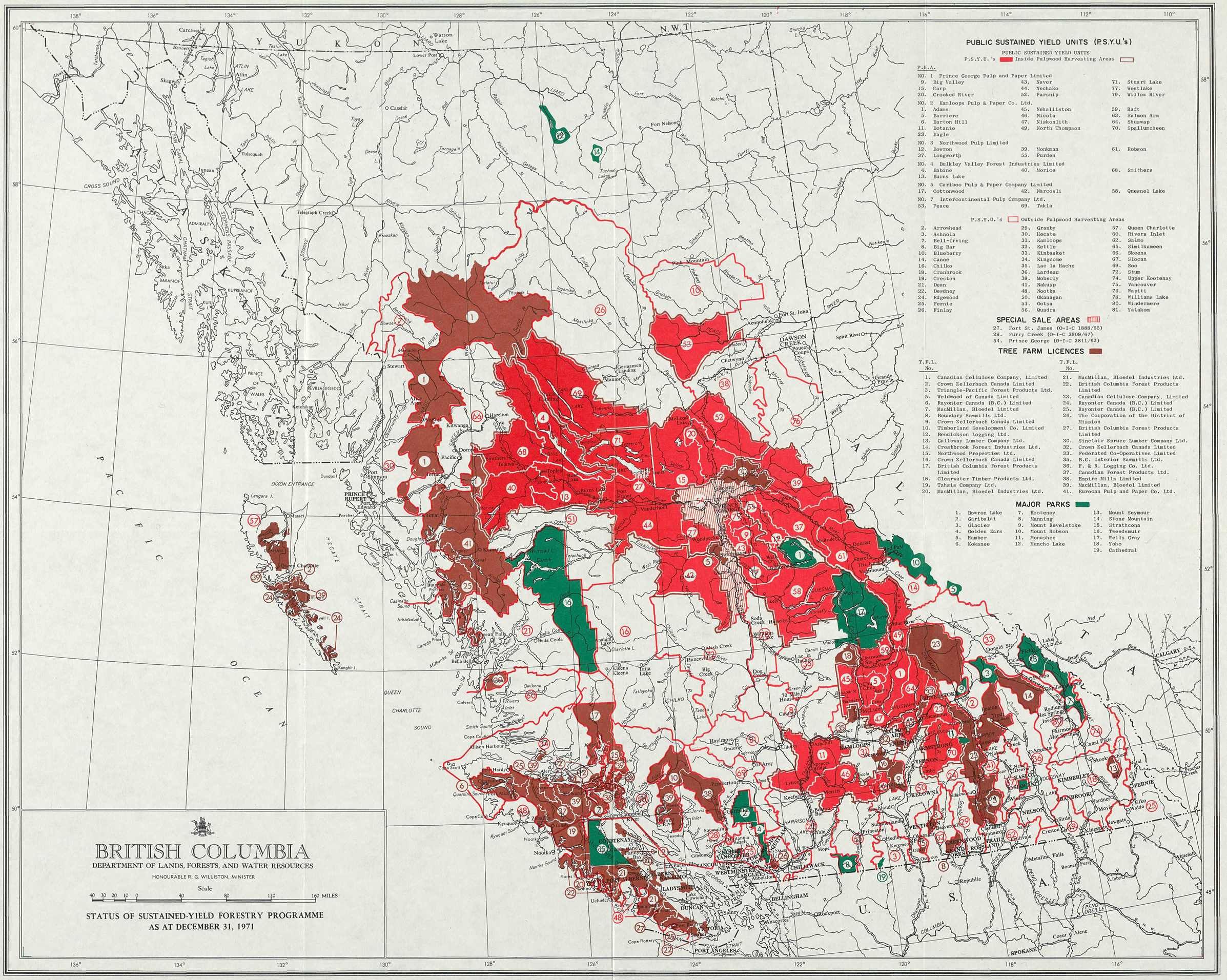
* Estimates.
[1] Volume at 7.1"+d.b.h. close utilization less decay.
[2] Volume at 9.1"+d.b.h. close utilization less decay.
[3] Map scale of 1 inch=40 chains.

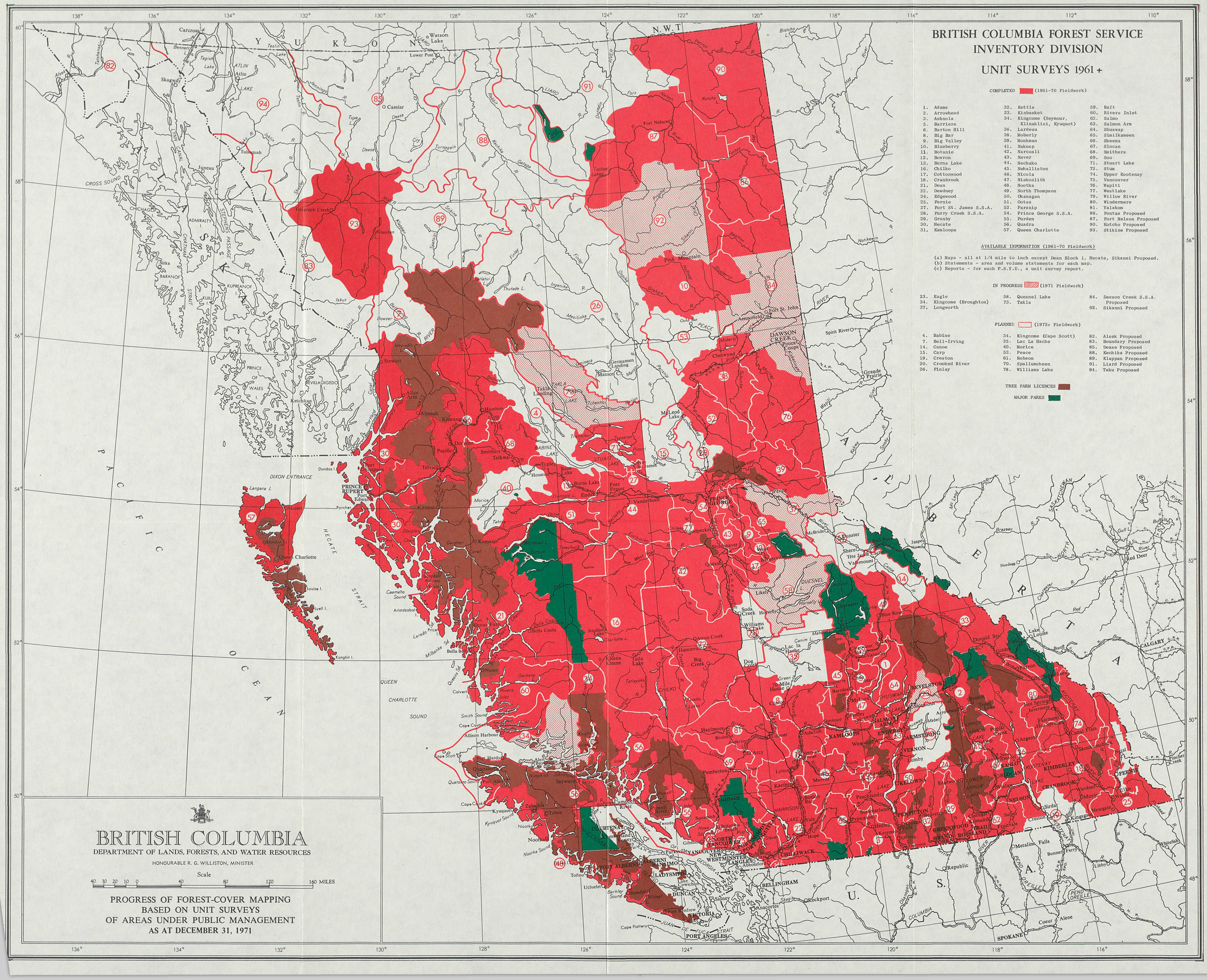
Decay studies continued in the hemlock-cedar wet belt of the Kinbasket and Nakusp PSYU's. Northern units studied included the Moberly and Blueberry PSYU's with two independent smaller crews.

Local loss-factor groupings for cedar and hemlock in Zones 4 and 6 were produced:

Zone 4—Longworth-Robson.

Zone 6—Eagle-Okanagan-Salmon Arm-Spallumcheen.


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, 1971
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 Company 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
31. Kamloops
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)
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 Sawmills Ltd.
9. Crown Zellerbach Canada Limited
10. Timberland Development Co. Limited
12. Bendickson Logging Ltd.
13. Galloway Lumber Company Ltd.
14. Crestbrook Forest Industries Ltd.
15. Northwood Properties Ltd.
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
Y U K O N
N.W.T.
ALASKA
PACIFIC OCEAN
QUEEN CHARLOTTE SOUND
HECATE STRAIT
DIXON ENTRANCE
CROSS SOUND
PRINCE OF WALES I.
Prince Rupert
Vancouver
Victoria
Kamloops
Prince George
Dawson Creek
Fort St. John
Fort Nelson
Cassiar
Stewart
Terrace
Kitimat
Nanaimo
Nelson
Cranbrook
Kimberley
Trail
Penticton
Kelowna
Vernon
Salmon Arm
Revelstoke
Golden
Fernie
Kaslo
Nakusp
Williams Lake
Quesnel
Lillooet
Ashcroft
Merritt
Hope
Chilliwack
Abbotsford
Langley
Bellingham
Port Angeles
Spokane
Coeur d'Alene
Calgary
Banff
Lake Louise
Radium Hot Springs
Fairmont Hot Springs
Grande Prairie
Spirit River
Pink Mountain
Tuchodi Lakes
Tulsequah
Telegraph Creek
Atlin
Skagway
Juneau
Sitka
Ketchikan
Masset
Queen Charlotte
Port Hardy
Tofino
Ucluelet
Port Alberni
Nanaimo
Courtenay
Campbell River
Port Alberni
Ladysmith
Duncan
Sidney
Port Alberni
Port Angeles
Cape Flattery
Bella Coola
Bella Bella
Kitimat
Prince Rupert
Port Simpson
Port Edward
Dorreen
Pacific
Smithers
Telkwa
Hazelton
Kitwanga
Alice Arm
Stewart
Manson Cr.
Germansen Landing
Fort Fraser
Vanderhoof
Burns Lake
Topley
Houston
Tatla Lake
Kleena Kleene
Alexis Creek
Hanceville
Big Creek
Lac la Hache
Clinton
Cache Creek
Ashcroft
Spences Bridge
Lytton
Merritt
Princeton
Keremeos
Oliver
Osoyoos
Grand Forks
Greenwood
Rossland
Trail
Castlegar
Nelson
Kaslo
Slocan
Creston
Cranbrook
Kimberley
Fernie
Elko
Waldo
Invermere
Golden
Revelstoke
Salmon Arm
Sicamous
Kamloops
Clearwater
Barriere
Chu Chua
Vernon
Kelowna
Summerland
Penticton
Oliver
Osoyoos
Grand Forks
Greenwood
Rossland
Trail


BRITISH COLUMBIA FOREST SERVICE
INVENTORY DIVISION
UNIT SURVEYS 1961 +
COMPLETED (1961-70 Fieldwork)
1. Adams
2. Arrowhead
3. Ashnola
5. Barriere
6. Barton Hill
8. Big Bar
9. Big Valley
10. Blueberry
11. Botanie
12. Bowron
13. Burns Lake
16. Chilko
17. Cottonwood
18. Cranbrook
21. Dean
22. Deadney
24. Edgewood
25. Fernie
27. Fort St. James S.S.A.
28. Furry Creek S.S.A.
29. Granby
30. Hecate
31. Kamloops
32. Kettle
33. Kinbasket
34. Kingcome (Seymour, Klinaklini, Kyuquot)
36. Lardeau
38. Moberly
39. Monkman
41. Nakusp
42. Narcosli
43. Naver
44. Nechako
45. Nehalliston
46. Nicola
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
58. Quesnel Lake
59. Raft
60. Rivers Inlet
62. Salmo
63. Salmon Arm
64. Shuswap
65. Similkameen
66. Skeena
67. Slocan
68. Smithers
69. Soo
71. Stuart Lake
72. Stum
74. Upper Kootenay
75. Vancouver
76. Wapiti
77. Westlake
79. Willow River
80. Windermere
81. Yalakom
86. Fontas Proposed
87. Fort Nelson Proposed
90. Kotcho Proposed
93. Stikine Proposed
AVAILABLE INFORMATION (1961-70 Fieldwork)
(a) Maps - all at 1/4 mile to inch except Dean Block 1, Hecate, Sikanni Proposed.
(b) Statements - area and volume statements for each map.
(c) Reports - for each P.S.Y.U., a unit survey report.
IN PROGRESS (1971 Fieldwork)
23. Eagle
34. Kingcome (Broughton)
37. Longworth
58. Quesnel Lake
73. Takla
84. Dawson Creek S.S.A. Proposed
92. Sikanni Proposed
PLANNED (1972+ Fieldwork)
4. Babine
7. Bell-Irving
14. Canoe
15. Carp
19. Creston
20. Crooked River
26. Finlay
34. Kingcome (Cape Scott)
35. Lac La Hache
40. Morice
53. Peace
61. Robson
70. Spallumcheen
78. Williams Lake
82. Alsek Proposed
83. Boundary Proposed
85. Dease Proposed
88. Kechika Proposed
89. Klappan Proposed
91. Liard 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, 1971
Y U K O N
N.W.T.
ALBERTA
PACIFIC OCEAN
QUEEN CHARLOTTE SOUND
DIXON ENTRANCE
HECATE STRAIT
CROSS SOUND
PRINCE OF WALES I.
PRINCE RUPERT
Terrace
Kitimat
Prince George
Quesnel
Williams Lake
Kamloops
Vernon
Kelowna
Penticton
Nelson
Cranbrook
Kimberley
Fernie
Trail
Grand Forks
Greenwood
Revelstoke
Salmon Arm
Chilliwack
Vancouver
New Westminster
Victoria
Nanaimo
Port Alberni
Courtenay
Campbell River
Port Hardy
Prince George
Fort St. John
Dawson Creek
Fort Nelson
Fort St. James
Burns Lake
Smithers
Hazelton
Stewart
Atlin
Dease Lake
Watson Lake
Lower Post
Cassiar
Telegraph Creek
Juneau
Ketchikan
Sitka
Skagway
Carcross
Bella Coola
Bella Bella
Tofino
Ucluelet
Port Alberni
Ladysmith
Duncan
Port Angeles
Bellingham
Spokane
Coeur d'Alene
Calgary
Edmonton
Grande Prairie
Peace River
Fort Nelson
Dease
Stikine
Liard
Finlay
Peace
Fraser
Columbia
Kootenay
Okanagan
Thompson
Nicola
Similkameen
Kettle
Okanagan
Shuswap
Nechako
Stuart
Quesnel
Chilcotin
Cariboo
Lillooet
Kootenay
Columbia
Pend Oreille
Spokane
Kootenay
Okanogan
Chilliwack
Vancouver
Victoria
Nanaimo
Courtenay
Port Alberni
Port Hardy
Prince Rupert
Terrace
Kitimat
Prince George
Quesnel
Williams Lake
Kamloops
Vernon
Kelowna
Penticton
Nelson
Cranbrook
Kimberley
Fernie
Trail
Grand Forks
Greenwood
Revelstoke
Salmon Arm
Fort St. John
Dawson Creek
Fort Nelson
Fort St. James
Burns Lake
Smithers
Hazelton
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Atlin
Dease Lake
Watson Lake
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Cassiar
Telegraph Creek
Juneau
Ketchikan
Sitka
Skagway
Carcross
Bella Coola
Bella Bella
Tofino
Ucluelet
Port Alberni
Ladysmith
Duncan
Port Angeles
Bellingham
Spokane
Coeur d'Alene
Calgary
Edmonton
Grande Prairie
Peace River
Fort Nelson
Dease
Stikine
Liard
Finlay
Peace
Fraser
Columbia
Kootenay
Okanagan
Thompson
Nicola
Similkameen
Kettle
Okanagan
Shuswap
Nechako
Stuart
Quesnel
Chilcotin
Cariboo
Lillooet
Kootenay
Columbia
Pend Oreille
Spokane
Okanogan
Chilliwack
Vancouver
Victoria
Nanaimo
Courtenay
Port Alberni
Port Hardy
Prince Rupert
Terrace
Kitimat
Prince George
Quesnel
Williams Lake
Kamloops
Vernon
Kelowna
Penticton
Nelson
Cranbrook
Kimberley
Fernie
Trail
Grand Forks
Greenwood
Revelstoke
Salmon Arm
Fort St. John
Dawson Creek
Fort Nelson
Fort St. James
Burns Lake
Smithers
Hazelton
Stewart
Atlin
Dease Lake
Watson Lake
Lower Post
Cassiar
Telegraph Creek
Juneau
Ketchikan
Sitka
Skagway
Carcross
Bella Coola
Bella Bella
Tofino
Ucluelet
Port Alberni
Ladysmith
Duncan
Port Angeles
Bellingham
Spokane
Coeur d'Alene
Calgary
Edmonton
Grande Prairie
Peace River
Fort Nelson
Dease
Stikine
Liard
Finlay
Peace
Fraser
Columbia
Kootenay
Okanagan
Thompson
Nicola
Similkameen
Kettle
Okanog

The growth and yield section constructed 10 zonal volume-over-age curves, mostly in Zone 4. In addition, 56 local curves were prepared, using data from the Fontas, Kotcho, Moberly, Stikine, Stuart, and Vancouver PSYU's. Forty-three diameter-over-age curves were also drawn for the above-listed public sustained-yield units. The former curves provide mean annual increment, and the latter average tree diameters for growth types at any stand age.

Work continued on the compiling of stand-table information for all units surveyed in 1968, 1969, and 1970.

Approximately $24,000 was received from the sale of 18,097 maps, reports, Xerox prints, and *Forest Inventory Statistics 1967,* an increase of over $5,000 since 1969.

A total of 19,899 maps was supplied to the Forest Service and other departments; while 32,269 reductions printed in the new 1860 Xerox were supplied to forest districts, other departments, and the public.

DEVELOPMENTS

In 1971 the forest land in 14 public sustained-yield units was placed under reserve and gazetted as the Barton Hill, Bell-Irving, Canoe, Kettle, Lardeau, Monkman, Nicola, Niskonlith, Okanagan, Parsnip, Salmo, Skeena, Slocan, and Spallumcheen Forests. Another nine forest reserves are being processed.

No 70-mm. photos were taken in 1971 for the Inventory Division. However, an inventory standing samples system programme was developed to compute standing samples, using 70-mm. photos. Output will include individual tree listing and individual sample volume statement.

More than 9,000 acres of privately held forest property within the Kingcome PSYU were examined for real-property assessment by the Inventory Division on behalf of the Department of Finance.

Volume and depletion studies in wet-belt cedar will be rounded out with sampling in the Quesnel PSYU. Loss-factor work will be extended in the north in the Klappan and Finlay PSYU's. Growth and yield work will continue in the Kamloops Forest District.

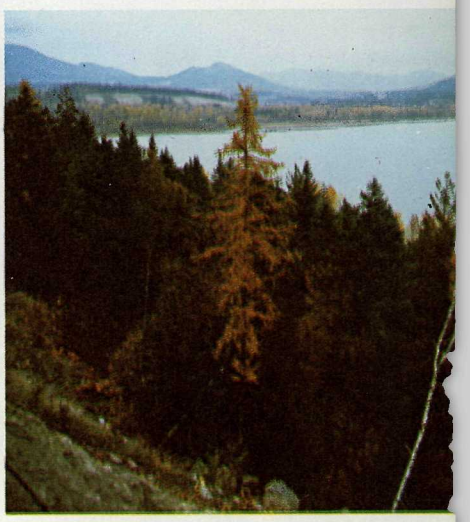
It is planned to produce stand-table information for all future unit surveys.

The land-use planner will continue to correlate pertinent ecological and recreational information as unit surveys are conducted.

The Division's warehouse at Green Timbers was destroyed by fire on December 26, with building and equipment losses estimated at $400,000.

WESTERN LARCH

research division



RESEARCH DIVISION

A detailed report on the research programme for 1971 will appear in the *Forest Research Review* compiled at the end of the fiscal year.

TREE-IMPROVEMENT STUDIES

The clone-bank area is constantly being improved. Twenty acres of a logged area at the Cowichan Lake Experiment Station and 13 acres on the North Arm Forest on the opposite side of the lake were cleared by complete stumping and burning. The fence was extended at the experiment station and is now enclosing the total area west of Station Road, approximately 210 acres. On the North Arm clearing a fence was built along the highway.

The office building was remodelled and an additional room was provided for pollen extraction and cone-drying. A workshop was constructed in the existing storage shed.

A major thinning for the first time was undertaken in the clone-banks, which had close spacing between the ramets. Criteria for this thinning was graft compatibility and flower production. On 2 acres of the thinned area, where the ramets were 10 years or older, topping of all remaining ramets at approximately 15 feet height was conducted. This is an attempt to develop bushy trees that will produce flowers closer to the ground, thus making controlled pollinations easier.

The anticipated crop of reproductive buds matured on the clone bank at the Forest Experiment Station and a start was made on a controlled pollination programme. Crosses were made for progeny testing and for use in a second-generation selection scheme. A total of 8,458 female strobili was isolated from 83 clones, while 95 pollen lots were handled. A four-pollen tester mating design was used to provide some comparisons of general combining ability of the plus-tree clones, while crosses were made on a wider basis for selection and inclusion in the first replacement seed orchards planned by the Reforestation Division. As part of the co-ordinated approach, Tahsis Company made available the buds of their Saanich orchard where a further 1,250 female strobili from 34 clones were isolated. Sufficient seed is now available to start the nursery phases.

The Research Division also co-operated with the Reforestation Division to complete the collection of wind-pollinated seed from trees at high elevations in the Fraser Valley and Pemberton areas for the Dewdney seed orchard. Collections were made from 80 trees well distributed over the zone.

A further nine test-sites were planted with racial crosses of Douglas fir on Vancouver Island and the Lower Mainland in the spring of 1971. This makes a grand total of 28 established since 1966. The early results from the test-sites planted with 1+1 seedlings in 1966 were measured in the autumn of 1971. Some of the progeny of these crosses are already more than 16½ feet high.

A limited number of pollinations was made. Investigations into the occurrence of dwarfing in the Douglas fir is continuing.

Nine test-sites of a provenance study of coastal Douglas fir were planted in the spring of 1971. Height measurements of 66 provenances were obtained at the Port Renfrew test-site, and additional test-sites were prepared for planting in 1972.

Studies of genetic variation in *Pinus contorta* continued with a morphometric examination of needle samples from mature trees and their progeny. Among the several characters evaluated, stomatal density (the number of stomates per unit area) appears to be strongly heritable as well as highly correlated with seed source.

This trait is now being used taxonomically to evaluate variation in a range-wide collection of 144 provenances.

The study will eventually incorporate data from tree-ring analyses on an extensive collection of increment cores. Sponsored by the Forest Service, this work is being carried out at the University of British Columbia under the direction of a member of the Faculty of Forestry.

First-season survival of 30 *contorta* provenances, planted at test-sites in the Prince George, Nelson, and Vancouver Forest Districts, exceeded 99 per cent at all locations, and marked growth differences between provenances were recorded. Seed of another 150 provenances has been sown at the Red Rock nursery for more comprehensive field trials.

Plants representing 886 families and provenances have been selected and prepared for planting in breeding arboreta at Red Rock and Lake Cowichan. Part of the stock remaining from these selections was planted in randomized blocks on a 50-acre test-site near Prince George.

After one season, 81-per-cent average take was recorded among 3,000 ramets representing 75 plus trees from northern British Columbia and Yukon Territory. These had been grafted in early spring on three-year-old potted rootstock at Red Rock. Approximately 5,000 rootstocks have been prepared to receive scions from another 75 plus trees from north-central British Columbia. Wind-pollinated seed was collected and has been processed for use in the progeny-trial evaluation of parent trees.

At the Red Rock Nursery and Research Centre a small laboratory was completed in the basement of the administration building where research seed lots can be counted, germination tests made, and cold storage provided. Construction of a lath house was commenced and the foundation was completed in December.

In co-operation with the Reforestation Division, approximately 375 acres of the 5,000-acre Red Rock Reserve on the west side of the Fraser River were cleared and prepared for planting of spruce and pine seed orchards and a breeding arboreta.

Some 200,000 Interior spruce seeds were sown from 138 plus trees of the Smithers Selection Unit. Nearly 20 per cent of the trees from this unit produced seeds with low germinability.

A plantation-site was prepared for the first progeny test of plus trees in the Prince George Selection Unit.

Cones were collected from 110 of the 132 plus trees of the East Kootenay Selection Unit.

Analyses of the heights of the 2-year-old progenies to be used in this test indicated a possible 15-per-cent height-growth gain if only the top 35 per cent of the seedlings were selected for seed production.

The 13th meeting of the Committee on Forest Tree Breeding in Canada was hosted by the Research Division in Prince George in August. More than 40 delegates from Canada and the United States attended the four-day convention.

SEEDLING PHYSIOLOGY STUDIES

Field work on the study of N uptake by 10-year-old Douglas fir trees was completed and chemical analysis of samples commenced. This experiment is an extension of work which showed that seedlings of Sitka spruce, white spruce, western hemlock, and Douglas fir tend to grow faster on ammonium sources of nitrogen than on nitrate sources of nitrogen.

A year-long test has shown that the 1 kiloherz: 1 megaherz impedance ratio gives a good indication of severity of frost damage in Douglas fir, and the method

was used to help the Reforestation Division estimate nursery losses due to "unseasonal" frosts on the Coast during September 1970. An electronically controlled thermostatic device was designed (with assistance from the University of Queensland) and built to control air temperature to $\pm 1\,^{\circ}C$ over the range $8\,^{\circ}C$ to $-25\,^{\circ}C$ and is now in use for determining absolute frost-hardiness of seedlings.

Continuing work with herbicides has shown that triazine compounds, particularly "Propazine," are very effective and economical in controlling weeds in seedbeds at one coastal nursery, where excellent results were obtained on several acres.

A chemical laboratory for soil and plant-tissue analysis was added to the existing laboratory at North Road in Victoria.

SOIL CLASSIFICATION

A one-week course was given to approximately 100 Government and company foresters to facilitate the application of the British Columbia Forest Service Land Classification System, A Mapping and Interpretation System for the Forested Lands of British Columbia (Research Note 54).

Assistance was given to Crown Zellerbach, Rayonier, and British Columbia Forest Products foresters in mapping their land.

Approximately 20,000 acres of the Kitimat Valley were mapped for species suitability—a framework for species trials and operational reforestation practices.

ECOLOGY

Analyses of vegetational data by the association method of Williams and Lambert produced promising results, but this method is expensive in computer time and limited in the quantity of data that can be analysed. Dissimilarity analysis of Macnaughton-Smith was selected for trial. This method was first applied to synthetic models and then to small lots of data. The resulting classifications are satisfactory, computing time much less, and larger quantities of data can be analysed. Data from vegetation plots in the Fort Nelson area were analysed and are being recorded to illustrate the method. Data from 735 vegetation plots in the north-central Interior have been prepared for analysis.

DATA PROCESSING

A Forest Service request for computer equipment to replace the IBM 1440 system located in the Vancouver Scaling Office led to a series of discussions with systems analysts of the Department of Industrial Development, Trade, and Commerce. The desire of the Department of Industrial Development, Trade, and Commerce personnel was to replace the IBM 1440 with a teleprocessing link to their data centre in Victoria. Equipment in the Victoria data centre was to be upgraded to handle the extra work load. Forest Service personnel assisted Department of Industrial Development, Trade, and Commerce systems analysts by explaining the existing system until the request for an upgrade of equipment was turned down. It was decided to postpone further systems design until a change of equipment had been approved.

The Forest Service decided to stop scaling logs in foot board measure and lumber cubic feet effective January 1, 1972. On October 1, 1971, the selling price used for calculating Coast stumpage rates was to be reported in firmwood cubic feet instead of foot board measure. This led to a series of administrative changes to ensure continued service. Management officers were assisted in planning the

changes in duties of personnel. New computer programmes were designed to incorporate these changes and to change some data records.

Approximately 27,000 data and programme cards were punched. Most of the programmes were already developed, except the dissimilarity analysis, which is a new programme, used to group similar plant communities based on presence and absence of a maximum of 200 different species.

The calculation of elements used in our soil and tissue analysis tests is also computerized. A new version of this programme eliminates hand interpolation of concentration values and accepts readings from new analytical laboratory equipment.

Assistance has been given to reforestation in the evaluation of container planting trials which involved several thousand survival assessment and growth measurements.

SILVICULTURE

Kamloops

Three projects were initiated to study aspects of lodgepole pine stand management.

The first is a long-term project to determine optimum tree-spacing in natural stands. The second is to observe the effects of logging method, size of clearcut, and preparation of seed-bed in natural regeneration. The third is a series of short-term studies to assess the effects of grass sowing on establishment and survival of pine seedlings within clearcut and clearcut-burned areas.

Container planting trials were completed in the field and previous trials are being reassessed. The performance of spruce and lodgepole pine is promising, particularly in plugs, but containerized seedlings of Douglas fir failed to survive as well as bare-root seedlings of this species. It is believed the seedlings were grown too long in containers prior to out-planting.

There is no significant difference in the cost per stocked spot between mattock-planted trees and direct seeding of spots using the Panama seeder, even on sites more arduous to plant that spot-sow. Costs are higher for planting, but these are offset by the greater number of stocked spots and their better spacing in comparison with the direct-seeding method.

In connection with the Cedar-Hemlock Rehabilitation project, a tally of surviving seedlings on two areas which had been direct-seeded near Enderby and Golden indicated broadcast sowing with untreated Douglas fir seed had been successful. However, spot-sowing on the same sites resulted in unexplainably poorer stocking.

Nelson

A trial of bareroot versus bullet and styroplug stock, using both Douglas fir and spruce, was established during the fall of 1970 and the summer of 1971 in the Lardeau District. By the fall of 1971 the spruce styroplugs had the highest percentage survival. The Douglas fir was heavily attacked by rabbits in all three plots, with the rabbits apparently preferring the containerized stock over the bareroot stock.

A study was initiated into the pattern of cedar and hemlock seed released onto snow. Previous studies have shown at least 75 per cent of the seeds are released onto snow, but lack of access prevented investigation into that aspect of their ecology. The present location at Murphy Creek is accessible throughout the winter.

A replication of a 30-provenance trial of lodgepole pine was established at Negro Creek. The provenances represent almost the complete range of pine in the Province. Other replications are in the Prince George District and on Vancouver Island.

Prince George

The northern replication of the 30-provenance trial of lodgepole pine was established successfully at Cluculz Lake.

A number of provenance planting-stock and container planting trials was reassessed.

The Douglas fir provenances planted at Valemount last year suffered high mortality.

There was no difference in the height growth of 1+1 and 2+0 P1 stock, but the survival of the transplants was better five years after planting.

Re-examination of container planting indicated styroplug stocks had the best survival, followed by bareroot and bullet-planted stock. The survival of spruce was best on a site where shade was provided by salmonberry.

Prince Rupert

A well-scarified area at Salvus was broadcast seeded with Sitka spruce and preliminary examination of one of the three seeded blocks revealed promising results. A full assessment will be done in 1972 to evaluate the effect of reinvading brush on stocking.

FOREST PRODUCTIVITY COMMITTEE

A major activity of this committee is the co-ordination of research connected with production of yield tables for stands subjected to specific silvicultural treatments.

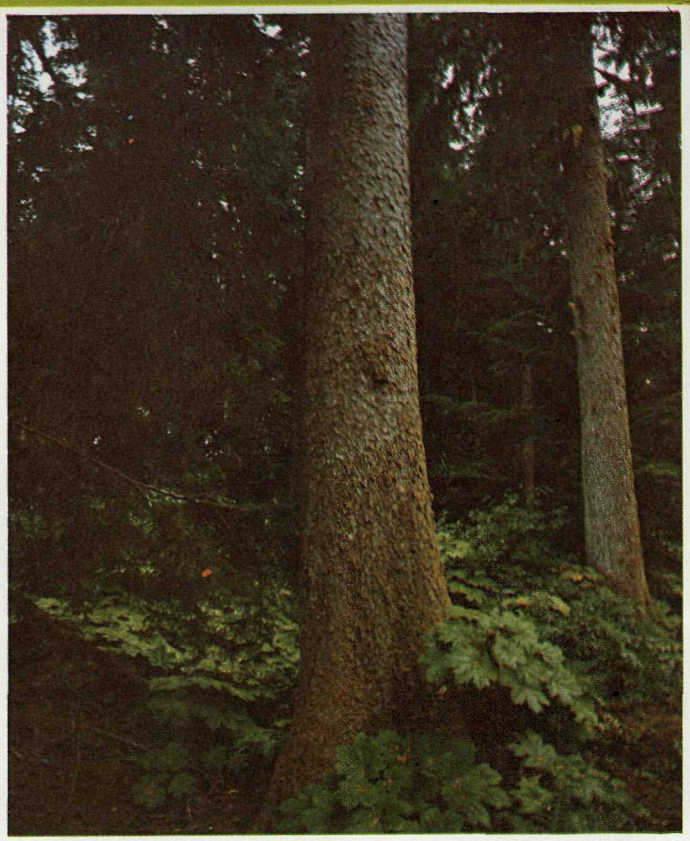
A working plan has been prepared for the establishment of approximately 200 experimental installations in the Vancouver Forest District. These installations are designed to test growth responses of Douglas fir and western hemlock stands to two thinning intensities and two levels of nitrogen fertilizer application. Combined thinning and fertilizer treatments will also be tested. It is based on experience gained in establishment of two pilot installations in the summer of 1971; one was located in a 60-year Douglas fir mixed stand at the Cowichan Lake Experiment Station, the other in a 28-year Douglas fir plantation in the Sayward Forest. It is intended that, with industry co-operation, both experimental and operational scale trials will be established.

Further information on the programme of the committee is contained in a brochure *The Functions and Programme of the Forest Productivity Committee.*

Local universities and Federal research organizations are being encouraged to participate in the programme—to include establishment of basic research projects designed to complement and (or) explain growth-response information from Forest Service and industry trials. The committee and the UBC Faculty of Forestry have recently entered into agreement involving four research studies on different aspects of forest productivity. These studies will involve research in variable density yield tables, taper-based volume summaries, crown development, and climatic cycles.

The Canada Land Inventory, Climatology Division, is planning a network of climate stations for the Vancouver Forest District, and has offered to include sites selected for Forest Service fertilizer/thinning trials in this network. After discussion and co-ordination through the British Columbia Forest Service Climatology Co-ordinating Committee, a climate-station programme was designed for the Forest Productivity Committee and all other British Columbia Forest Service user divisions.

reforestation division



SITKA SPRUCE

REFORESTATION DIVISION

FOREST TREE SEED

Flower and seed crops were generally poor in 1971. The Nelson Forest District, which had a complete crop failure in 1970, produced by far the best crop for any area during 1971. This is reflected in the cone collections made and summarized as follows:

Cone Collections Made in 1971

(Amount in Bushels)

Forest District	F	S	L	Pl.	Total
Vancouver	362.5	.....	.....	.....	362.5
Prince Rupert	.....	.....	.....	1,798.5	1,798.5
Prince George	.....	.....	.....	262.5	262.5
Kamloops	.....	.....	.....	135.0	135.0
Nelson	1,966.0	1,359.0	199.5	18.0	3,542.5
Totals	2,328.5	1,359.0	199.5	2,214.0	6,101.0

Extraction and cleaning were completed in December, but yields are not yet tabulated.

The extraction of the 1970 collections was completed early in 1971 and produced 2,523.315 kilograms of seed.

Yields of Seed From 1970 Collections

Forest District	Fir		Hemlock		Spruce		Total	
	Bushels	Kilograms	Bushels	Kilograms	Bushels	Kilograms	Bushels	Kilograms
Vancouver	720.0	138.480	.....	.....	426.5	109.905	1,146.5	248.385
Prince Rupert	22.5	2.060	53.0	20.135	3,199.0	800.980	3,807.0	906.145
					532.5[1]	82.970		
Prince George	231.5	45.095	.....	.....	3,243.5	1,168.465	3,475.0	1,213.560
Kamloops	429.0	88.560	.....	.....	256.0	64.660	685.0	153.220
Nelson	6.0	0.825	.....	.....	6.0	1.180	12.0	2.005
Totals	1,409.0	275.020	53.0	20.135	7,663.5	2,228.160	9,125.5	2,523.315

[1] Sitka spruce.

In addition, the winter collection of lodgepole pine during 1970/71 totalled 5,713.5 bushels and produced 399.870 kilograms of seed.

Summary of Winter 1970/71 Collections of Lodgepole Pine Seed

Forest District	Bushels	Kilograms
Vancouver		
Prince Rupert	1,099.5	54.715
Prince George	2,575.5	191.915
Kamloops	1,450.5	107.140
Nelson	588.0	46.100
Totals	5,713.5	399.870

A considerable amount of lodgepole pine is being collected during the winter of 1971/72 (estimated at 2,500 bushels) and will be extracted early in 1972.

The seed centre at Duncan processed 20,953 bushels of cones.

The amount of seed weighed and treated at the Duncan Seed Centre for sowing in 1971 amounted to 1,471.672 kilograms (3,238 lb.). In addition, 1,042 seed tests (209 new, 641 retests, 192 research) were completed. Extra retesting was required to update seed records following recleaning over the gravity table. All Forest Service Douglas fir seed lots were recleaned in 1971 and a total of 50 special requests involving 164 seed lots was processed. A seed-yield study for several British Columbia conifers was also completed.

Tree seed in storage at the end of 1971 is equivalent to 19¾ tons.

	Amount in Kilograms
British Columbia Forest Service seed	12,812.745
Company and private seed	3,910.895
	16,723.640

At the Campbell River Seed Orchard a total of 1,062 female cones were bagged and 569 full-cross cones were recovered. This poor showing was due to declining vigour caused by overgrowth of the phloem tissue in two clones. In addition, 70 flowers were bagged at the Koksilah clone bank and 59 cones were collected. The seed from these crosses will eventually produce trees for testing and the next phase of the orchard. Routine maintenance was carried out at the Koksilah, Campbell River, and Snowdon Orchards. A pollen flight study was also undertaken at the Koksilah Orchard to determine the amount and pattern of pollen flight from wild trees adjacent to the orchard.

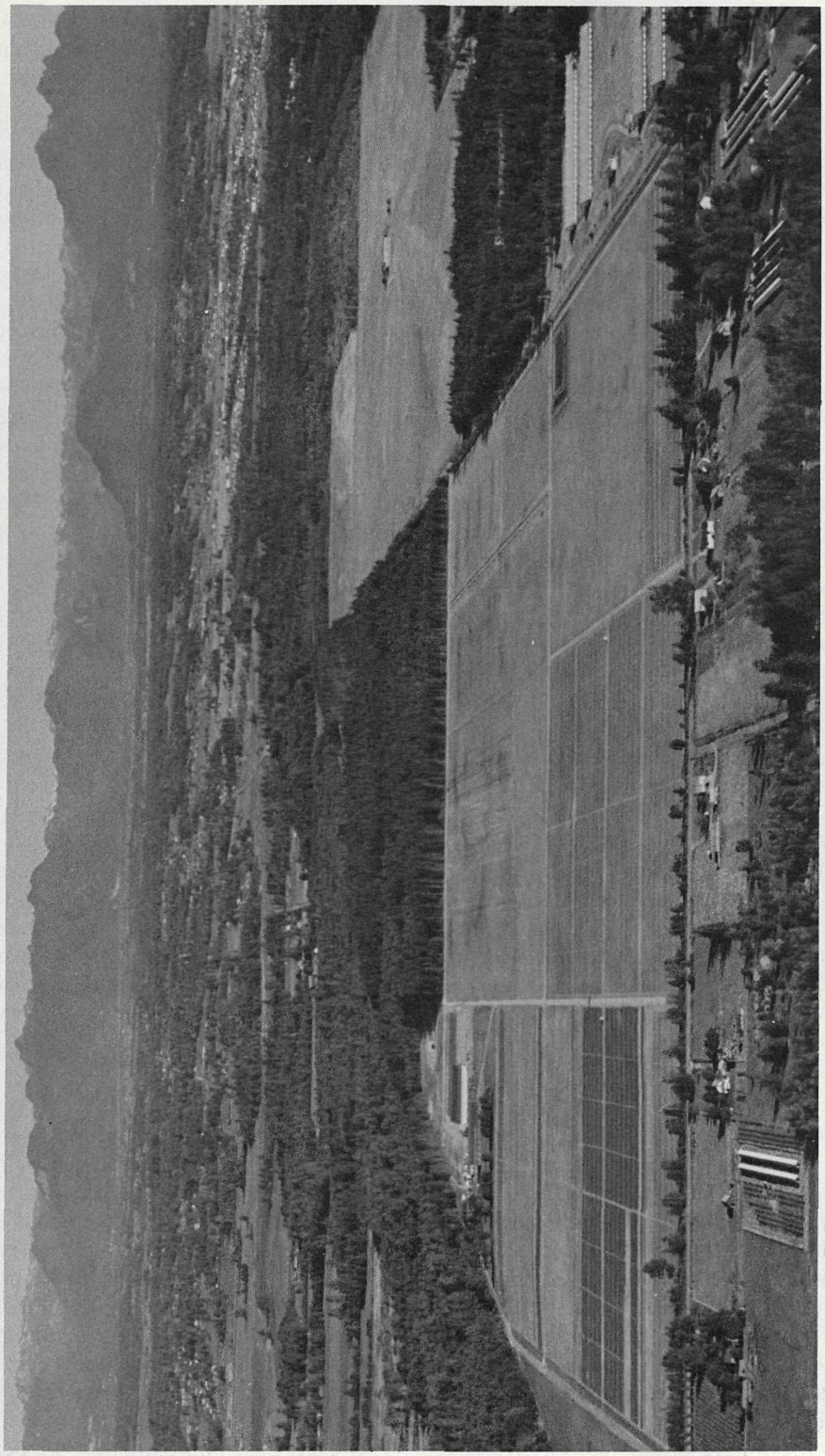
Field collection of seed from selected trees for the Dewdney Seed Orchard was continued in 1971. Seed for a total of some 138 selected trees (57 collected in 1970) for this orchard will be sown in 1972.

Initial development at the northern seed orchard and access to it was undertaken during the year, and part of the area will receive genetic stock in 1972.

There was no major increase in seed-production areas, but considerable improvement was accomplished in two forest districts. Trials with topping and high pruning were initiated on two areas in the Prince George District and S.P.A. G-3 (spruce) near Wansa Lake was expanded by 4 acres. No collections were made from any of the Prince George areas as there was no crop of Douglas fir or spruce in the north. In the Vancouver District, cleaning and pruning was completed on 5 acres of S.P.A. V-5 (Sechelt) and 7,640 pounds of fertilizer were applied to a total of 19 acres which were scheduled for treatment this year. A total of 183 bushels of Douglas fir cones was collected from treated areas, whereas only 164 bushels were collected from an equivalent but untreated area. No data are available on the relative seed yield per bushel from the treated and untreated areas.

FOREST NURSERIES

Good fallow area preparation plus favourable spring weather led to early seed-bed preparation and sowing at most nurseries in 1971. Subsequent germination and growth were excellent and little difficulty is anticipated in attaining the 70 million trees scheduled for 1973. The total of 939,435 lineal feet (177 miles) of bed sown in 1971 should provide trees for late 1972 and early 1973 planting projects.



Surrey Forest Nursery, located 3 miles southeast of Cloverdale. The largest of seven bareroot nurseries, capable of producing 40 million two-year-old seedlings annually on a three-year rotation when fully developed.

There were production setbacks at several nurseries due to such problems as insects, water shortages, and unfavourable weather conditions. The 1972 growing period should overcome these setbacks and, barring serious overwintering losses, the required number of trees should be available for planting.

Cold-storage difficulties and growth problems in the spring of 1971 resulted from the mid-September frost in 1970. More damage was sustained than was realized, with the consequence that vegetative buds failed to burst and stock moulded in storage. Forest Service nurseries in 1971 produced 52.8 million trees (including containers), of which 44 million were shipped and 7.8 million were transplanted. The remainder are presently in cold storage. This is an increase in production of 17.3 million over 1970 (49 per cent).

The development of a container nursery at Surrey was among the highlights of 1971. The volume of container-grown stock was increased from 750,000 in 1970 to over 7,152,000 in 1971 as a step toward developing the necessary growing techniques, to assess the problems of mass production and transportation, and to replace 1969 sowing losses at Red Rock. Approximately 931,000 containerized seedlings were grown at Duncan and 6,221,000 at Surrey. Over 4,084,000 of these were shipped during the year and the balance is scheduled for shipment in 1972. Pilot container nurseries have been established at Vernon, Telkwa, and Red Rock to test the feasibility of growing container stock under Interior environmental conditions.

At the request of the Attorney-General's Department and for reasons of economy, the Rayleigh Nursery was phased out during 1971. In addition, the total inventory of lodgepole pine and larch at this nursery was lost to sulphur fumes resulting from a train derailment that ignited several carloads of sulphur. The ponderosa pine which survived is not considered to be of plantable quality and its size makes transplanting difficult.

Capital development both for new facilities and additional nursery space continues to be an important part of the reforestation expansion programme. Cold-storage facilities have been developed to handle 35 million trees. Implement sheds, water systems, storage buildings, fences, etc., have been constructed as required.

At Campbell River, Surrey, and Chilliwack, approximately 75 acres were cleared for seed-bed and transplant space, bringing the total productive space available at all nurseries to 460 acres. Approximately 2½ miles of nursery road were constructed, and at Duncan 2 acres were reclaimed and bark-fibre sediment from a hydraulic barker pond at Lake Cowichan is being tested as a peat substitute for organic material. Red Rock rough-cleared an additional 10 acres for temporary transplant space.

RECONNAISSANCE AND SURVEY WORK

Despite demands of the 1971 fire season on field staff, District regeneration survey crews were able to cover considerable ground. This was due, in part, to a system of pre-classification of suspect areas which was employed by the Prince George Forest District. In this method, areas are quickly stratified by means of a minimum number of well-distributed sample plots. Portions that are found to be either well stocked or which are definitely understocked are mapped as such with no further examination. This permits more time examining areas where the degree of restocking is doubtful. Using this system, Prince George District crews were able to study some 38,800 acres, an increase of 8,700 acres over 1970. About 5,000 acres required planting, and of this, 72 per cent will require some form of site preparation.

Elsewhere in the Interior, crews examined a total of 58,508 acres, of which 15,819 acres were unsatisfactorily restocked. However, only approximately 17 per

cent of the nonstocked area is unplantable owing to slash, brush, or other impediment. In summarizing the results of these surveys it is evident there has been a gradual reduction in the amount of area requiring treatment before planting. This is thought to be due to the closer utilization and the increase in prescribed burning of the cutovers in the Interior over the past few years. In most cases crews were unable to get much work done on the areas burned by large fires in 1971.

In the Vancouver Forest District, survey crews examined 34,566 acres and found 31,892 acres unsatisfactorily stocked. Of this total, 27,301 are suitable for planting and will be scheduled for planting in 1972. The balance of the areas examined are either restocked or considered likely to restock by natural means.

In addition to the above areas of current interest, there are many thousands of acres of backlog area which have, over the years, become brushed-in or poorly restocked. Most of these older areas will require considerable work before they are in suitable condition for artificial reforestation, and many of them are presently inaccessible. One such area is the 30,000-acre Van Fire north of Babine Lake and to which the Nilkitwa Forest Road is being constructed. It is expected planting in this burn will commence by 1974.

PLANTING

Above-average snow-packs, common at higher elevations in the early spring, suggested a late start for tree-planting projects in 1971. However, warm and moist weather during the latter part of March and in early April hastened snow melt so that, despite a week's delay in getting started, crews were able to commence more projects concurrently than was anticipated. The hot, dry weather in late April and early May threatened to shorten the planting season, but spring rains finally arrived, at least in the southern part of the Province, and continued well into July.

In the case of most forest districts, nursery overruns provided extra stock, and with the favourable weather planting continued into July in the Interior. These circumstances enabled all agencies to reach a record total of 43,846,000 trees planted on 102,177 acres. Of this total, Forest Service planting on Crown lands amounted to 25,076,200 trees (57.3 per cent of the total) on 53,745 acres (Appendix Table 22). It is significant that Crown land planted in the Interior was more than doubled from the previous year in both number of trees and acres. Not included in the acreage total is 1,151 acres which were replanted after the West Fire burned 2,300 acres of earlier plantation in the Prince George Forest District. Some replanting of burned plantation in the Sue Fire near Golden was also undertaken.

During the year, 4,523,000 trees were planted by contractors, and this represented about 18 per cent of the Forest Service programme.

The average number of tenders received on each contract increased over 1970, indicating a healthy interest in these projects. Contract prices compared favourably with estimated costs. In the spring some difficulty was experienced on several areas and those contract projects had to be taken over by Forest Service crews. Revisions of tendering and other procedures are expected to prevent a recurrence of such situations. Twenty-four contracts, totalling almost three million trees, have been scheduled for the spring of 1972.

As expected, planting by timber sale harvesting licensees increased noticeably during 1971. Five licensees planted a total of 825,400 trees on 1,733 acres. Included in the Crown totals shown above are 2,599,000 trees planted by the Forest Service on older cutovers in timber sale harvesting licences.

Also included in the Forest Service totals are some 1,030,000 container seedlings which were fall-planted. This was the first fully operational planting of

container stock in the Interior. An additional 26,000 container seedlings were outplanted in the continuing series of field trials, mainly in the Vancouver District. Interior trials were commenced in the fall and will be continued in spring 1972. Over two million container seedlings are being held in overwinter storage at various Interior points. Various companies also planted minor amounts of container stock in a series of co-operative trials.

In connection with the year's planting operations, district crews established 14,006 survival sample plots, and a further 6,552 plots in older plantations were re-examined. The northern districts reported a significant increase in browsing of planted trees by rabbits, and the Fish and Wildlife Branch confirmed that rabbit populations are now at, or are nearing, their cyclical peak, which occurs every seven to nine years. No effort was made to control either the rabbit populations or the damage caused. Survival reports continue to illustrate that good stock, well planted in the best available microsite, can survive normal summer drought

CO-OPERATION

Co-operative investigations with the Canadian Forestry Service in connection with the container nursery programme was intensified during 1971. This nursery system is still considered experimental, and continued basic research is necessary to determine and confirm optimum container size, mechanization of processes, fertilization schedules, and other facets as well as to deal with the inevitable problems which arise. Volume production will be reduced in 1972.

Co-operative research was also continued in the bareroot nurseries where studies were continued on damping-off, root-pruning, and the control of weeds and nursery pests. Of more immediate significance is a series of trials at Surrey to determine the susceptibility of young pine seedlings to the European pine shoot moth and the effect of nursery bed fumigation as a possible control measure.

At the request of the Canadian Forestry Service, this Division arranged, through two forest districts, for the collection of seed of alpine species by two foresters from Iceland.

Divisional participation in the Reforestation Board continued to provide regular contact with industry and other agencies on the progress of reforestation activities. Current projects concern outplanting of container seedlings and a review of these and other reforestation systems, and studies on browsing repellents.

The various forest nurseries again played a dominant role in the co-operative efforts of the Division. Apart from the routine participation in local fairs and other displays, Green Timbers contributed significantly to the Forest Service display at the Pacific National Exhibition. In connection with the Cowichan Valley Forest Museum, the Duncan Nursery staff have undertaken the establishment and maintenance of a 1-acre demonstration nursery and a plantation which will eventually cover 10 acres. The Seed Centre concluded its role in the germination studies being carried out on Abies species by the Western Forest Tree Seed Council. Results of this project are inconclusive. Nursery tours are perhaps the closest contact between the public and the Forest Service and, despite the time spent, the programme is considered worth while. At Red Rock, for instance, 484 people toured the nursery in more than 12 groups, and nursery facilities were often used for district, divisional, and co-operative functions.

The reforestation phase of the cedar-hemlock rehabilitation projects at Golden and Enderby was completed with the final seeding at Golden and the re-examination of survival plots at both locations.

Headquarters and Nelson District staff, in co-operation with the Canadian Forestry Association and local industry, presented a reforestation display at "Skogdag '71" held near Cranbrook this year.

In co-operation with the Division, several districts carried out a variety of silvicultural projects utilizing local unemployed persons and students. Vancouver District cleaned 465 acres of plantation, spaced 436 acres of natural second growth, and prepared another 240 acres for planting.

Kamloops District, under the supervision of the Regional Research Officer, established a spacing trial in 10-year-old lodgepole pine near Lac Le Jeune.

Prince Rupert District crews carried out spacing and sanitation cutting on some 670 acres and completed control of alder on another 200 acres.

In all districts, reforestation training of both Forest Service staff and industry was continued. This programme is important because of the regular turnover of technicians and the increasing number of licensees and contractors who are becoming active in reforestation. Those qualified are encouraged to write the respective Technical Forest Officer examinations. The need for substantially more qualified and experienced men in the field to cope with supervisory duties is foreseen.

Today's technology is growing and planting trees has become so complex that interdivisional co-operation must continue to be the keynote in not only the long-term programme but also in the day-to-day activities. This permits those doing the job the advantage of the experience, assistance, and advice of those in disciplines other than their own. In the Forest Service, this spirit of co-operation is exceptionally high.

INTERDEPARTMENTAL FORESTRY AND CORRECTIONS CAMP PROGRAMME

Under the guidance of trained and experienced correctional officers, this programme continues to grow in size and scope in spite of generally static camp populations.

One of the most significant advances during the year was the introduction of the Work Release Programme into forestry activities. This programme provides for pre-release inmates to work out on a daily basis without corrections supervision. They receive regular wages for the type of work they do. This year, 10 inmates from the Hutda Lake Camp were hired for a small planting project which was completed satisfactorily and with a high standard of planting. It is hoped this programme can be increased in the future, for the benefit of all concerned.

The rehabilitation of Stave Lake in co-operation with the British Columbia Hydro and Power Authority commenced in 1971 and promises to become one of the major projects under this programme. A 30-man camp was constructed near the work-site and was occupied in October. Actual recovery of salvable material from the lakeshore got under way early in November.

Operations on the clean-up of floating debris on Alouette Lake continued. This material covers about 100 acres, and is held behind a log boom at the north end of the lake.

In conjunction with the nursery expansion programme, inmate crews cleared and prepared some 70 acres at several nurseries, and assisted in the preparation of the reservoir-site at Chilliwack. In the production phase, crews lifted almost seven million trees and transplanted 704,000 seedlings. Other crews planted a total of 150,000 trees on 315 acres in various locations, and collected over 1,000 bushels of cones. Hutda Lake Camp provided men for the right-of-way clearing of 5½

miles of road into the northern seed orchard-site and prepared 80 acres for outplanting of genetic stock. An additional 320 acres of orchard-site were cleared of brush.

Maintenance and improvement of forest roads in all areas continued to occupy much of the crews' time. Routine work consisted of slashing brush, clearing ditches and culverts, repairing bridges, and gravelling. Two bridges, spanning 70 feet and 55 feet, were constructed in the Chilliwack Valley.

Fire-suppression crews were organized under Correctional Officers in each camp and were trained by local Ranger staff in the use and maintenance of pumps, chain saws, and other equipment. Due to the moderate fire season within the sphere of this programme, and the availability of other suppression crews, inmates took action on only 11 fires. Crews in the Prince George District, however, felled snags on 973 acres and manned secondary lookouts during short periods of high hazard. During standby periods these men constructed storage for equipment and hose-drying racks.

The rehabilitation of brushed-in areas and plantation release and cleaning is a continuing job in almost all areas. Over 150 acres were cleaned up, and thinning and pruning projects in second growth were started toward the year's end. Material salvaged from this work is used for camp fuel.

Sawmills operated by inmate crews convert suitable salvage material into lumber for camp buildings, bridges, and wharves. Other material produces shakes, posts, stakes, and other items for project use. Considerable time is also devoted to range-fencing, camp-site maintenance, search and rescue, fabrication of pallets and tent frames, and equipment repair. This work is rarely mentioned but nevertheless is an important part of this co-operative programme.

information division

IMMATURE WESTERN WHITE PINE

INFORMATION DIVISION

Mounting public concern over forest-land uses throughout 1971 resulted in a more concentrated effort by the Forest Service to "tell its side of the story." This, in turn, resulted in clearly defined efforts by the Information Division's over-all public relations programme. The endeavour included special advertisements in more than 100 weekly newspapers and in selected journals.

In addition to routine news releases and special articles for press and other publications, the Division also enjoyed expanded co-operation with various television outlets—particularly the CBC, CTV, and Cablevision broadcasting stations of Victoria and Vancouver. The Cable 10-TV. station of Vancouver presented a series of 13 half-hour programmes with the over-all title of "The Prime Resource"—all dealing with personnel and activities of the Service.

By year's end, arrangements were also being made for the Cablevision broadcasting station at Campbell River to include a similar series in its early-1972 schedule. Eight special documentary-interview type programmes were carried (mostly live) by the CTV outlet in Vancouver.

Several Forest Service publications were revised and updated; and a new brochure entitled *Sustained Yield from British Columbia's Forests* was widely distributed. The Division also produced the pamphlet *Campfire Do's and Don'ts.*

The sustained yield and "balanced use" themes were incorporated in various public displays and presentations.

PHOTOGRAPHY

Total production rose in 1971, and again with an increase in the use of colour.

Because of limited staff and space, some functions continue to be contracted out.

The section produced 17,162 prints (2,270 in colour), more than 900 colour slides, and 903 (35-mm.) colour transparencies. Duplication of slides was a major project, with more than 900 copied.

Two slide shows, "Sustained Yield in British Columbia" and "Bridging the Nass" were produced, both with synchronized sound commentaries. Ten copies of "Sustained Yield in British Columbia" were distributed throughout the Forest Service. "Bridging the Nass" will be distributed early in 1972.

Various projects were covered photographically in the Prince Rupert District. Other major assignments included continued photographic coverage of the Mica clearing project, recreational aspects, Boot Lake clean-up in the Sayward Provincial Forest, and detailed coverage of all aspects of the styroblock-container programme in the Surrey and Duncan Nurseries.

MOTION PICTURES

Production has been completed for the first in a series of reforestation films entitled "Trees Unlimited," to be released early in 1972. A total of 11,300 feet of 16-mm. colour film was shot on this and other projects.

Coverage was again given to the Mica pondage clearing; and film depicting lady planters at Hope, correctional camp inmates working in the Haney district, and suppression crews working on fires in Manning Park was produced for television use.

FOREST SERVICE LIBRARY

Shortage of space continues to be a critical problem, with the result library material is now scattered over four separate locations. Some 1,600 additions were made to the library throughout the year.

Early in the year, the librarian visited the Training School to explain the benefits of the library to members of an advanced course.

FILM LIBRARY

Throughout 1971 the Forest Service film library loaned 2,689 films, and they were seen by a combined adult and student audience of 341,320. This compares with 2,134 loans and 301,520 viewers the previous year.

A large increase was noted in organizations using our films from outside the Province.

Twenty-one films from outside sources were previewed, of which four were purchased. Twelve films were added to the library.

DISPLAYS

The forest-management cycle was featured in Forest Service displays at the Duncan Boat Show and the Skogdag programme at Cranbrook; while one at the Quesnel Trade Fair had a Centennial theme. There were also service displays at "Career Days" at Cranbrook, Vernon, and Kelowna. At the PNE, the research section was added to the permanent British Columbia Pavilion display to complete the indoor project. The pavilion was visited by approximately 600,000 persons.

A totally new display was established in the PNE's Festival of Logging area. Labelled "A Walk in the Forest," it contains some 200 upright, painted cedar timbers, features enlarged colour photographs depicting the principle commercial trees of the Province, and is attractively landscaped with living native trees. The display was visited by more than 33,500 people.

EDUCATION

Personnel of the Division were guest speakers at 30 meetings of various service clubs, business and school groups, and other organizations. Further assistance was also provided the outdoor classroom and general development at the Cowichan Valley Forest Museum near Duncan. There was also a steady flow of Forest Service information material to teachers, students, and librarians throughout the Province.

SIGNS

It was a busy year for the development and (or) introduction of various Forest Service signs.

Some highlights: Development of new Forest Road signs, some already in use; the redesigning of Ranger Station signs; plans for new recreation signs; production of public sustained-yield unit signs for use along Highway 16 in the Prince George Forest District; reforestation signs produced for plantations adjacent to major highways.

FOREST SERVICE MUSEUM

Numerous interesting items were donated to the museum; and considerable time was spent rearranging the growing collection of artifacts for easy access.

management division

ALPINE FIR

MANAGEMENT DIVISION

The pulp industry continued to operate below capacity due to a poor market, but the demand for lumber improved significantly after the first quarter. The improved lumber market made possible a continuing increase in the cut from the Interior of the Province where the scale increased 8.7 per cent over 1970. Production on the Coast continued to decline, falling 1.5 per cent below the scale for 1970. The total scale of all products in 1971, Coast and Interior, was 1,997,081,172 cubic feet, an increase of 3.2 per cent over the 1970 total scale.

During the year, close utilization became compulsory for operation in the sustained-yield units included in Pulp Harvesting Area 2 to supply raw material for the expanded pulp-mill under construction in Kamloops. The number of close utilization operations continued to increase throughout the Interior, although chip recovery was less than 100 per cent as a result of a continuing chip-car shortage. By the end of the year it was estimated 72 per cent of the total Provincial cut was at the close-utilization standard.

Established licensees in public sustained-yield units continued to opt to place their cutting rights into the new timber sale harvesting licence tenure. At year's end there were 203 timber sale harvesting licences which account for an annual cut of 6,346,050 cunits.

The Division was reorganized with the creation of a planning section to include tree-farm licence, recreation, and public sustained-yield unit planning responsibilities of forest management administration. This change was necessary due to increased emphasis being placed on forest planning, and there is an increasing need for frequent contact with representative groups from the public and the other resource departments, both Federal and Provincial.

MARKET PRICES AND STUMPAGE TRENDS

The stumpage rates payable for Crown timber in the Interior (tied directly to dressed lumber selling prices) increased significantly as a result of the improved market for lumber. However, stumpage rates on the Coast, which are tied to log prices, were depressed due to the poor pulp market. The average price bid for Crown timber was $3.87 per 100 cubic feet, compared with $4.28 in 1970. The average stumpage rates for the years 1965–69, inclusive, were $4.20, $4.25, $3.21, $6.26, and $9.02 respectively per 100 cubic feet.

The weighted average price per 100 cubic feet for timber authorized for cutting in the Interior increased from $3.02 in 1970 to $3.75 in 1971, and the comparable average price on the Coast fell from $8.15 to $4.52.

The average stumpage price detail shown in Table 62 includes the volume sold at salvage value only rates, plus the volumes included in close-utilization licences and cutting permits at a standard $0.55 per 100 cubic feet. The average stumpage price per 100 cubic feet for all species, excluding close utilization and salvage wood, was $5.04 on the Coast down from $8.87 in 1970 and $5.71 in the Interior, up from $3.98 in 1970.

STUMPAGE ADJUSTMENTS

Changes in lumber-selling prices resulted in 1,788 downward adjustments and 29,341 upward adjustments in the stumpage rates payable for timber cut on cutting permits and timber sales in the Interior. For timber cut on the Coast there were 4,442 upward adjustments and 2,451 downward adjustments.

As a result of these adjustments, stumpage rates at the end of the year were significantly higher than the yearly average.

SUSTAINED-YIELD PROGRAMME

Public Sustained-yield Units

As indicated by Table 50, the number of public sustained-yield units in the Province remains unchanged at 78, though there were minor adjustments in acreage and cuts as a result of new inventories in some units.

Approval was given to distribution of the uncommitted portion of the close-utilization annual allowable cut in a further eight public sustained-yield units, raising the number of units approved for close-utilization commitment to 44.

The close-utilization capacity of wood-conversion plants in the Interior continued to expand with the installation of additional close-utilization equipment in existing plants, replacement of some existing plants by new higher capacity close-utilization mills, and construction of new plywood or veneer plants and close-utilization sawmills to utilize the additional cuts made available by adoption of close utilization. With increasing demand and improved utilization, operations have also been permitted to develop into previously uncommitted areas, providing further wood for plant expansion and construction of new plants.

A number of licensees in Coast units have close-utilization harvesting licences, and consideration has been given to distribution of the uncommitted balance of the close-utilization cut in several coastal units. Full distribution has been delayed because few of the conversion plants, other than pulp-mills, are equipped for full close utilization. As a result, the cut commitment in public sustained-yield units has increased from 649 million cubic feet in 1966 to 921 million cubic feet in 1971.

Further progress was made in the preparation of plans for management of individual public sustained-yield units and, since these plans are intended to recognize and integrate use of all resources of the forest, other resource departments have co-operated in their preparation. Canada Land Inventory information is also used where it is available. There has also been improved co-operation between resource departments in reviewing development proposals for areas within public sustained-yield units, to ensure they provide adequate protection for other resource values, and field examinations have been arranged as required to determine how proposals fit conditions on the area.

Other interdepartmental field examinations were conducted to determine areas suitable for recreational use and to draw up plans for their development.

Again in 1971, 13 public sustained-yield units were designated as Provincial Forest Reserves, raising the total to 39. Since five of these units were previously designated as pulp-harvesting forests, the number of remaining pulp-harvesting forests has been reduced from eight to three.

Tree-farm Licences

In accordance with Order in Council 662, dated March 1, 1968, the Moresby and Bonanza Lake Blocks were included in Tree-farm Licence 2 as of January 1, 1972.

During the year, six working plans were submitted and reviewed. The trend toward integrated use has been continued and expanded with policies and procedures being developed for recreation, stream pollution control, wildlife and fishery protection.

The contracting guidelines developed by the Select Standing Committee on Forestry and Fisheries, which were adopted in April 1970, have now been in operation for a complete calendar year. Amendments to approved working plans, in line with the guidelines, have been reviewed and approved for all tree-farm licences, and the "contractor clause" administration appears to be functioning effectively.

FOREST RECREATION

One forester and one technician were added at each district office to work on integrating recreation into Forest Service administration.

Priority activity, now well under way, was to inventory and incorporate recreation data into the management plan of a selected pilot public sustained-yield unit in each district. Revised mapping procedures for this purpose are also being examined.

A review of all high-public-use recreation locations was initiated, as an aid to segregating areas of responsibility between the Parks Branch and the Forest Service, and in setting priorities for operational attention.

Joint Forest Service/tree farm licensee public recreation pilot projects were completed at two locations in the Nitinat Lake area.

At year-end, work was in progress on standard designs for Forest Service recreation facilities, and on tourist map brochures.

SILVICULTURE

The trend toward large clear-cuts has continued; however, a preliminary review has been made and work is proceeding toward the development of guidelines with respect to size of openings and sequential development.

Rehabilitation projects at the Blaeberry River and in the Noisy Creek drainage were completed and the final report, embodying benefit-cost analysis, is being prepared.

SCALING

Conversion to the firmwood cubic scale was completed by December 31, 1971.

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

Forest District	Number of Weigh Scales by December 31—				
	1967	1968	1969	1970	1971
Vancouver	5	5	4	6	6
Prince Rupert	8	10	16	20	20
Prince George	21	27	31	37	42
Kamloops	17	19	20	26	33
Nelson	4	20	20	22	29
Totals	55	81	91	111	130

Four per cent of Vancouver's 1971 production was weight-scaled, 55 per cent of Prince Rupert's, 87 per cent of Prince George's, 77 per cent of Kamloops', and 71 per cent of Nelson's.

LODGEPOLE PINE

grazing division

GRAZING DIVISION

GENERAL CONDITIONS

Temperatures were generally moderate during the winter of 1970/71. Hay supplies were adequate and stock came out of the winter in reasonable condition. With the exception of the Peace River District, snow-pack was above average in the range area and soil-moisture conditions were good at the commencement of the growing season. However, abnormally low spring temperatures retarded forage growth and turnout of stock had to be considerably delayed on many ranges.

Late spring and early summer rains, followed by high midsummer temperatures, resulted in above-average forage production for the year. The summer drought period was severe but short and only a few of the dryer range-sites were adversely affected. Winter weather with heavy snowfall occurred earlier than usual and curtailed late fall grazing. Stock came off range in generally good condition.

Hay production was higher than average, but quality variable. Persistent wet weather extending into July resulted in some spoilage of early crops or over-maturity due to delayed harvesting. The quality of some late crops, particularly in the Peace River area, was reduced by early fall rain. However, hay supplies in the range area appear adequate in spite of the early commencement of winter feeding.

Although predatory animals were particularly troublesome, total losses of stock to these animals were about average. Toxic plants appeared to take a lower-than-normal toll, due at least in part to eradication programmes and adjustments in stock management initiated by the Division. No serious live-stock disease problems requiring adjustments in range use occurred. Intensive industrial activity disrupted range-use patterns in several areas—a growing problem of serious concern to range-users.

A strong market prevailed for all classes of cattle, and prices remained reasonably firm at slightly higher levels than in 1970. The weighted average price received by cattlemen through the British Columbia Livestock Producers' Co-operative Association was $30.87 per hundredweight, compared to $30.17 in 1970, a rise of 70 cents.

RANGE AND PASTURE MANAGEMENT

The increasing level of associated land uses and the continuing diversion of range land to totally incompatible uses require that management of the Crown range be intensified simply to maintain the present level of use by domestic stock and avoid interuse conflict. Achievement of a satisfactory level of management is rendered difficult by high labour and material costs, and because there are many small under-capitalized ranch units involved. In many cases off-ranch employment is necessary, leaving little time for range-management effort by the operator. Nevertheless, during the year, a number of progressive adjustments were made in periods of use, stock-distribution patterns, and grazing intensities. Rotational grazing was introduced to several additional range units. A start was made toward regulating use of Crown lands by horses in the northern areas of the Province.

Efforts toward satisfactory integration of range-land uses were intensified. Division officers participated in field inspections and management planning sessions with other resource-management agencies and user groups. Local committees representing resource-management agencies are helping to co-ordinate such activities.

In many situations, existing knowledge of intereffects is inadequate to ensure most effective use integration. To help correct this situation, several intensive studies

were commenced. A study of the inter-relationship between mule deer and cattle on a deer winter range on the north side of Kamloops Lake—a co-operative study with the Canada Range Research Station at Kamloops and the Fish and Wildlife Branch. The Division is also working with the Fish and Wildlife Branch and Department of Agriculture in a cattle-wildlife relationship study in the East Kootenay area by the University of British Columbia. This three-year study is in the planning and equipment-testing stage and will involve the first use of biotelemetric techniques in this type of work in the Province.

Clear-cut lodgepole pine areas present an opportunity for increased forage production through seeding of domestic grasses and legumes. To determine the compatibility of such seeding and subsequent grazing with coniferous regeneration, 1,100 acres of clear cuts were seeded and will be studied over the next three years in co-operation with the Research and Management Divisions and the Range Research Station.

The teaching and promotion of improved range-management techniques to range-user groups through illustrated slide talks, field meetings, and other means was continued.

Range Surveys

During 1971, field work was undertaken on the following areas: Lemon Lake Unit, Horsefly Stock Range; Naramata Unit, White Lake Stock Range; Roche Lake-Dardanelles area, Nicola and Monte Hills Stock Range; Gustafsen Lake Unit, Clinton Stock Range; South Ashnola area, Keremeos Stock Range. Maps and reports on these areas are being prepared.

Maps and reports were completed for the following: Deadman Creek Stock Range; Allenby and Nine Mile Units, Princeton Stock Range; Scarped and High Mountain Units, Lillooet Stock Range; Choelquoit Unit, Chilcotin Stock Range.

Maps and reports are nearing completion at the end of the year for: Dog Creek Unit, Clinton Stock Range; Cahoose and Clesspocket Units, Anahim Stock Range.

Range and Pasture Improvements

Emphasis in the range-improvement programme was placed on the construction of improvements designed to facilitate control and distribution of stock on the range. Intensive pasture-development work was limited to completion of projects already under way and the rebreaking and reseeding of portions of several pastures established several years ago. Assistance to the programme from the Range Improvement Fund amounted to $189,492, and $20,000 was spent on pasture projects in the Peace River area. Range-users contributed substantially to most projects.

Structural improvements constructed or replaced included 110 miles of trail and road, 108 miles of fencing, 48 water developments, 16 bridges and culverts, 41 cattle-guards, 11 corrals, two breeding pastures, two horse pastures, one holding ground, and seven enclosures for experimental studies or demonstration purposes. Routine maintenance was carried out on nine buildings, 88 miles of fencing, 54 miles of trail and road, and 10 water developments within the Peace River pastures.

Brush-control measures were undertaken on 4,286 acres, of which 256 acres were treated by mechanical methods and 4,030 acres by prescribed burns, mainly in the Peace River area. Within pasture projects, 1,545 acres were cultivated for seeding.

A total of 70,335 pounds of grass and legume seed was sown on ground denuded as a result of wildfire, logging, or other industrial activity and on cultivated sites. Seed was applied from the air to 10,500 acres of burned-over or clear-cut

forest land. Aircraft designed for this type of work were used for the first time and were effective.

Knapweed is a serious problem on many ranges. Chemical control on a large scale is not economically or physically feasible and biological control appears to be the only practical solution. A total of 92 acres of knapweed was treated chemically.

Miscellaneous improvements included removal of abandoned buildings, garbage, and other hazards and control of toxic plants. Beaver and predator-control measures were also undertaken in co-operation with the Fish and Wildlife Branch in several areas where these animals were particularly troublesome.

CO-OPERATION

Close contact with the industry was maintained through the 63 local Range Livestock Associations currently recognized under the *Grazing Act*. Association activity remained at a high level and 197 association meetings were attended by Forest Officers. A number of association area boundaries were revised to adjust to changing range use patterns.

The B.C. Beef Cattle Growers' Association helped in dealing with a number of matters of industry-wide importance. The association has changed its name to "British Columbia Cattlemen." The British Columbia Livestock Producers' Co-operative Association, the industry's marketing agency, again supplied the selling-price figures necessary for calculating grazing fees under the sliding scale. The co-operative sold approximately 46.8 million pounds of beef animals from the range area during the year.

ADMINISTRATION

Grazing use of Crown range increased slightly in 1971, reversing the trend of the past two years. This, together with the need for improved integration of land uses, increased the administrative work load. Special problems such as the displacement of ranches by the Libby Reservoir and arranging for various research projects demanded considerable staff time. The need for revised legislation to meet changing demands on the range and conditions in the industry was explored.

Grazing and Hay Permits

During the year, 1,920 grazing permits were issued authorizing the depasturing of 178,772 cattle, 6,186 horses, and 1,484 sheep on Crown range. The number of permits issued is down slightly from the previous year. The number of cattle is virtually the same, horses up slightly, and sheep continued to decline. (*See* table 70 in the Appendix.)

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 829,337 animal-unit months, 6,895 more than the previous year.

A total of 195 hay-cutting permits was issued authorizing the harvesting of 1,968 tons of meadow hay, approximately the same as 1970.

Grazing Fees

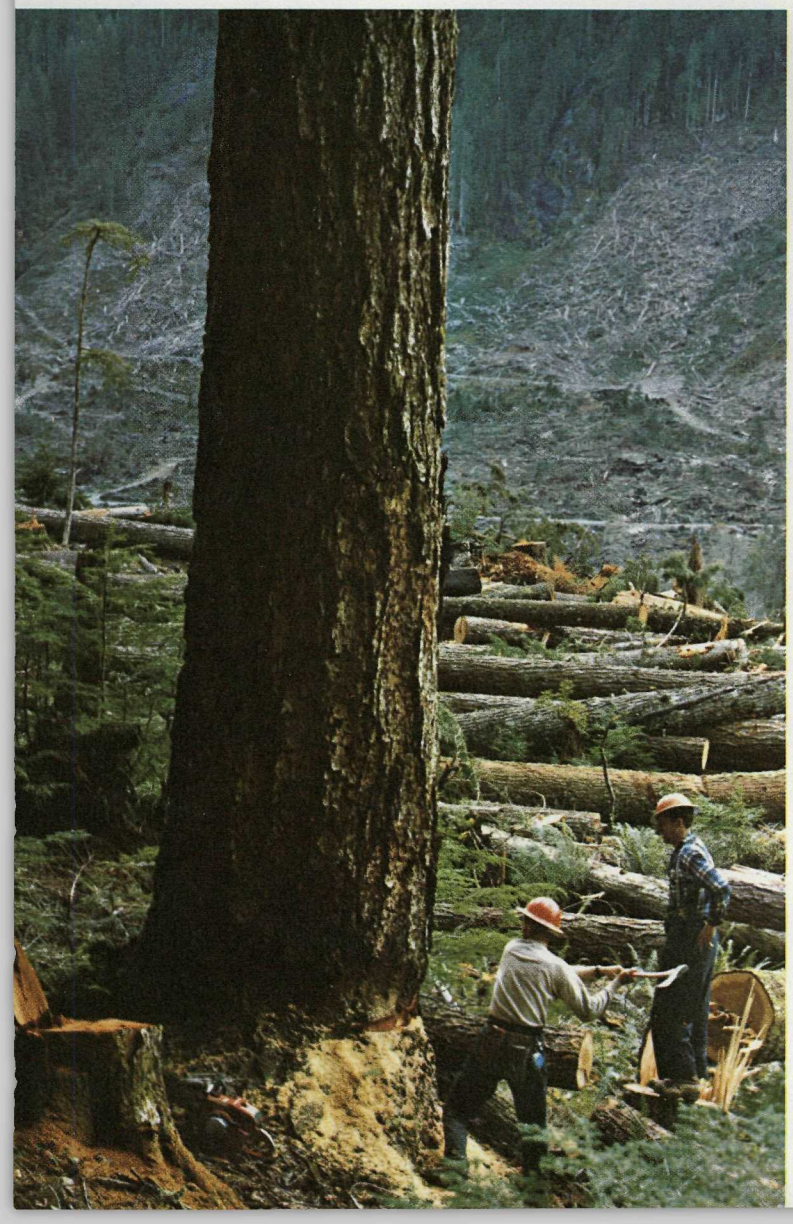
Grazing fees are on a sliding scale related to prices received by the producers the previous year. Except for cultivated pastures in the Peace River area, grazing fees per head per month were 60 cents for cattle, 75 cents for horses, and 15 cents for sheep, a considerable increase over the previous year. The separate scale of

fees for cultivated pastures in the Peace River area remained at the rate of $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

Routine measures to control use of Crown range during the year included an increased number of pre-turnout stock counts and range inspections. Although most stock-owners complied with the regulations and permit conditions, it was necessary to seize and detain trespassing stock in 20 cases. In addition, two cases were successfully prosecuted in Court. Trespass by horses, particularly in the Cariboo and Chilcotin areas, continues to be the main problem.

DOUGLAS FIR



engineering division

ENGINEERING DIVISION

HIGHLIGHTS

- The decision to replant the Van Fire area, in the Prince Rupert Forest District, led to survey and design for a road into the area from Nilkitkwa Lake, and by year's end Forest Service crews were mobilizing for construction of the first section, which will include a permanent bridge across the Babine River.
- The large volume of debris and wood of marginal economic usability present in reservoir lakes, in rivers, in the sea, and on beaches, has received increasing attention in recent years. Economic studies and proposals for recovery, sorting, utilization, and disposal are continuing, and pilot projects are being carried out. The Forest Service, other Government agencies, and industry are working on these problems.
- The Provincial Student Assistance programme made it possible to accomplish a number of tasks which might otherwise have been postponed or left undone.
- A member of the Engineering Division was assigned full time to the Joint Coast Appraisals Committee to review coastal stumpage appraisal methods.
- The Peace Pondage Waterways Improvement Project won the British Columbia Safety Council Award of Honour for safety in the treatment of 34,000 acres. This work is hazardous and project operations were spread over 150 miles.

ENGINEERING SURVEYS

Field survey crews completed 192 miles of road location, and surveys of bridge-sites, nurseries, Ranger Stations, lookout-sites, and railroad and highway crossings.

District field engineering included development studies of the Fort Nelson and Fontas PSYU's, access-route studies in 31 public sustained-yield units, and 600 miles of road evaluations in tree-farm licences, timber sale harvesting licences, and public sustained-yield units.

DESIGN

Designs, drawings, and specifications were prepared for two pressure-creosoted timber bridges—one on the Chilako River in the Prince George District and one on the Babine River in the Prince Rupert District. Design of the latter, which will provide access for reforestation, required considerable consultation with Federal and Provincial agencies to ensure no damage to the fishery resources.

Other design work included nine preliminary sketches and estimates for bridges, three log bridge designs, and numerous smaller jobs.

MANAGEMENT ENGINEERING

A study entitled "Log and Debris Salvage in the Strait of Georgia" was completed and submitted to the Select Standing Committee on Fisheries and Forestry of the British Columbia Legislature. Investigations are proceeding on control and disposal of Fraser River debris, loss of logs from log booms, and the amount and utilization of debris and logs on beaches.

The 70-mm. fixed-airbase photography programme ended abruptly when the boom and cameras were jettisoned into the Fraser River during an emergency. Replacement is in progress.

The road recording equipment was improved and 570 miles of road were "surveyed" in a few days' time. Later, plans and profiles were produced by the Government computer in minutes.

A benefit-cost analysis for reforestation of the Van Fire area in Prince Rupert District was made, and the effect on the forest economy of flood-control dams in the headwaters of the Fraser River is under study.

CONSTRUCTION

A major bridge of wood and steel construction was built across the Nass River near Meziadin Lake to provide access for administration and protection of the forests to the north.

The larger road projects included construction of 16.7 miles of the Bull River Forest Road, a start on upgrading 21 miles of the Hartley–Sulphur–Quinn Creek Forest Road, and continued construction on the Kootenay Lake East Forest Road. General maintenance of the forest road system was carried out by crews under district supervision.

RESERVOIR IMPROVEMENTS

Clearing work on Williston Lake included the treatment of a further 10,600 acres and the burning of debris trapped in areas of drawdown in the Lower Parsnip region. A feasibility study for chipping of floating timber on Williston Lake was completed, and a pilot operation for sorting of sawlogs from floating debris was carried out.

The waterway-improvement programme on the Mica Reservoir continued with the treatment of 13,300 acres. Site-preparation work on the Canadian portion of the Libby Reservoir continued with an additional 1,290 acres placed under treatment and a further 2,410 acres completed to final specification.

BUILDING AND MARINE SERVICES

Replacement launches were provided for Babine Lake and several coastal Ranger Districts. A new twin-screw steel tug, with split hull for transportability, was ordered for debris-sorting work on the Peace and Mica pondages, together with two additional steel boomboats.

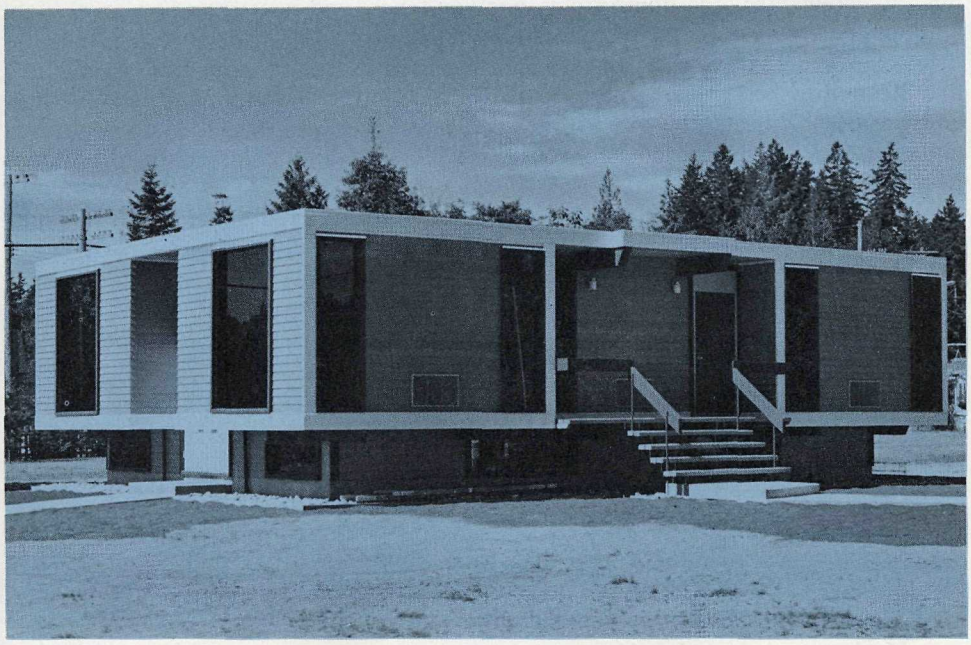
The construction of a new Ranger Office building at Parksville and a Forest Research Laboratory at Saanich were the major building projects of a busy year. Forest Service crews built a replacement Ranger Station at Vanderhoof and started on a new warehouse complex at Nelson. Documents were prepared and contracts awarded for various major and minor projects.

Some 40 trailers were purchased, including eight mobile homes and eight seedling refrigerator trailers.

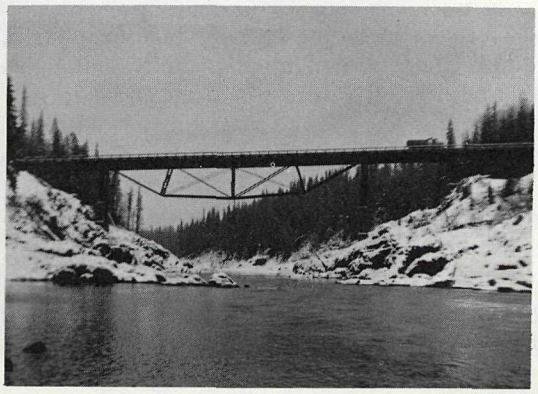
Material for five bridges was inspected. Special steel, welding procedures, and connections in a major structure crossing the Nass River required detailed inspection work. Glulam was inspected for the Nelson warehouse, the Vancouver warehouse extension, the Campbell River refrigerator building, the Prince George Ranger Station, and numerous smaller projects. Eight 10,000-gallon tanks for a new tanker base at Kamloops and five drag-chain scarifiers were procured. Breaks occurring in an 8-inch welded main pipe-line serving the Surrey Nursery were investigated.

MECHANICAL

The vehicle inventory of sedans, crew-carriers, panels, pick-ups, crew buses, dump trucks, and tractor-trailer units increased by 67. Twenty-five vehicles were purchased for the new Cariboo Forest District—five sedans, five carryalls, 10 pick-



New office building at Forest Ranger Station, Parksville.



Bridge over Nass River, completed in 1971, combines creosoted glulam girders and steel-truss members in a unique trussed-girder design. It's the largest bridge built by the Forest Service.

A powerful tractor downs logging residual on the Upper Canoe in the Mica Reservoir area.

ups, two crew-cabs, one dump truck, one van truck, and one tractor-trailer. Eight additional crew buses were purchased for the Reforestation Division.

Some older heavy-duty trucks were replaced by four tractor-trailer units and five 20-ton low-bed trailers, one of each for the Nelson, Kamloops, Prince George, and Cariboo Districts, the extra trailer going to Prince Rupert District. One used tanker-truck was purchased and converted for fire suppression in the Kamloops District.

Five graders and four tractors were replaced, and an additional loader obtained for the Cariboo District.

A heavy fire season necessitated the purchase of many fire pumps, chain saws, and allied equipment.

The need for snow toboggans is increasing; 19 were purchased to bring the total to 83.

Only one all-terrain vehicle was purchased—for the Prince George District. Interest has waned, in view of some past experience, but the search continues for a suitable type.

FOREST SERVICE MAINTENANCE DEPOT

Maintenance included a new river-front bulkhead, a float and ramp, a ways carriage, and roofing. Underground air-lines, increases in parking and storage area, dredging, and other improvements increased efficiency.

Marine work included 32 launch and four jet-boat overhauls, 88 launch and small-boat repairs, and new electronic, navigation, auxiliary, heating, and main propulsion installations. A number of new boats, including several "Deep V" runabouts, were fitted out for service.

The depot made or assembled 887 units, including lookout buildings, signs, furniture, crates, radio-repeater buildings, fire-retardant mixers, utility and light-plant trailers. In addition, 18 portable tanker units were produced and 526 new pumps, outboards, chainsaws, and similar units were tested and shipped or stored. Couplings were installed on 384,000 feet of discharge fire hose and 366 pump suction hoses.

Maintenance and overhaul were carried out on 846 small units, including pumps, outboards, chainsaws, light plants, and trail-cycles, and on 254 larger units, including light and transport trucks, tractors, graders, trailers, and porta buildings.

The transport pool hauled 4,260 tons and towed 90 trailers, travelling 240,000 miles. The warehouse handled 1,170 shipments to and from various projects.

COMMUNICATIONS

Equipment purchased in 1971 totalled 601 units, of which 178 replaced obsolete equipment for a net inventory increase of 423. Emphasis continued on the portable and mobile fire-equipment programme.

Most repeaters in the Province were changed to newly assigned frequencies chosen for their compatibility in multifrequency use. The changes permitted the Prince George system to be divided into three zones capable of interconnection at headquarters, giving increased flexibility at the Ranger District level.

At a few sites the new frequencies did create on-site interference problems, but all were resolved by the installation of frequency-selective filters.

Twenty-seven base stations and repeaters were completely overhauled and three Ranger District repeaters were installed.

protection division

WESTERN HEMLOCK

PROTECTION DIVISION

WEATHER

A cool spring, with wet weather continuing until mid-July, was general through most of the Province.

Parts of the north half of the Province experienced a cool but dry spring, during which time a fire hazard developed. Except for the extreme north and the Peace River areas, which continued relatively dry, the remainder of the north had near normal June rains.

In early July the weather changed abruptly to hot and dry, causing high to extreme hazard conditions over most of the Province. This situation continued until late August. Cooler wet weather developed in early September and remained until the fire season ended on October 21.

Lightning activity was heavier than usual through most of the Province.

FIRES

Occurrence and Cause

There were 2,898 fires during the 1971 season, compared with the 10-year average of 2,374 fires, and considerably lower than the record of 4,003 fires during 1970. Fire problems were intensified with nearly half of them occurring during August.

The largest single cause of forest fires was lightning, which accounted for 1,327 fires—46 per cent of the total. The 10-year average percentage for lightning fires is 37 per cent.

An estimated 18 per cent of the 1971 fires were started by recreationists and smokers, compared with the 10-year average of nearly 30 per cent; and approximately the same as in 1970.

Cost of Fire-fighting

Forest Service costs for fire-fighting totalled $10,294,391, and the cost to other parties was $1,291,811. The average cost per fire was $3,552—more than double the 10-year average of $1,456. There were several large and difficult fires to fight and they were the major cause of the increased average cost.

Damage

The acreage burned during 1971 soared to 868,864 acres, compared to the 10-year average of 227,608 acres. The damage value increased also, but is in line with the area of burn when compared to the 10-year average.

FIRE-SUPPRESSION CREWS

In the three southern forest districts, 13 suppression crews of 5 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 George and Prince Rupert Districts. Suppression crews fought 579 fires, and during low-hazard periods they worked on other forestry projects.

PROVINCIAL STUDENT EMPLOYMENT PROGRAMME

This programme, instituted for the first time, was a complete success. A total of 560 students was employed throughout the forest districts and by the Victoria divisions during the summer. Their performance was good and numerous outstanding projects were completed which could not otherwise have been undertaken.

The student crews proved particularly valuable for initial attack action on forest fires. In addition, they were employed on such diversified activities as tree-planting, timber-cruising, regeneration surveys, juvenile youth growth-spacing projects, developing back-country recreational camp-sites, etc.

Female students provided valuable assistance in clerical work at ranger and district headquarters.

AIRCRAFT

Aircraft of all types were used extensively during the fire season. The service rendered in detection, initial attack, and supply contributed significantly to the efficient suppression of many fires.

Six light aircraft were operated under contract for fire detection in the Prince Rupert, Prince George, and Kamloops Forest Districts, and were supplemented with locally hired aircraft as required for short-term use.

Three contract aircraft were provided for general flying to the three southern districts. In the two northern districts local aircraft were hired as required.

Helicopters were extensively used on fire-control work—the three-place piston engine and light turbine types continued to fill the majority of needs. One helicopter was provided under contract to the Vancouver District for the fire season, while in the remainder of the Province there were sufficient machines to allow local hire.

Three Cansos, eight Avengers, and three A-26 air-tankers were provided under contract, plus six bird-dog aircraft. The tankers were used mainly on initial attack and took action on 18 per cent of all fires. Five additional air-tankers were supplied by contractors during emergencies.

MUTUAL AID, DEPARTMENT OF NATIONAL DEFENCE

In mid-August, the fire situation necessitated the use of four-wheel-drive transportation. To alleviate the problem, the Department of National Defence provided 12 units, eight of them four-wheel-drives, and four six-wheel-drives, plus 24 drivers and two noncommissioned officers for a two-week period.

ROADS AND TRAILS

The road and trail construction programme progressed with emphasis on the rehabilitation and maintenance of access roads to reforestation projects and the protection of immature forests.

SLASH DISPOSAL

Successful slash-burning was carried out throughout the Province by industrial operators and the Forest Service.

In the Vancouver District, two prescribed burns, totalling 398 acres, were completed by the Forest Service. No spring burning took place. In August, burning commenced in the northern sections of the district and along the west coast of Vancouver Island. Those areas along the south end and east coast of Vancouver Island and the easterly section of the Fraser Valley experienced drought conditions up to the commencement of the fall rains, which resulted in reduced burning being carried

out in these areas. Slash reports covered 67,646 acres of logged-over lands, of which 22,661 acres were exempted from burning. A total of 44,514 acres was burned successfully by industrial operations.

In the Kamloops District, two large companies made a concerted effort to reduce the backlog of unburned logging slash with excellent results. A total of 19,714 acres of logging slash was instructed for burning, of which a total of 18,890 acres was burned successfully. The Forest Service burned 756 acres of logging slash.

The Prince Rupert District completed excellent burns, and the total acreage of logging slash abated was much higher than expected due to weather conditions throughout the district. No spring burning was undertaken. The Forest Service burned 1,549 acres, while industrial operations accounted for 20,532 acres. Slash reports covered 41,783 acres of completed logging, of which 30,770 acres were instructed to burn and 11,013 acres were exempted.

The Prince George District carried out a limited amount of spring burning. Severe drying in August prevented late summer burning and only a short period of favourable weather occurred during September. As a result, satisfactory slash disposal was carried out on 13,200 acres by industrial operations and 1,430 acres by the Forest Service.

In the Nelson District a total of 25,230 acres was instructed to be burned, of which 17,812 acres were burned satisfactorily by industrial operations. The Forest Service burned 822 acres.

SNAG DISPOSAL

In the Vancouver District, snags on 2,999 acres were felled—863 acres under contract and 2,136 by Forest Service crews.

In the Prince George District, snags on 857 acres were felled by inmates of the minimum security camp of the Attorney-General's Department.

FIRE-LAW ENFORCEMENT

Charges were laid for 58 violations of the *Forest Act*. Thirty-one involved burning without a permit, 16 for refusing to render assistance in fire-fighting, seven for contravening forest-use restriction orders, and the remainder for other offences.

FOREST-USE RESTRICTIONS

Several industrial forest-use restrictions were imposed during the season and only lasted a short time during extreme high hazardous periods. Details of the restrictions follow:

Forest-use Closures, 1971

Area	Forest District	Type of Closure	Date Implemented	Date Terminated
Entire district	Vancouver	Restricted industrial	July 27	Aug. 4
Zones 1, 5, 6, 8	Prince Rupert	Restricted industrial	July 27	Aug. 2
Zones 2, 3, 4, 7	Prince Rupert	Restricted industrial	July 27	Aug. 2
Entire district	Vancouver	Restricted industrial	Aug. 10	Aug. 16[1] Aug. 20[2]

[1] Zones 2–8. [2] Zones 1, 9, 10.

Suspension of Campfire Permits

Area	Forest District	Date Implemented	Date Terminated
Entire district	Vancouver	July 27	Aug. 4
Entire district	Prince Rupert	July 27	Aug. 2
Entire district	Nelson	Aug. 6	Aug. 31
Entire district	Vancouver	Aug. 10	Aug. 16[1]
			Aug. 20[2]
West of Rocky Mountains	Prince George	Aug. 12	Aug. 16
Entire district	Kamloops	Aug. 12	Aug. 17

[1] Zones 2–8. [2] Zones 1, 9, 10.

PROTECTION PLANNING AND RESEARCH

Fire Statistics

Fire data for 1970 were coded, edit checked, and placed on magnetic tape. Data are now available for studies from 1950–70, inclusive. The creation of the new Cariboo Forest District made necessary the re-sort of all data into the now six forest districts, and this work is in progress. Six computer programmes were run to satisfy a variety of requests, but the main emphasis was on the Provincial detection analysis.

Work continued on the Provincial Fire Atlas to update the base maps and overlays to the 2-mile scale for the 1940–59 decades.

Visibility Mapping and Lookout Photography

No field work was undertaken in either of these functions, and until the Provincial detection analysis has been completed these activities will be limited.

Fuel-moisture Indicator Sticks

Fuel-moisture sticks were preassembled in Victoria, then transported to the Western Forest Products Laboratory in Vancouver for final trimming. Of the 1,210 sets distributed, 56.4 per cent went to industry, 42.6 per cent to the Forest Service, and 1 per cent to the Canada Forestry Service.

Production of 1,500 sticks for 1972 started before the end of the year.

Insect, Disease, and Pesticide Administration

Liaison with other Provincial Government departments, Federal agencies, and joint Government/industry committees was actively maintained on forest insect problems.

Pesticide applicator courses were arranged through the Department of Agriculture of all forest district and division personnel involved in pesticide use. Forest Service membership on the Government Pesticide Committee continued, and all plans for chemical treatment by both the service and the forest industry were reviewed. In addition, all plans by other users which could affect the forest environment now automatically come under Forest Service attention.

Research Projects

Major project completions during 1971:

Handbooks—One handbook in the Forest Protection Handbook series was completed and distributed, *Handbook for Lookoutmen, No. 6.*

Pulp chips—Investigations proved that pulp-chip accumulations along certain sections of railways are increasing rapidly, constitute a hazard, and sig-

nificantly increase the problem of fire extinguishment. Car covers appear the only solution.

Fire-fighting foam—Various foam and foam generators were investigated. They do not have practical forest application at this time.

Propane-fire camp stoves—A standard Forest Service model was developed and a supply distributed to all forest districts. The unit is single burner, 24 inches by 24 inches by 13 inches, 20,000 B.t.u., weighs 40 pounds, and costs $47 to construct, using penitentiary labour.

Pre-cooked frozen fire meals—A satisfactory product was tested from a United States source. However, the 17½-per-cent duty charges and the recent Government ruling against food purchase outside the Province leaves no alternative but to wait for Canadian company interest.

Fire tool-box for utility trailers—A compartmented plywood box that fits the standard utility trailer for basic initial attack items was developed on suggestions by field staff.

Danger-index calculator—Eighty calculators were developed and distributed to field staff at those stations not receiving indices on the computer programme. The original working model was submitted by the Prince George office.

Major projects active but not finalized during 1971:

Detection—The Vancouver Forest District portion of the Provincial detection analysis is reaching final stages and accounted for the bulk of staff time during the year. Liaison with the Forest Fire Research Institute in Ottawa continued on this project.

Wheeled skidder attachments—In co-operation with the Kamloops District and the Maintenance Depot, skidder attachments were developed, prototype tested, and final design established. The unit will consist of a universal frame adaptable to all types of skidders with tanker unit and equipment carrier attachments. Units will be supplied to all districts in 1972.

Mobile kitchen—A prototype mobile fire camp kitchen was designed and one unit was built by a commercial producer. The prototype is designed to feed 125 men, is propane-fired, has its own water-pressure system, light plant, refrigerator, and air-conditioner. Final modifications are completed and units will be supplied to all districts in 1972.

Air-ground audio system—A prototype was developed and tested. It has loud hailer, hooter, and siren capabilities with 100-watt output. Units will be supplied for all bird-dog aircraft in 1972.

Wet water agents—Comprehensive tests were carried out on 10 wetting agents to determine the best products for Forest Service use.

Infra-red detection—Two airborne units of different make were tested on fires during the summer. Results were inconclusive and further testing will be carried out in 1972.

Ranger pre-organization charts—Pre-organization books were reanalysed with all districts and a new, standardized format determined. These will be made available in 1972.

Analysis of the campfire permit system—A modified permit system was introduced in 1971. Analysis of the results is under way to determine whether or not a permit system is still valid and, if not, what approach should be taken.

Handbook—The preparation of a handbook plus pocket field book on *Water and Pump Use* is under way.

Fire-data tables—The preparation of the fire-data tables for district use from 1950 to date has been delayed by the creation of the Cariboo District. The re-sort of data is under way.

Retardants—Comparative operational tests between Gelgard and Tenogum were delayed because of the phenol content in the latter product. When this was eventually cleared, the air-tankers had been diverted to Alberta. Testing will be programmed for 1972.

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.

Ten *Planning and Research Reports,* covering a variety of protection projects, were published and distributed to field staff and outside protection agencies. Considerable numbers of the "handbook" series were requested by libraries and agencies in Canada and many foreign countries.

Co-operation continued with the Canada Forestry Service and the Atmospheric Environmental Service on the Provincial fire weather network and the danger rating system. Two student weather technicians were rehired for the summer months to assist the field staff in instrument calibration and problems with the index system. A meeting was held with, and a brief submitted to, the cross-Canada Meteorological Task Force reviewing forest meteorological requirements.

Liaison with other agencies included representation on various subcommittees of the National Research Council.

A duplicate tape of the fire data was supplied to the University of British Columbia and computer-oriented studies should be forthcoming from this source in the future.

Meetings were held in all forest districts to determine up-to-date priority needs in protection to direct the research efforts.

training school

SITKA SPRUCE

TRAINING SCHOOL

Twenty-four men enrolled in the second term of the 16th advanced course (69 days) and they graduated on April 8, 1971. Subjects included scaling, measurements, fire suppression, forest management, navigation, sales and appraisals, public speaking, public information, engineering, fish and game, personnel, and safety.

The school's 11th basic course (69 days), with 24 students, commenced on September 9 and ended December 17. Studies included mathematics, surveying, fire-fighting, photogrammetry, forest management, reforestation, silviculture, mapping, and the maintenance and operation of mechanical equipment.

Since 1946, 243 men have graduated from the school's basic course; and 343 from the advanced training classes.

EXTRA COURSES AND FUNCTIONS

The school provided facilities and some instruction for a course held May 4 to 16 for 78 Inventory Division fieldmen; and introductory courses for new graduates from technical and professional institutions were held for the first time. A professional group of 21 men took the course between May 17 and 21, and a technical class of 29 attended from May 31 to June 4.

Training programmes and defensive-driving courses were conducted for personnel of various forest districts and divisions; and 1,700 elementary school students attended two weeks of outdoor classroom lectures presented by the Canadian Forestry Association.

The *Forest Act* reading course was updated and distributed to districts and divisions.

At the peak of the fire season, two instructors assisted the field staff—one at Kamloops, the other at Nelson.

CONSTRUCTION

An air-conditioning unit was installed in the administration building, and a sidewalk will soon link the school's parking-lot and dormitory building.

accounting division

WESTERN RED CEDAR

ACCOUNTING DIVISION

FISCAL

The conditions affecting Forest Service financial return improved significantly during 1971—not apparent in the comparative revenue tables in the Appendix to this Report but reflected in the comparative totals of amounts charged against operators (*see* Table 142).

The trend to recovery from the drastic decline experienced in 1970 did not develop until the latter half of the year, when the benefit of higher market prices began to be felt. Total collections did not match those of 1970, but monthly totals from August to December recorded steadily increasing gains.

In spite of the added problems faced by the industry stemming from the world currency crisis, the total scale of all forest products increased by 3.3 per cent. Prospects for 1972 appeared hopeful, but economic conditions were still unsettled and numerous labour contracts were due to expire during the year.

The total of amounts charged against logging operations was $67,669,895 (*see* Table 142), an increase of 8.6 per cent over 1970. Only the Vancouver Forest District recorded a reduction, 5.3 per cent. Kamloops District led the increases with a substantial 42.2 per cent, followed by Prince George with 20.7 per cent, Nelson with 15.8 per cent, and Prince Rupert with 2.7 per cent.

Direct forest revenue collected in 1971 was less than that of 1970, dropping by 6.2 per cent to $60,890,218 (*see* Table 141). The major category (timber sale stumpage) declined 7.1 per cent to $49,680,565. The associated timber sale rentals and fees were also down by 11 per cent, but timber sale cruising and advertising showed a minor increase.

Timber royalties, the second major revenue source, continued downward, losing 10.6 per cent for a total of $5,553,861.

Timber licence rentals and fees and timber berth rentals and fees both decreased, by 4.1 per cent and 8.2 per cent respectively, as the elimination of logged areas from these old tenures progressed. Timber lease rentals and fees were practically unchanged, recording an increase of less than 1 per cent.

Grazing permits and fees again increased, this time by 7.2 per cent to $469,636. These fees are subject to adjustment annually on a formula related to market prices being received for stock. Forest-protection tax at $1,123,517 was up 11.6 per cent, probably due to a change of billing method in May on timber sale harvesting licences to an annual allowable cut basis. Tax on these tenures had formerly been collected by an acreage charge.

Miscellaneous collections continued to increase the total of $735,683—9.9 per cent higher than 1970 collections. Recovery of fire-fighting costs incurred during yet another record fire season was a factor. Weight-scaling costs rose sharply by 31.7 per cent to $1,514,347 as additional facilities were installed. These costs are fully recoverable from the industry.

Financial tables covering operations for the fiscal year 1970/71 are in the Appendix (Tables 143 to 145). Detailed expenditure information is published yearly by the Department of Finance in the Public Accounts.

ADMINISTRATION

In spite of the market problems for the industry, collections were maintained at a good level during the year. Resort to the application of liens to ensure payment was not unusually frequent and few individual cases were of long duration.

A major problem for both district and headquarters offices was the accounting for a record fire season. It appeared the final total would approximate $11,000,000. The special Government summer programme for the employment of young people ($1,129,992) also contributed to increased volume.

In headquarters there was continued growth in the expenditure section due to preparations to cover all employees for unemployment insurance effective January 1, 1972, the increase in reforestation payrolls resulting from the accelerated planting programme as well as the effect of the record fire season.

Stumpage adjustments dealt with by the timber sale section increased to 20,775 in 1971 compared to only 12,035 in 1970, reflecting the frequency of price increases of the various species during the latter part of the year. In 1969, the record year, there were 21,636 adjustments.

The total of accounts receivable reached a record high of $15,264,606 in December. Conversely, the total number of billings of annual fees on timber licences and leases and pulp licences and leases was down from 2,960 in 1970 to 2,686 in 1971 as these tenures continued to be eliminated as fully logged.

Marine hazards were reduced by collection of 7,058,221 cubic feet of drift logs under the Log Salvage Regulation, an increase of over 1,600,000 cubic feet over 1970.

A slightly better market for salvage logs, an increase in returns to permittees, and the efficient operation of the sorting ground operated by Gulf Log Salvage (licensee of the Log Receiving Station) account for the increase.

Only one new beach-clearing licence was issued. Located in the Log Salvage District, its purpose is to determine the minimum size and quality of beach logs which can be utilized economically as well as the effect of a continuous operation. By the end of 1971, 64,637 cubic feet were removed from this sale. Production of 283,163 cubic feet from five sales on Queen Charlotte Island beaches meant the total production from beach-clearing sales was down 474,363 cubic feet from the 1970 figure. Former beach-clearing operations, however, reverted to beachcombing and produced 300,332 cubic feet in the Queen Charlotte Islands and 822,909 cubic feet in the Vancouver Forest District, mainly on the West Coast of Vancouver Island.

The Division maintains close co-operation with the forest industry's Log Security Committee in its continued efforts to reduce and prevent log losses.

Export of logs, down nearly one-half from 1970, continued as a safety valve or outlet for surpluses when log stocks were high. Surpluses of wood chips, accumulating during periods of over-production of pulp in the Province, were also relieved by export control.

personnel division

WESTERN RED CEDAR

PERSONNEL DIVISION

The most significant organizational decision involving staff changes was the establishment of a sixth forest district with headquarters at Williams Lake. Organization of the new Cariboo District commenced in late 1971 and will continue into 1972. In addition, one District Forester and one Division Head retired, and replacements resulted in several promotions and transfers, carrying into 1972.

A classification review of senior clerical and junior administrative positions was completed by the Civil Service Commission, resulting in some upgrading of our staff and some recommendations for downgrading on change of incumbent. The in-service organizational study results were referred to the Civil Service Commission, which made a further review and submitted recommendations, some of which are to be implemented on April 1, 1972.

COMMUNICATIONS AND TRAINING

There was no regular District Foresters' meeting, but the District Foresters and their assistants from each district visited Victoria headquarters individually to discuss problems with Victoria divisions. Ranger meetings were held at Vancouver and Nelson Districts and local and zone meetings were held in Kamloops, Prince George, and Prince Rupert Forest Districts.

Various divisions in Victoria held special meetings with field and district staff to resolve problems and standardize operations. The Personnel Officer and Assistant Personnel Officer took part in vocation day programmes in various secondary schools, as did other Forest Officers throughout the Province. Numbers of seminars and work shops were attended by employees throughout the year. One Forester, one Engineer, one Technical Forest Officer, and the Assistant Personnel Officer were selected for Class XVI of the public administration course under the Executive Development Training Plan, and one Forester and one Forest Protection Officer graduated from Class XIII of this programme, receiving diplomas in public administration from the University of Victoria.

Four employees graduated from the correspondence course in public administration and three employees were selected for Class VIII of this course. Informal training continued for junior Foresters and junior Engineers, as did formal training programmes for district field staff. Newly recruited Foresters and Engineers attended the one-week orientation course at the Forest Service Training School, as did newly appointed graduates from technological institutes in the Province.

ESTABLISHMENT, RECRUITMENT, AND STAFF TURNOVER

The permanent establishment of the Forest Service increased to 953, most of which were for the staff of the new Cariboo Forest District, but of special note was the establishment of a full-time co-ordinator for the Forest Productivity Committee. Also included were 10 new positions which provided one Forester and one Technical Forest Officer for each forest district for duties in recreation and environmental control.

During the year, 136 persons received Civil Service appointments and 127 left the Service. Thirty Forest Service employees received certificates for 25 years' continuous service. There were 12 retirements and 37 transfers of permanent staff. Three graduate Foresters and two graduate Engineers left the Service, while 18 graduate Foresters and five graduate Engineers were hired.

Turnover of Civil Service appointed staff, including full-time casual staff, was 7.6 per cent, a further decrease from 9.2 per cent in 1970. Vancouver Scaling, Vancouver District, and Prince Rupert District suffered the greatest disruption with 10.9 per cent, 10.8 per cent, and 10.5 per cent respectively. Prince George District was next with 9.5 per cent, followed by Nelson District at 7.6 per cent, Victoria Headquarters at 5.24 per cent, and Kamloops District being lowest at 3.6 per cent.

Professional staff turnover at 1.9 per cent was significantly below the 1970 figure of 5.7 per cent. Technical staff turnover at 4.1 per cent was not too much improved over the 1970 figure of 4.8 per cent, as was the clerical staff turnover at 14.9 per cent for 1971, compared with 15.7 per cent for 1970.

A total of 2,045 written applications for employment was processed by the Personnel Office in addition to those handled by district and divisional staff. This figure is almost double that for the previous year.

Promotional examinations for Draughtsmen were held by the Civil Service Commission and a number of our employees participated. Oral examinations were held at panel interviews to fill 46 positions. The Personnel Officer and Assistant Personnel Officer participated in filling 136 other positions, and 377 candidates wrote the Technical Forest Officer 1 examination for appointment as Assistant Ranger, in which 182 candidates qualified to fill 39 vacancies. Sixty-six candidates wrote the Technical Forest Officer 2 examination, of which 31 were successful and three candidates wrote and qualified on the Technical Forest Officer 3 examination. Twenty-four employees completed the advance course at the Forest Service Training School and 24 others completed a basic training course at the same establishment.

Classification reviews were requested for 39 positions. By the end of the year, 22 had been approved and the balance were still under consideration. Nine employees were registered as Professional Foresters.

Working conditions in general remained unchanged, but the Civil Service Commission is conducting a study on the relative isolation of headquarters throughout the Province to decide if it would be more realistic to provide some method of isolation pay rather than the present special living allowance for northern areas.

There were 660 accidental injuries suffered by employees, of whom 242 were temporary fire-fighters. Of the 418 for the regular and seasonal staff, 156 resulted in time-loss over one day and 262 required medical aid only. Our time-loss frequency was 23.2 accidents per million man-hours worked, as compared with 20.5 for 1970. Time-loss accidents for regular staff were 37.3 per cent of the total accidents for this group, as compared with 40.2 per cent for 1970.

Fifteen British Columbia Safety Council awards of merit were earned by various groups in the Service, which included six silver, eight bronze, and one silver on gold award. Since no district or division won a silver award or better, we were not qualified (for the first time) for the Prime Minister's Safety Award.

PERSONNEL DIRECTORY, 1971

(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
G. C. Warrack	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. M. Pogue	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 North), 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), W. E. Hall (Valemount), M. A. McRae (Prince George East), G. E. Meents (Prince George North), L. G. Espenant (Fort St. James), G. M. York (Quesnel), H. T. Barbour (Dawson Creek), J. L. Younghusband (Aleza Lake), H. Osborne (Vanderhoof), V. G. Bate (Fort St. John), P. F. Griffiths (Fort Fraser), D. A. Amonson (Summit Lake), H. L. Miskovich (Fort Nelson), G. E. Magee (Prince George), D. F. Wallin (Hixon), J. E. Little (Quesnel), K. Rohn (Quesnel), L. McQueen (Chetwynd), E. W. Hewitt (Mackenzie).

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

(Vacant) - District Forester
W. F. Tuttle (Acting District Forester) - 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), D. J. Neal (Bella Coola), W. H. Jones (Southbank), (vacant) (Lower Post), W. C. Waldron (Kitimat), M. F. Wilkinson (Stewart).

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 East), 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 West), H. B. Thompson (Beaverdell), C. N. Bellmond (Salmo), H. D. Hamilton (Revelstoke).

APPENDIX

TABULATED DETAILED STATEMENTS TO SUPPLEMENT THE REPORT OF THE FOREST SERVICE, 1971.

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STATUS OF RESEARCH PROJECTS IN 1971

Active at beginning of year	96
Terminated	2
New projects	10
Active at end of year	104

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	1
Choice and trial of species	7	4	3	1	1
Nursery practice	17	----	1	----	----
Direct-seeding	1	3	1	4	----
Planting	3	3	2	1	3
Spacing	3	4	2	2	1
Forest fertilization	2	----	----	----	----
Tending of stands	9	1	----	2	2
Statistics	2	----	----	----	----
Management: Economics	----	----	----	----	1
Totals	51	17	13	12	11

RESEARCH PUBLICATIONS, 1971

FRASER, A. R., and VAN DEN DRIESSCHE, PAULINE (1970): *Triangles, Densities, and Pattern in Point Populations.* Paper submitted to 3rd Conference of Advisory Group of Forest Statisticians, 13 pp.

ORR-EWING, A. L. (1970): *Racial Crossing with Douglas-fir.* Pp. 129–130 *in* papers presented 2nd Meeting Working Group on Quantitative Genetics, Sect. 22, I.U.F.R.O., Raleigh, N. Carolina, 1969. Publ.: Southern For. Expt. Stat., New Orleans, Louisiana.

SCHMIDT, R. L., and MARSHALL, J. R. (1970): *Micrometeorology and Reforestation.* Western Forestry and Conservation Association. Proceedings of Western Reforestation Coordinating Committee, pp. 47–51.

VAN DEN DRIESSCHE, R. (1970): *Influence of light intensity and photoperiod on frost-hardiness development in Douglas-fir seedlings.* Can. Jour. Bot. 48 (12):2129–2134.

——— (1971): *Growth of one-year-old Douglas fir plants at four spacings.* Ann. Bot. 35 (139):117–126.

——— (1971): *Response of conifer seedlings to nitrate and ammonium sources of nitrogen.* Plant and Soil 34:421–439.

———, CONNOR, D. J., and TUNSTALL, B. R. (1971): *Photosynthetic response of Brigalow to irradiance, temperature and water potential.* Photosynthetica 5 (3):210–217.

CONNOR, D. J., TUNSTALL, B. R., and VAN DEN DRIESSCHE, R. (1971): *An analysis of photosynthetic response in a Brigalow forest.* Photosynthetica 5 (3):218–225.

SUMMARY OF PLANTING, 1962–71

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												
1971[1]	9,627.0	22,696	55.0	128	11,603.8	31,735	82.4	236	4,756.0	11,370	26,124.2	66,165
1970	7,202.0	17,719	118.0	270	10,616.5	30,512	.....	.....	7,914.6	20,065	25,851.1	68,566
1969	4,791.0	11,356	107.0	201	9,981.6	28,666	.....	.....	5,673.6	14,946	20,553.2	55,169
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
Previously planted	89,774.0	108,169	9,944.2	14,472	39,954.3	88,649	.....	.....	3,970.9	7,333	143,643.4	218,623
Totals to date	130,710.9	207,740	15,468.9	27,815	121,768.3	325,383	82.4	236	48,550.6	131,614	316,581.1	692,788
Interior												
1971[1]	15,449.2	31,049	.....	.....	1,461.0	3,301	743.0	1,497	69.0	165	17,722.2	36,012
1970	7,201.0	14,672	.....	.....	753.0	2,094	40.0	66	166.0	369	8,160.0	17,201
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
Previously planted	3,588.0	5,862	.....	.....	965.7	1,939	.....	.....	234.1	315	4,787.8	8,116
Totals to date	41,854.9	88,077	.....	.....	6,555.3	18,268	783.0	1,563	1,076.8	2,255	50,270.0	110,163
All planted to date	172,565.8	295,817	15,468.9	27,815	128,323.6	343,651	865.4	1,799	49,627.4	133,869	366,851.1	802,951
All planted this year	25,076.2	53,745	55.0	128	13,064.8	35,036	825.4	1,733	4,825.0	11,535	43,846.4	102,177

[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	Schedule A	Total		
Vancouver	17[1]	2,671,025	1,050,640	3,721,665	6,596,522	4,048,610
Prince Rupert	5[1]	3,512,794	167,853	3,680,647	10,977,349	1,630,000
Prince George	2	471,576	2,404	473,980	532,992	184,000
Kamloops	7	726,253	1,841	728,094	776,982	199,310
Nelson	5	1,293,553	47,833	1,341,386	3,348,458	512,050
Totals	34	8,675,201	1,270,571	9,945,772	22,232,303	6,573,970

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

Schedule B is vacant Crown land.

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.

(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	14	70,530	219,417	35,396	325,343	364,666	330,115
Prince George	1	188	1,002	31	1,221	1,280	458
Nelson	2	1,499	4,719	3,389	9,607	10,158	4,312
Totals	17	72,217	225,138	38,816	336,171	376,104	334,885

Not Included Within Tree-farm Licences

Vancouver	22	108,354	303,243	42,857	454,454	483,790	379,126
Nelson	11	91,997	183,318	108,770	384,085	532,319	94,296 (346,096)
Totals	33	200,351	486,561	151,627	838,539	1,016,109	473,422 (346,096)
Grand totals	50	272,568	711,699	190,443	1,174,710	1,392,213	808,307 (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	18	4,399	555	4,954	5,360	1,365
Kamloops	4	1,115	146	1,261	1,420	260
Nelson	5	1,457	827	2,284	2,434	300
Totals	45	10,502	2,021	12,523	15,561	3,053

(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	3,270,979	1,553,463	5,282,630	10,403,812	2,866,240[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	14,942,534[3]	13,566,551[3]	30,463,590[3]	43,147,390[3]	6,649,510[2]
Kamloops	24	9,738,543	10,604,428[4]	21,356,513[4]	28,280,909[4]	4,070,530[2]
Nelson	14	2,779,447	4,972,013	8,577,603	14,287,482	2,168,780[2]
Totals	78	40,809,591	34,175,350	79,698,666	122,008,636	20,840,170

[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 1970 AND 1971 IN CUBIC FEET

Forest District	10-year Average, 1962–71	1970	1971	Increase	Decrease	Net Increase
Vancouver	779,737,517	841,763,523	826,157,819	----------	15,605,704	----------
Prince Rupert (C.)	129,810,297	176,445,647	176,739,025	293,378	----------	----------
Totals, Coast	909,547,814	1,018,209,170	1,002,896,844	----------	15,312,326	----------
Prince Rupert (I.)	86,284,708	102,832,928	107,557,355	4,724,427	----------	----------
Prince George	261,074,263	375,152,916	406,980,880	31,827,964	----------	----------
Kamloops	244,784,592	262,744,626	292,560,757	29,816,131	----------	----------
Nelson	154,500,444	173,688,797	187,085,336	13,396,539	----------	----------
Totals, Interior	746,644,007	914,419,267	994,184,328	79,765,061	----------	----------
Grand totals	1,656,191,821	1,932,628,437	1,997,081,172	----------	----------	64,452,735

(52) SPECIES CUT, ALL PRODUCTS, 1971, IN CUBIC FEET

Forest District	Fir	Cedar	Spruce	Lodgepole Pine	Hemlock	Balsam	White Pine
Vancouver	178,127,969	174,787,836	10,859,780	123,364	298,949,936	137,797,919	4,481,819
Prince Rupert (C.)	4,703,849	25,209,003	29,177,966	303,755	84,403,878	30,151,474	3,972
Totals, Coast	182,831,813	199,996,839	40,037,746	427,119	383,353,814	167,949,393	4,485,791
Prince Rupert (I.)	3,314	6,339,392	28,521,578	25,613,086	29,097,205	16,065,400	.....
Prince George	25,102,173	2,024,943	228,274,378	122,134,915	462,149	26,723,115	45,541
Kamloops	116,630,612	12,674,427	78,806,383	46,036,613	8,006,795	20,315,881	1,932,167
Nelson	17,551,947	24,921,460	70,138,041	18,290,205	18,900,368	24,190,270	3,279,879
Totals, Interior	159,288,046	45,960,222	405,740,380	212,074,819	56,466,517	87,294,666	5,257,587
Grand totals	342,119,864	245,957,061	445,778,126	212,501,938	439,820,331	255,244,059	9,743,378

Forest District	Yellow Pine	Cypress	Larch	Hardwood	Cotton-wood	Unspeci-fied	Total
Vancouver	12,298	15,634,658	.....	907,742	2,639,703	1,834,795	826,157,819
Prince Rupert (C.)	.....	628,083	.....	19,186	2,054,439	83,420	176,739,025
Totals, Coast	12,298	16,262,741	.....	926,928	4,694,142	1,918,215	1,002,896,844
Prince Rupert (I.)	.....	.....	.....	6,152	1,885,821	25,407	107,557,355
Prince George	.....	.....	2,505	2,014,262	196,899	.....	406,980,880
Kamloops	4,906,293	15	3,074,827	128,102	48,642	.....	292,560,757
Nelson	502,814	.....	8,852,587	16,790	440,975	.....	187,085,336
Totals, Interior	5,409,107	15	11,929,919	2,165,306	2,572,337	25,407	994,184,328
Grand totals	5,421,405	16,262,756	11,929,919	3,092,234	7,266,479	1,943,622	1,997,081,172

(53) TOTAL SCALE OF ALL PRODUCTS BILLED IN 1971 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	139,999,085	53,319,504	.....	2,197,975	3,214,499	3,910,478	202,641,541
Timber berths	11,495,864	.....	.....	.....	10,643,671	1,683,983	23,823,518
Timber leases	17,606,391	.....	.....	.....	.....	.....	17,606,391
Pulp leases	30,407,330	5,004,968	.....	.....	.....	.....	35,412,298
Pulp licences	2,674,110	8,585,044	.....	.....	.....	.....	11,259,154
Farm wood-lots	62,249	.....	7,963	126,146	20,563	22,479	239,400
Timber sales	202,322,281	56,173,678	60,302,327	337,221,132	222,220,271	117,950,209	996,189,898
Tree-farm licences	173,386,326	36,210,179	37,761,304	17,317,087	23,957,298	39,680,400	328,312,594
Beachcomb, trespass	9,634,852	2,284,998	238,588	.....	.....	.....	12,158,438
No mark visible	36,067,472	.....	.....	.....	.....	.....	36,067,472
Miscellaneous	449,088	47,022	309,529	37,650,092	8,301,784	3,950,040	50,707,555
Subtotals, Crown lands	624,105,048	161,625,393	98,619,711	394,512,432	268,358,086	167,197,589	1,714,418,259
Federal lands	5,276,387	1,914,485	824,704	574,149	2,056,306	61,106	10,707,137
Crown grants—							
To 1887	162,630,942	24,275	.....	59,700	4,971,209	1,916,924	169,603,050
1887–1906	12,397,987	4,802,201	76,798	.....	2,156,944	9,018,007	28,451,937
1906–1914	2,866,794	1,249,713	1,176,779	1,810,921	3,920,923	1,551,784	12,576,914
1914 to date	18,880,661	7,122,958	6,859,363	10,023,678	11,097,289	7,339,926	61,323,875
Totals	826,157,819	176,739,025	107,557,355	406,980,880	292,560,757	187,085,336	1,997,081,172

TIMBER SCALE BILLED IN BRITISH COLUMBIA DURING 1971 (BY MONTHS AND FOREST DISTRICTS)

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Vancouver—													
F.b.m.	35,397,926	23,545,017	34,843,541	39,962,121	48,884,030	65,056,429	52,594,250	43,652,130	52,338,588	52,480,596	64,015,535	35,142,413	547,912,576
Cubic feet	20,690,054	41,220,088	48,662,419	54,305,253	73,163,254	81,108,458	67,896,999	67,874,399	55,855,148	81,258,666	91,714,024	46,639,775	730,388,537
Lineal feet	144,569	136,333	125,143	132,258	99,788	238,664	230,948	102,731	131,220	282,150	211,754	767,623	2,603,181
Cords	1,941	1,075	1,751	2,027	1,954	2,344	2,300	3,208	2,127	2,407	2,101	2,983	26,218
All products, cu. ft.	26,881,184	45,351,760	54,722,087	61,261,529	81,569,305	92,342,378	77,058,857	75,522,250	64,887,058	90,447,095	102,746,664	53,367,652	826,157,819
Prince Rupert (C.)—													
F.b.m.	143,116	2,603,246	2,858,066	482,857	1,742,235	2,006,825	3,748,715	7,877,468	67,372	1,688,887	110,386	1,861,009	25,190,183
Cubic feet	10 936,059	7,591,200	16,406,976	13,457,255	15,286,212	18,439,912	13,891,504	15,385,721	11,960,265	16,701,497	16,425,070	16,038,339	172,520,010
Lineal feet	.....	.....	.....	19,000	.....	.....	.....	2,200	.....	6,666	.....	.....	27,866
Cords	.....	.....	10	.....	.....	.....	.....	.....	.....	.....	2	.....	12
All products, cu. ft.	10,959,912	8,025,083	16,884,130	13,551,982	15,576,590	18,774,389	14,516,302	16,699,058	11,971,494	16,987,983	16,443,588	16,348,514	176,739,025
Prince Rupert (I.)—													
F.b.m.	634,046	188,170	440,565	235,685	496,760	336,787	165,043	265,245	292,228	502,154	83,960	192,384	3,833,027
Cubic feet	7,989,100	5,777,139	16,331,469	10,014,261	6,325,375	7,468,586	3,615,772	12,370,238	5,306,577	13,048,896	10,590,524	7,786,958	106,624,895
Lineal feet	20,020	3,440	240	9,300	3,200	.....	1,800	2,105	.....	7,730	2,920	2,500	53,255
Cords	1	190	719	64	390	29	14	50	.....	711	80	134	2,382
All products, cu. ft.	8,114,462	5,827,643	16,478,147	10,068,664	6,450,587	7,530,040	3,647,161	12,421,945	5,357,398	13,212,952	10,612,625	7,835,731	107,557,355
Prince George—													
F.b.m.	2,744,543	4,711,999	3,226,966	2,824,257	3,252,209	96,169	1,016,898	2,626,521	2,142,641	1,893,521	4,967,960	5,113,396	34,617,080
Cubic feet	44,327,209	53,392,785	53,459,909	43,615,820	17,789,057	3,872,02[illegible]	22,854,262	33,155,493	39,787,506	36,217,695	26,626,691	25,622,494	400,720,944
Lineal feet	.....	.....	.....	.....	.....	.....	.....	.....	1,680	2,531	1,540	.....	5,751
Cords	128	133	296	691	85	94	258	180	125	95	107	160	2,352
All products, cu. ft.	44,817,312	54,225,610	54,050,704	44,176,156	18,363,192	3,898,18[illegible]	23,056,841	33,630,224	40,173,881	36,558,406	27,502;569	26,527,797	406,980,880
Kamloops—													
F.b.m.	1,937,769	3,038,886	3,459,882	5,996,113	2,369,839	3,509,372	3,336,775	2,245,398	3,005,435	3,050,831	2,171,339	2,244,464	36,366,103
Cubic feet	21,329,271	20,706,918	28,262,293	14,781,658	12,049,118	10,701,554	17,006,899	35,703,326	14,288,099	38,943,891	33,927,556	37,755,121	285,455,704
Lineal feet	89,190	62,583	71,585	56,755	.....	70,740	74,059	60,363	48,020	56,955	112,540	24,410	727,200
Cords	157	231	259	124	543	91	144	215	106	315	76	266	2,527
All products, cu. ft.	21,747,387	21,300,779	28,940,486	15,878,766	12,514,871	11,374,035	17,653,671	36,160,640	14,856,931	39,547,812	34,396,735	38,188,644	292 560,757
Nelson—													
F.b.m.	3,261,742	2,059,262	3,255,978	2,807,956	3,694,504	2,742,389	2,984,601	1,974,452	1,570,294	1,963,416	1,317,824	3,344,064	30,976,482
Cubic feet	13,474,246	11,077,284	13,625,938	10,777,667	16,635,619	6,917,71[illegible]	9,947,656	13,781,646	4,470,878	12,534,215	38,916,629	27,824,119	179 983,609
Lineal feet	123,537	112,233	26,972	193,945	181,631	112,611	204,077	153,375	90,028	280,549	146,070	169,540	1,794,568
Cords	1,378	360	402	418	604	1,045	1,039	340	346	698	544	1,097	8,271
All products, cu. ft.	14,266,840	11,550,314	14,250,320	11,422,184	17,429,336	7,575,134	10,682,259	14,252,222	4,816,182	13,001,735	39,267,612	28,571,198	187,085,336
Totals—													
F.b.m.	44,119,142	36,146,580	48,084,998	52,308,989	60,439,577	73,747,971	63,846,282	58,641,214	59,416,559	61,579,405	72,667,004	47,897,730	678,895,451
Cubic feet	118,745,939	139,765,414	176,749,004	146,951,914	141,248,635	128,508,24[illegible]	135,213,092	178,270,823	131,668,473	198,704,860	218,200,494	161,666,806	1,875,693,699
Lineal feet	377,316	314,589	223,940	411,258	284,619	422,015	510,884	320,774	270,948	636,581	474,824	964,073	5,211,821
Cords	3,605	1,989	3,437	3,324	3,576	3,603	3,755	3,993	2,704	4,226	2,910	4,640	41,762
All products, cu. ft.	126,787,097	146,281,189	185,325,874	156,359,281	151,903,881	141,494,164	146,615,091	183,686,339	142,062,944	209,755,983	230,969,793	170,839,536	1,997,081,172

(55) NUMBER OF ACRES OPERATING UNDER APPROVED ANNUAL ALLOWABLE CUTS, 1962–71

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	
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
1971	34	9,945,772	33	838,539	279	96,401	45	12,523	78	79,698,666	90,591,901

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

TOTAL SCALE OF ALL PRODUCTS FROM AREAS OPERATED UNDER APPROVED ANNUAL ALLOWABLE CUTS, 1962–71

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	
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
1971	34	526,487,770	33	41,846,000	279	370,563	88,712	45	237,239	78	967,711,464	1,536,282,473
Ten-year average, 1962–71	37	431,784,800	29	43,489,621	336	494,963	283,461	48	245,711	78	697,588,152	1,173,108,283

[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, 1971

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	814	292	1,679	2,785	2,880	2,312	5,192
Prince Rupert	177	207	608	992	2,577	2,016	4,593
Prince George	657	490	2,531	3,678	5,795	1,642	7,437
Kamloops	309	418	735	1,462	2,319	2,630	4,949
Nelson	206	202	1,049	1,457	1,803	1,437	3,240
Totals, 1971	2,163	1,609	6,602	10,374	15,374	10,037	25,411
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**
Ten-year average, 1961–71	5,075	.....	6,844	12,295	17,499	9,121	26,620

1 Figures not available prior to 1969.

TRESPASSES, 1971

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	70	418	1,301,157	2,940	53	.....	.....	23,412	.....	29	4	38,596.84
Prince Rupert	65	465	979,477	7,140	.....	.....	.....	.....	.....	.....	...	28,376.07
Prince George	82	527	1,376,421	.....	.....	.....	.....	.....	.....	.....	1	62,438.76
Kamloops	62	548	912,020	.....	.....	.....	1,885	.....	900	.....	1	93,000.83
Nelson	37	678	1,235,484	10,247	.....	.....	4,954	.....	.....	.....	...	48,039.35
Totals, 1971	321	2,636	5,804,619	20,327	53	.....	6,839	23,412	900	29	6	270,451.85
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
Ten-year average, 1962–71	420	3,063	4,204,097	42,263	861	212	9,029	92,117	4,204	735	8	260,672.54

(59) AREAS CRUISED FOR TIMBER SALES, 1971

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	185	24,448	630,060	8,000	2,420	2,700
Prince Rupert	51	15,119	504,090	.....	.....	.....
Prince George	76	28,305	489,330	.....	.....	.....
Kamloops	51	12,351	188,500	.....	.....	.....
Nelson	64	32,445	556,930	1,500	100	48,950
Totals, 1971	427	112,668	2,369,910	9,500	2,520	51,650
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**
Ten-year average, 1962–71	1,132	401,611	7,201,166	4,103,456	15,061	773,632

(60) TIMBER SALE LICENCE RECORD, 1971

Forest District	Sales Made	Sales Closed	Total Sales Existing	Total Area (Acres)	Area Paying Forest-protection Tax (Acres)
Vancouver	214	317	862	288,430	263,508
Prince Rupert	41	55	209	90,538	76,962
Prince George	87	254	402	215,817	151,278
Kamloops	76	258	524	271,616	232,393
Nelson	63	102	262	264,257	240,987
Totals	481	986	2,259	1,130,658	965,128
Cash sales	510	.....	.....	.....	.....
Total sales	991	.....	.....	.....	.....

(61)

TIMBER SALES AND CUTTING PERMITS (TIMBER SALE HARVESTING LICENCES) AWARDED BY FOREST DISTRICTS, 1971

Forest District	No. of Sales	No. of Cutting Permits	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	249	64	54,937	1,774,359	3,000	4,500	2,846	.....	1,000	.....	.....	8,373,187.93
Prince Rupert	63	57	36,429	1,402,190	14,166	2,080	579	350	400	.....	.....	3,870,524.00
Prince George	134	180	164,066	6,012,626	22,234	39,700	514	.....	.....	11,200	230	21,715,044.74
Kamloops	352	228	189,301	3,482,570	108,435	71,675	3,163	143	.....	12,500	280	15,311,207.79
Nelson	193	70	85,364	1,428,790	1,032,775	142,203	737	.....	.....	121,200	6,350	5,329,981.58
Totals, 1971	991	599	530,097	14,100,535	1,180,613	260,158	7,839	493	1,400	144,400	6,860	54,599,946.04
Totals, 1970	1,199	(1)	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	(1)	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	(1)	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	(1)	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	(1)	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	(1)	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	(1)	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	(1)	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	(1)	437,864	6,169,562	15,700,256	439,058	12,696	.....	10,442	272,000	220,930	18,959,259.42
Ten-year average, 1962–71	1,510	.....	347,869	5,970,087	4,269,739	297,860	14,574	650	13,977	430,977	27,930	25,394,616.10

1 Cutting permits not included before 1971.

(62) AVERAGE STUMPAGE PRICES, BY SPECIES AND FOREST DISTRICTS, ON CUTTING PERMITS OF TIMBER SALE HARVESTING LICENCES AND TIMBER SALES ISSUED DURING 1971, 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	279,944	9.30	0.55–20.10	313,128	3.07	0.55– 7.80	35,960	8.47	2.30–14.60	619,667	4.03	0.55–13.00	430,280	3.94	0.55–10.00
Prince Rupert (C.)	21,260	8.08	3.20–11.90	38,050	2.23	.55– 2.80	88,050	6.62	3.30–11.20	176,460	2.37	.55– 4.20	64,960	2.50	2.00– 2.70
Prince Rupert (I.)	.....	.....	.....	17,950	2.01	.90– 4.40	251,880	3.42	.55– 6.70	309,820	1.80	.90– 3.20	171,560	1.93	.80– 3.80
Prince George	216,930	8.16	1.10–17.30	26,392	1.33	.55– 3.20	3,624,970	3.96	.55–13.90	40,840	1.02	.55– 4.40	452,880	1.57	.55– 8.10
Kamloops	899,090	7.96	.55–20.90	233,478	2.56	.65– 8.20	980,882	4.14	.60–14.60	199,830	3.22	.55–11.30	426,460	1.85	.55– 7.90
Nelson	128,230	6.31	.55–16.70	112,150	3.01	.55–10.60	604,390	3.69	.55–12.20	136,300	2.77	.55–12.10	225,110	2.20	.55– 7.00
All districts	1,545,454	8.08	.55–20.90	741,148	2.77	.55–10.60	5,586,132	4.01	.55–14.60	1,482,917	3.06	.55–13.00	1,771,250	2.37	.55–10.00

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	2,790	8.25	2.30–17.00	5,300	3.34	0.55– 2.40	.....	.....	.....	87,290	3.00	0.55–10.90	1,774,359	4.71	0.55–20.10
Prince Rupert (C.)	.....	.....	.....	60	.55	.55– .55	.....	.....	.....	330	2.07	.55– 3.00	389,170	3.65	.55–11.90
Prince Rupert (I.)	.....	.....	.....	255,510	2.58	.55– 5.80	.....	.....	.....	6,300	.92	.55– 3.80	1,013,020	2.42	.55– 6.70
Prince George	1,000	.55	.55– .55	1,636,443	2.92	.55–12.50	.....	.....	.....	13,171	.74	.55–11.80	6,012,626	3.61	.55–17.30
Kamloops	26,700	14.76	3.30–23.80	675,730	2.15	.60– 6.90	11,150	8.44	4.50–17.30	29,250	3.92	.55–17.30	3,482,570	4.39	.55–23.80
Nelson	29,610	14.23	.55–23.10	140,020	2.30	.55– 9.40	48,910	6.60	.55–16.70	4,070	2.25	.55–12.20	1,428,790	3.73	.55–23.10
All districts	60,100	13.96	.55–23.80	2,713,063	2.67	.55–12.50	60,060	6.94	.55–17.30	140,411	2.86	.55–17.30	14,100,535	3.87	.55–23.80

(63) AVERAGE STUMPAGE PRICES RECEIVED, BY SPECIES AND FOREST DISTRICTS, ON TIMBER SCALED ON TREE-FARM LICENCE CUTTING PERMITS DURING 1971

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	179,170	8.84	0.55–15.89	385,492	3.11	0.55– 5.85	28,832	8.97	0.55–15.29	703,030	4.72	0.55– 9.60	381,940	4.82	0.55– 9.60
Prince Rupert	35	1.99	1.66– 2.09	99,483	1.39	.78– 5.50	149,072	3.37	1.52–19.00	360,403	1.30	.84– 5.75	91,993	1.11	.92– 2.10
Prince George	28,327	4.31	.55–15.80	.....	.....	.....	114,801	4.60	.55–12.40	3	2.07	.55– 7.30	25,529	2.25	.55– 7.90
Kamloops	69,508	7.04	.55–17.10	2,770	2.65	.80– 6.90	97,455	3.51	.60–12.70	2,185	2.63	.80– 8.30	32,352	1.47	.60– 4.80
Nelson	24,912	5.15	2.00–17.00	61,338	2.63	1.00– 8.50	131,991	4.09	1.50–11.40	80,436	2.10	.60–11.00	58,849	1.74	.70– 6.20
All districts	301,952	7.70	.55–17.10	549,083	2.74	.55– 8.50	522,151	4.16	.55–19.00	1,146,057	3.45	.55–11.00	590,663	3.64	.55– 9.60

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	28	1.22	0.55– 3.92	5,871	2.40	0.55–10.67	.....	.....	.....	39,543	2.54	0.55–10.61	1,723,906	4.82	0.55–15.89
Prince Rupert	16,800	.87	.84– 2.04	2	1.55	.....	.....	.....	.....	29,846	.64	.55– 1.84	747,634	1.67	.55– 7.38
Prince George	8,165	3.58	.55– 8.30	.....	.....	.....	.....	.....	.....	.....	.....	.....	176,825	4.16	.55–15.80
Kamloops	27,810	2.16	.60– 7.50	70	5.37	1.00–22.40	6,443	6.08	1.10–14.60	4,791	4.82	.90–10.60	243,384	4.17	.55–22.40
Nelson	13,604	2.86	.90– 9.80	9,810	15.14	.80–24.30	14,842	5.96	1.70–17.50	142	2.41	.80–12.60	395,924	3.48	.60–24.30
All districts	66,407	2.15	.55– 9.80	15,753	10.35	.55–24.30	21,285	6.00	1.10–17.50	74,322	1.90	.55–12.60	3,287,673	3.86	.55–24.30

(64) TIMBER CUT AND BILLED FROM TIMBER SALES AND TIMBER SALE HARVESTING LICENCES, 1971

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	200,323,591	3,957,998	28,109	3,863	.....	11,197	.....	.....	.....	.....	.....	4,315,686	160,540
Prince Rupert (C.)	56,168,278	.....	6,666	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Prince Rupert (I.)	60,208,678	.....	32,505	554	.....	24,550	.....	.....	200	.....	.....	.....	.....
Prince George	337,213,542	.....	.....	28	.....	4,840	.....	.....	.....	.....	.....	.....	.....
Kamloops	221,980,805	.....	175,407	783	.....	29,609	.....	.....	.....	.....	.....	.....	.....
Nelson	117,622,262	.....	532,643	212	.....	18,819	442,956	.....	542	.....	.....	107,436	162,200
Totals, 1971	993,517,156	3,957,998	775,330	5,440	.....	89,015	442,956	.....	742	.....	.....	4,423,122	322,740
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
Ten-year average, 1962–71	756,225,170	21,864,355	5,138,795	10,637	254	245,404	452,830	1,182	4,243	13,026	6,183	4,694,242	739,396

WOOD-PROCESSING PLANTS OF THE PROVINCE, 1971

Forest District	Operating								Shut Down			
	Sawmills				Shingle-mills		Number of Pulp Mills[1]	Number of Veneer and Plywood Plants[1]	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	Estimated Eight-hour Daily Capacity, M B.F.	Number	Estimated Eight-hour Daily Capacity, M B.F.
Vancouver	121	8,025	100	68	53	571	10	13	76	275	6	9
Prince Rupert	44	1,455	12	17	----	------	4	----	121	631	3	17
Prince George	135	5,463	48	56	3	3	4	4	221	1,544	----	----
Kamloops	231	5,987	56	72	5	16	1	7	52	489	1	2
Nelson	96	3,385	28	30	7	16	2	3	106	494	2	2
Totals, 1971	627	24,315	244	243	68	606	21	27	576	3,433	12	30
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
Ten-year average, 1962–71	1,121	25,780	------	------	59	719	----	----	431	2,858	11	36

[1] Figures not available prior to 1964.

(66) EXPORT OF LOGS (IN CUBIC FEET), 1971

Species	Grade No. 1	Grade No. 2	Grade No. 3	Ungraded and Lumber Reject	Total	Exportable[1]	Exported under Permit[2]
Fir	20,087	290,950	410,058	.....	721,095	336,528	384,567
Cedar	1,653,068	1,677,891	1,747,773	.....	5,078,732	374,622	4,704,110
Spruce	441,319	2,318,536	6,159,022	.....	8,918,877	477,676	8,441,201
Hemlock	234,896	807,806	4,735,895	.....	5,778,598	994,734	4,783,864
Balsam	.....	.....	.....	1,776,612	1,776,612	437,603	1,339,009
Lodgepole pine	3,275	49,836	397,237	.....	450,348	69,742	380,606
Cypress	183,622	946,023	2,806,712	.....	3,936,357	763,093	3,173,264
Hardwood	.....	.....	.....	547,813	547,813	386,228	161,585
Cottonwood	338,048	3,150	560,392	.....	901,590	790,199	111,391
Totals, 1971	2,874,315	6,094,192	16,817,090	2,324,425	28,110,022	4,630,425	23,479,597
Totals, 1970	3,222,351	7,629,924	30,800,174	8,396,211	50,048,660	13,455,734	36,592,926
Totals, 1969	598,829	3,031,347	17,270,817	5,040,281	25,941,274	10,655,349	15,285,925
Totals, 1968	3,619,562	4,482,835	20,111,753	2,695,646	30,909,796	16,265,130	14,644,666
Totals, 1967	2,021,374	6,886,800	21,499,239	3,495,473	33,902,886	11,418,913	22,483,973
Totals, 1966	1,625,172	4,553,790	14,666,899	2,821,874	23,667,735	7,348,820	16,318,915
Totals, 1965	559,204	1,794,367	5,974,462	1,440,105	9,768,138	6,458,926	3,309,212
Totals, 1964	624,730	2,431,755	5,131,602	637,616	8,825,703	4,741,111	4,084,592
Totals, 1963	578,164	2,691,635	10,465,035	1,730,420	15,465,254	8,518,306	6,946,948
Totals, 1962	628,956	1,869,241	7,691,944	2,306,588	12,496,729	7,375,840	5,120,889
Ten-year average, 1962–71	1,635,266	4,146,589	15,042,901	3,088,864	23,913,620	9,086,856	14,826,764

[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 the *Forest Act*.

(67) SHIPMENTS OF POLES AND OTHER MINOR FOREST PRODUCTS, 1971

Forest District and Product	Quantity Exported	Approximate Value, F.O.B.	Where Marketed		
			Canada	United States	Other Countries
		$			
Vancouver—					
Poles ... lin. ft.	4,008,184	2,889,554.00	793,802	2,942,880	271,502
Piling ... ,,	90,385	90,385.00	90,385	.....	.....
Cedar shakes ... pieces	23,420,119	2,797,408.00	323,135	23,096,984	.....
Prince Rupert—					
Poles ... lin. ft.	7,621	167,778.00	30,000	45,921	.....
Prince George—					
Poles ... ,,	63,250	64,165.00	43,065	20,185	.....
Posts ... pieces	22,500	1,745.00	1,500	21,000	.....
Shakes and shingles ... squares	3,515	68,360.00	3,515	.....	.....
Pulp chips ... units	44,160	397,440.00	15,760	.....	28,400
Kamloops—					
Poles ... lin. ft.	228,980	183,184.00	108,780	120,200	.....
Christmas trees ... pieces	99,923	79,938.00	5,447	94,476	.....
Nelson—					
Poles and piling ... lin. ft.	1,705,447	257,769.00	1,122,421	583,026	.....
Mine timbers ... ,,	169,047	42,261.75	169,047	.....	.....
Palings and pickets ... cords	22	1,100.00	22	.....	.....
Mine props ... ,,	129	8,385.00	129	.....	.....
Fence-posts ... ,,	4,960	202,864.00	1,580	3,380	.....
Shakes and shingles ... pieces	12,359,185	617,959.25	1,683,810	10,675,375	.....
Christmas trees ... ,,	746,818	485,431.70	140,431	606,387	.....
Pulp chips ... units	1,418	8,295.30	1,418	.....	.....
Total value, 1971	.....	8,394,023.00	.....	.....	.....
Total value, 1970	.....	14,677,761.00	.....	.....	.....

(68)

TIMBER MARKS ISSUED, 1962–71

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	10-year Average, 1962–71
Old Crown grants	300	313	356	328	341	277	328	361	220	197	302
Crown grants, 1887–1906	150	125	148	150	130	147	173	159	82	109	137
Crown grants, 1906–1914	164	161	164	172	144	163	190	203	111	126	160
Section 58, *Forest Act*	589	608	672	649	679	680	805	781	540	524	653
Stumpage reservations	109	141	149	133	63	61	48	48	19	7	78
Pre-emptions	9	13	7	8	3	6	9	13	10	4	8
Timber berths	12	12	9	14	10	4	1	11	6	2	8
Indian reserves	20	18	27	24	27	11	24	30	14	12	21
Section 24, *Forest Act*	.....	.....	.....	.....	20	214	347	502	418	384	189
Timber sales	1,991	2,183	2,281	1,614	1,126	1,149	1,241	1,327	1,199	991	1,510
Special marks and rights-of-way	90	97	121	153	117	95	101	143	89	115	112
Pulp leases	5	.....	.....	3	12	4	5	2	.....	.....	3
Pulp licences	2	.....	.....	.....	4	1	1	2	1	.....	1
Totals	3,441	3,671	3,934	3,248	2,676	2,812	3,273	3,582	2,709	2,471	3,182
Transfers and changes of marks	809	725	802	740	908	593	773	554	686	548	714

(70)

GRAZING PERMITS ISSUED, 1971

Forest District	Number of Permits Issued	Number of Stock Under Permit		
		Cattle	Horses	Sheep
Kamloops	1,131	141,520	3,176	1,433
Nelson	377	22,174	768	12
Prince George	407	14,976	2,240	39
Vancouver	5	102	2	.....
Totals, 1971	1,920	178,772	6,186	1,484
Totals, 1970	1,985[1]	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**

[1] Corrected figure.

(102) FIRE OCCURRENCES BY MONTHS, 1971

Forest District	March	April	May	June	July	August	September	October	Total	Per Cent
Vancouver	.....	7	55	21	94	137	25	2	341	11.8
Prince Rupert	.....	9	62	43	84	22	4	.....	224	7.7
Prince George	.....	14	195	28	80	220	9	.....	546	18.9
Kamloops	13	37	199	75	199	649	73	8	1,253	43.2
Nelson	.....	21	46	35	99	314	15	4	534	18.4
Totals	13	88	557	202	556	1,342	126	14	2,898	100.0
Per cent	0.4	3.0	19.2	7.0	19.2	46.3	4.4	0.5	100.0	.....
Ten-year average, 1962–71	21	63	367	387	660	687	165	24	2,374	.....
Per cent	0.9	2.7	15.5	16.3	27.8	28.9	6.9	1.0	100.0	.....

(103) NUMBER AND CAUSES OF FOREST FIRES, 1971

Forest District	Lightning	Recreational (Campers, Hunters, Fishermen, 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	103	38	29	74	13	1	3	39	.....	41	.....	341	11.8
Prince Rupert	72	30	7	29	12	6	3	21	6	35	3	224	7.7
Prince George	256	35	15	26	55	34	7	54	20	41	3	546	18.9
Kamloops	597	81	69	131	42	64	17	70	41	137	4	1,253	43.2
Nelson	299	27	55	49	7	.....	20	21	3	49	4	534	18.4
Totals	1,327	211	175	309	129	105	50	205	70	303	14	2,898	100.0
Per cent	45.8	7.3	6.0	10.7	4.5	3.5	1.7	7.1	2.4	10.5	0.5	100.0	.....
Ten-year average, 1962–71	885	221	165	293	106	119	52	176	40	280	37	2,374	.....
Per cent	37.3	9.3	7.0	12.3	4.5	5.0	2.2	7.4	1.7	11.8	1.5	100.0	.....

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

Causes	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	Total
Lightning	615	1,144	277	1,000	374	958	708	646	1,803	1,327	8,852
Recreational (campers, hunters, fishermen, etc.)	182	221	144	315	230	288	131	188	302	211	2,212
Railways operating	41	65	51	89	170	455	121	238	246	175	1,651
Smokers	162	220	129	310	281	464	179	374	501	309	2,929
Brush-burning (not railway or right-of-way clearing)	60	82	66	89	156	128	65	133	146	129	1,054
Range-burning	62	95	79	193	149	138	53	128	191	105	1,193
Road, power-, telephone-, and pipe-line construction	35	24	11	89	101	93	34	52	30	50	519
Industrial operations (logging, etc.)	109	141	81	223	164	248	126	206	255	205	1,758
Incendiary	25	62	45	24	14	42	23	19	70	70	394
Miscellaneous known causes	183	250	178	309	292	348	193	313	432	303	2,801
Unknown causes	62	41	59	44	36	54	14	21	27	14	372
Totals	1,536	2,345	1,120	2,685	1,967	3,216	1,647	2,318	4,003	2,898	23,735

(105)

FIRES CLASSIFIED BY SIZE AND DAMAGE, 1971

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	341	11.8	222	65.1	13.5	101	29.6	11.1	16	4.7	6.4	2	0.6	1.9	315	14	12
Prince Rupert	224	7.7	152	68.0	9.3	47	21.0	5.2	17	7.5	6.8	8	3.5	7.8	121	65	38
Prince George	546	18.8	257	47.0	15.7	159	29.0	17.5	86	16.0	34.5	44	8.0	42.7	438	46	62
Kamloops	1,253	43.2	702	55.5	42.8	442	35.9	48.8	92	7.3	37.0	17	1.3	16.5	1,139	66	48
Nelson	534	18.5	307	58.0	18.7	157	29.0	17.4	38	7.0	15.3	32	6.0	31.1	451	34	49
Totals	2,898	100.0	1,640	.....	100.0	906	.....	100.0	249	.....	100.0	103	.....	100.0	2,464	225	209
Per cent	100.0	.....	56.6	.....	.....	31.3	.....	.....	8.6	.....	.....	3.5	.....	.....	85.0	7.8	7.2
Ten-year average, 1962–71	2,374	.....	1,434	.....	.....	703	.....	.....	198	.....	.....	39	.....	.....	2,096	174	104
Per cent	100.0	.....	60.4	.....	.....	29.6	.....	.....	8.3	.....	.....	1.7	.....	.....	88.3	7.3	4.4

(106) DAMAGE TO PROPERTY OTHER THAN FORESTS, 1971

Forest District	Forest Products Cut, Logs, Lumber, Etc.	Buildings	Railway, Logging, and Sawmill Equipment	Miscellaneous	Total	Per Cent of Total
	$	$	$	$	$	
Vancouver	26,816	2,500	22,854	893	53,063	8.7
Prince Rupert	24,926	800	400	300	26,426	4.3
Prince George	32,770	6,250	29,729	61,089	129,838	21.3
Kamloops	2,530	189,790	200	43,114	235,634	38.7
Nelson	27,527	18,162	25,500	92,914	164,103	27.0
Totals	114,569	217,502	78,683	198,310	609,064	100.0
Per cent	18.8	35.7	12.9	32.6	100.0	.....
Ten-year average, 1962–71	185,583	63,479	145,709	60,983	455,709	.....
Per cent	40.7	13.9	32.0	13.4	100.0	.....

(107) DAMAGE TO FOREST COVER CAUSED BY FOREST FIRES, 1971—PART I

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	301	1,189	330	31,631	1,400	59,781
Prince Rupert	18,272	56,541	774	919,356	8,838	794,050
Prince George	49,393	123,265	18,248	3,025,047	151,148	3,731,259
Kamloops	22,584	49,032	9,127	504,696	16,033	314,116
Nelson	30,502	109,258	41,621	2,248,869	35,304	1,191,272
Totals	121,052	339,285	70,100	6,729,599[1]	212,723	6,090,478[1]
Per cent	13.9	100.0	20.7	51.8	24.4	46.9
Ten-year average, 1962–71	41,502	94,796	30,605	1,870,409	56,553	1,509,777
Per cent	18.2	100.0	32.2	53.5	24.9	43.1

[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.

DAMAGE TO FOREST COVER CAUSED BY FOREST FIRES, 1971—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	311	90	269	228	176	35	114	6	1,064	267	3,725	859	91,948
Prince Rupert	342	.....	48,335	751	9,954	2,456	46	5	62,811	14,235	148,598	55,767	1,730,853
Prince George	21,430	85	9,741	29,258	136,588	34,016	11,277	631	150,976	37,183	530,638	105,017	6,857,394
Kamloops	918	170	6,162	7,103	3,024	748	1,125	1,251	6,239	1,570	56,255	39,905	829,484
Nelson	19,411	1	450	13,167	25,580	7,041	185	9	18,215	4,545	129,648	67,637	3,464,903
Totals	42,412	346	64,957	50,507	175,322	44,296	12,747	1,902	239,305	57,800	868,864	269,185	12,974,582
Per cent	4.8	0.4	7.4	0.4	20.1	0.3	1.5	0.1	27.5	0.5	100.0	79.3	100.0
Ten-year average, 1962–71	12,114	2,102	10,046	94,004	56,845	14,680	9,354	754	39,092	9,656	227,608	64,191	3,499,280
Per cent	5.3	0.9	4.4	2.7	25.0	0.4	4.1	0.0	17.2	0.3	100.0	67.8	100.0

FIRE CAUSES, AREA BURNED, FOREST SERVICE COST, AND TOTAL DAMAGE, 1971

Causes	Number	Per Cent	Acres	Per Cent	Cost	Per Cent	Damage	Per Cent
					$		$	
Lightning	1,327	45.8	717,539	82.6	6,673,056	66.3	11,452,633	84.3
Recreational (campers, hunters, fishermen, etc.)	211	7.3	18,405	2.1	525,489	5.2	378,567	2.8
Railroads operating	175	6.0	1,903	0.3	100,048	1.0	93,822	0.7
Smokers	309	10.7	8,853	1.0	920,433	9.1	487,258	3.6
Brush-burning (not railway or right-of-way clearing)	129	4.5	24,906	2.9	191,130	1.9	258,629	1.9
Range-burning	105	3.5	41,970	4.8	314,564	3.1	176,609	1.3
Road, power-, telephone-, and pipe-line construction	50	1.7	458	.....	48,504	0.5	30,554	0.2
Industrial operations (logging, etc.)	205	7.1	52,870	6.1	991,109	9.9	666,389	4.9
Incendiary	70	2.4	1,291	0.2	141,505	1.4	26,117	0.2
Miscellaneous known causes	303	10.5	568	.....	108,560	1.1	12,303	0.1
Unknown causes	14	0.5	101	.....	47,289	0.5	765	.....
Totals	2,898	100.0	868,864	100.0	10,061,687	100.0	13,583,646	100.0

(109)

COMPARISON OF DAMAGE CAUSED BY FOREST FIRES IN LAST 10 YEARS

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	Total, 10 Years
Total number of fires	1,536	2,345	1,120	2,685	1,967	3,216	1,647	2,318	4,003	2,898	23,735
Area burned (acres)	45,617	46,346	7,746	307,132	54,788	244,483	33,381	406,763	260,958	868,864	2,276,078
Standing timber destroyed or damaged (M cu. ft.)	3,972	7,953	306	114,585	3,506	170,555	5,361	158,147	144,287	339,285	947,957
Amount salvable (M cu. ft.)	1,279	3,357	117	40,872	1,453	110,136	759	21,499	56,474	70,100	306,046
	$	$	$	$	$	$	$	$	$	$	$
Damage to forests	311,445	308,475	25,793	5,194,473	757,017	4,751,919	455,872	6,776,020	3,437,205	12,974,582	34,992,801
Damage to other forms of property	280,700	225,797	151,338	567,162	164,352	927,201	223,400	663,177	744,901	609,064	4,557,092
Total damage	592,145	534,272	177,131	5,761,635	921,369	5,679,120	679,272	7,439,197	4,182,106	13,583,646	39,549,893

(110)

FIRES CLASSIFIED BY FOREST DISTRICT AND COST PER FIRE OF FIRE-FIGHTING, 1971

Forest District	Total Fires	Forest Service Cost			Extinguished Without Cost			Cost Money to Extinguish							
		Total	Per Cent	Average Expenditure per Fire	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	341	366,127	3.6	1,074	49	14.4	1.7	292	85.6	10.1	131	111	37	2	11
Prince Rupert	224	386,932	3.7	1,727	65	29.0	2.2	159	71.0	5.5	126	20	1	2	10
Prince George	546	3,795,990	36.9	6,952	53	10.0	1.8	493	90.0	17.0	74	180	137	50	52
Kamloops	1,253	2,827,523	27.5	2,257	232	18.5	8.0	1,021	81.5	35.3	372	412	182	18	37
Nelson	534	2,918,359	28.3	5,465	108	20.1	3.7	426	79.9	14.7	148	136	85	18	39
Totals	2,898	10,294,391[1]	100.0	3,552	507	.....	17.4	2,391	.....	82.6	851	859	442	90	149
Per cent	100.0	.....	.....	.....	17.5	.....	.....	82.5	.....	.....	29.4	29.6	15.3	3.1	5.1
Ten-year average, 1962–71	2,374	3,456,336	100.0	1,456	549	.....	.....	1,825	.....	.....	872	641	213	39	60
Per cent	100.0	.....	.....	.....	23.1	.....	.....	76.9	.....	.....	36.9	27.0	8.9	1.6	2.5

[1] Cost correct to date. Subject to later revision. Detailed final costs are published one year in arrears in the table "Forest Protection Expenditures" in each annual report.

(111) AREAS OF LOGGING SLASH DISPOSED, 1971

Forest District	Acres Abated by Industry	Acres Abated by Forest Service	Total
Vancouver	44,514	398	44,912
Prince Rupert	20,532	1,549	22,081
Prince George	13,200	1,430	14,630
Kamloops	18,890	756	19,646
Nelson	17,812	822	18,634
Totals	114,948	4,955	119,903

(141) FOREST REVENUE, 1967–71

	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	825,100.86	676,038.52	703,048.63	668,254.04	640,458.88
Timber berth rentals and fees	13,436.63	141,074.38	128,103.62	123,123.68	112,947.83
Timber lease rentals and fees	76,121.31	87,083.55	90,500.60	92,895.76	93,633.27
Timber sale rentals and fees	881,812.16	899,849.28	882,229.95	898,484.23	798,919.11
Timber sale stumpage	34,732,239.51	44,390,570.94	78,293,115.07	53,524,665.01	49,680,565.02
Timber sale cruising and advertising	229,857.61	250,745.80	213,844.25	163,321.01	166,647.42
Timber royalties	3,509,720.06	4,954,555.27	6,329,417.22	6,217,109.85	5,553,861.92
Grazing permits and fees	310,718.84	350,351.93	384,123.83	438,003.68	469,636.16
Forest protection tax	579,928.17	947,389.12	993,509.64	1,006,742.58	1,123,517.24
Miscellaneous	394,388.82	473,324.50	428,260.52	669,194.53	735,683.76
Weight-scaling	396,894.14	635,742.30	1,033,160.25	1,149,637.48	1,514,347.62
Totals	41,950,218.11	53,806,725.59	89,479,313.58	64,951,431.85	60,890,218.23

AMOUNTS CHARGED AGAINST LOGGING OPERATIONS, 1971

Forest District	Royalty	Miscel-laneous	Scaling Fund		Stumpage	Rentals, Cruising, Advertising, Transfer Fees	Total
			Scaling Expenses	Scaling Fees			
	$	$	$	$	$	$	$
Vancouver	3,799,692.91	91,763.91	363,478.12	1,860,206.89	21,740,457.17	998,582.35	28,854,181.85
Prince Rupert	994,276.50	328,717.64	59,629.37	247,692.91	5,031,644.07	343,705.91	7,005,666.40
Prince George	181,268.56	614,615.19	.....	.....	12,055,977.67	386,332.95	13,238,194.37
Kamloops	393,094.74	568,854.52	.....	.....	11,182,981.85	303,809.47	12,448,740.58
Nelson	150,903.79	326,705.83	.....	.....	5,336,297.59	309,205.94	6,123,113.15
Totals, 1971	5,519,236.50	1,930,657.09	423,107.49	2,107,899.80	55,347,358.35	2,341,636.62	67,669,895.85
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	58,039,564.20
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

(143) AMOUNTS CHARGED AGAINST LOGGING OPERATIONS, FISCAL YEAR 1970/71

Forest District	Royalty	Miscel-laneous	Scaling Fund		Stumpage	Rentals, Cruising, Advertising, Transfer Fees	Total
			Scaling Expenses	Scaling Fees			
	$	$	$	$	$	$	$
Vancouver	3,704,037.82	112,757.61	330,560.76	1,754,492.26	20,069,937.46	789,154.94	26,760,940.85
Prince Rupert	1,028,247.40	267,947.84	51,940.66	244,578.60	4,588,242.05	270,011.01	6,450,967.56
Prince George	210,457.28	575,322.47	.....	.....	10,532,397.77	314,735.93	11,632,913.45
Kamloops	397,140.05	555,958.37	.....	.....	6,174,398.70	282,313.68	7,409,810.80
Nelson	168,615.58	205,924.40	.....	.....	4,193,881.33	258,052.91	4,826,474.22
Totals, 1970/71	5,508,498.13	1,717,910.69	382,501.42	1,999,070.86	45,558,857.31	1,914,268.47	57,081,106.88
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

(144) FOREST REVENUE, FISCAL YEAR 1970/71

	$
Timber licence rentals and fees	680,677.60
Timber berth rentals and fees	108,582.53
Timber lease rentals and fees	94,379.52
Timber sale rentals and fees	864,070.03
Timber sale stumpage	47,596,110.72
Timber sale cruising and advertising	148,008.10
Timber royalties	5,766,639.32
Grazing permits and fees	449,382.25
Forest-protection tax	1,030,555.21
Miscellaneous	755,486.41
Weight-scaling	1,193,970.62
Total	58,687,862.31

(145) FOREST SERVICE EXPENDITURES, FISCAL YEAR 1970/71

	$
General administration, protection, and management of forests	18,976,582.75
Reforestation and forest nurseries	3,473,569.85
Forest research	199,597.08
Public information and education	60,538.70
Forest Service Training School	155,118.27
Grant to Canadian Forestry Association	17,500.00
Engineering services and forest-development roads	2,809,264.34
Fire suppression	9,765,199.87
Forest inventory	985,076.13
Silviculture	1,309,714.33
Grazing Range Improvement Fund[1]	210,462.19
Peace River community pastures	19,997.30
Forestry and Correction Camp Programme	17,434.27
Total	38,000,055.08

[1] Statement provided elsewhere.

(146)

SCALING FUND

	$
Deficit, April 1, 1970	158,370.92
Collections, fiscal year 1970/71	2,469,230.34
	2,310,859.42
Expenditures, fiscal year 1970/71	2,516,112.55
Deficit, March 31, 1971	205,253.13
Collections, nine months, April to December, 1971	1,914,588.59
	1,709,335.46
Expenditures, nine months, April to December, 1971	2,099,162.83
Deficit, December 31, 1971	389,827.37

(147)

GRAZING RANGE IMPROVEMENT FUND

Surplus, April 1, 1970	11,814.19
Government contribution (sec. 13, *Grazing Act*)	189,819.61
	201,633.80
Expenditures, fiscal year 1970/71	210,024.61
Deficit, March 31, 1971	8,390.81
Government contribution (sec. 13, *Grazing Act*)	224,691.12
	216,300.31
Expenditures, nine months, April to December, 1971	129,836.53
Surplus, December 31, 1971	86,563.78

(148)

PEACE RIVER POWER TIMBER SALVAGE

Expenditures, fiscal year 1970/71	3,778,261.24
Recovered from British Columbia Hydro and Power Authority	1,875,377.99
Balance	1,902,883.25

(151) DISTRIBUTION OF PERSONNEL, 1971

Personnel	Cariboo	Vancouver	Prince Rupert	Prince George	Kamloops	Nelson	Victoria	Total
Continuously Employed								
Deputy Minister, Chief Forester, and Assistant Chief Foresters	.....	.....	.....	.....	.....	.....	4	4
Division Foresters	.....	.....	.....	.....	.....	.....	6	6
Director of Grazing	.....	.....	.....	.....	.....	.....	1	1
Forest Counsel and Personnel Officers	.....	.....	.....	.....	.....	.....	3	3
District Foresters and Assistant District Foresters	1	2	2	2	2	2	.....	11
Foresters	.....	15	12	18	16	13	117	191
Agrologists and Agrologists-in-Training	.....	.....	.....	2	6	2	.....	10
Engineers	2	.....	1	1	2	1	33	40
Forest Protection Officers	.....	2	1	1	1	2	3	10
Technical Forest Officers	.....	111	88	137	134	113	62	645
Superintendent of Scaling and Assistants	.....	2	.....	75	.....	.....	.....	77
Scalers, Official	.....	88	1	.....	.....	35	.....	124
Scalers, Official, temporary	.....	98	32	.....	57	.....	.....	187
Comptroller, Accountant, and Audit Assistants	.....	2	.....	.....	.....	.....	7	9
Engineering, Mechanical and Radio	.....	6	3	4	7	4	17	41
Public Information Assistants	.....	.....	.....	.....	.....	.....	3	3
Reforestation, Research, and Survey Assistants	.....	.....	.....	2	2	1	51	56
Nursery Superintendents	.....	1	.....	.....	.....	.....	8	9
Draughtsmen and Mapping Assistants	.....	5	5	6	6	4	34	60
Clerks, Stenographers, and Messengers	2	85	39	42	34	26	110	338
Superintendent and Foremen, Forest Service Maintenance Depot	.....	.....	.....	.....	.....	.....	8	8
Mechanics, Carpenters, and Technicians	.....	4	9	8	5	7	125	158
Launch Crewmen	.....	14	8	.....	.....	.....	1	23
Forest Assistants	.....	39	28	32	36	24	8	167
Truck, Tractor, and Equipment Operators	.....	6	3	4	10	1	36	60
Foremen	.....	4	5	5	5	1	24	44
Miscellaneous	3	12	5	9	12	3	64	108
Totals, continuous personnel	8	496	242	348	335	239	723	2,391
Seasonally Employed								
Technical Forest Officers	.....	9	.....	.....	5	1	6	21
Patrolmen	.....	2	.....	.....	.....	1	.....	3
Lookoutmen	.....	31	21	32	31	41	.....	156
Dispatchers, Radio Operators, and Clerks	.....	.....	1	4	6	3	1	15
Fire-suppression Crewmen	.....	76	.....	20	69	37	4	206
Reforestation—Snag-fallers, Planters, etc.	.....	.....	.....	.....	602	.....	3,153	3,755
Truck, Tractor, and Equipment Operators	.....	.....	6	4	4	6	15	35
Student and Survey Assistants and Engineering Aides	.....	101	20	101	111	.....	248	581
Forest Assistants	.....	3	1	4	7	127	28	170
Foremen	.....	5	1	6	29	2	206	249
Miscellaneous	3	33	7	23	76	60	120	322
Totals, seasonal personnel	3	260	57	194	940	278	3,781	5,513
Totals, all personnel	11	756	299	542	1,275	517	4,504	7,904

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