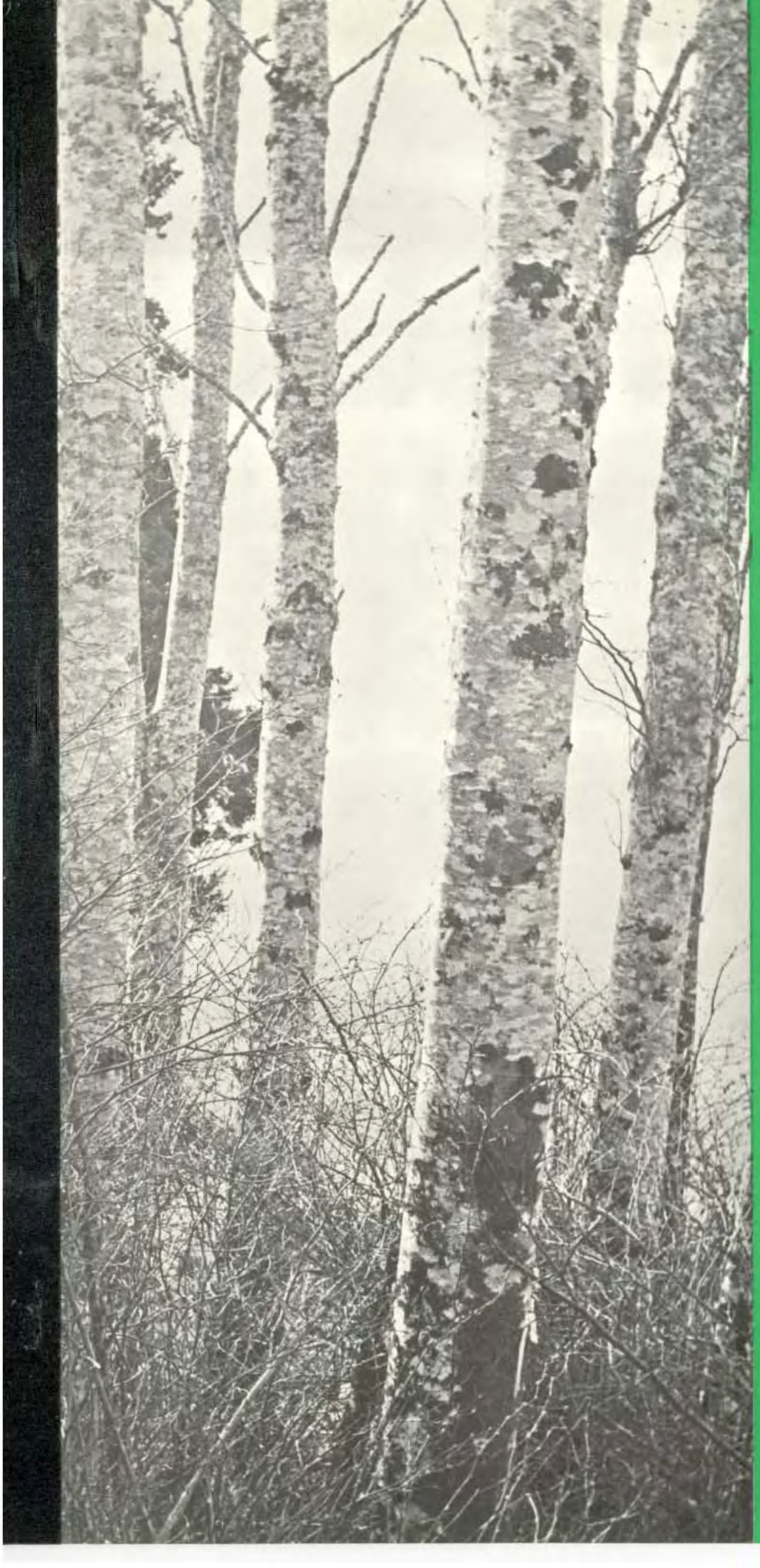

British Columbia's Neglected Hardwood Resource

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BRITISH COLUMBIA'S NEGLECTED HARDWOOD RESOURCE

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PREFACE

This report results from a study carried out for the Special Studies Division of the British Columbia Forest Service by the Pacific Forest Research Centre. It was prompted by an inadequate knowledge of inventory, manufacturing and markets for hardwoods in British Columbia.

Although hardwoods form a minor portion of the total British Columbia forest resource (less than 3%), they are generally under-utilized. In some areas, such as northeastern British Columbia, they constitute a considerable proportion of the available inventory and offer an opportunity for the development of important local industries.

The report presents: 1) a discussion of the inventory of standing hardwoods in British Columbia, and 2) a review of present and potential production of and markets for British Columbia hardwoods. Its aim is not to provide an in-depth analysis of the hardwood products sector of the British Columbia forest industry; rather, it is an attempt to point out some of the problems and opportunities facing this industry.

For further information on hardwood inventories the reader should contact the Inventory Division, British Columbia Forest Service, Parliament Buildings, Victoria, B.C. More detailed information on markets, products and inventory is available from the Pacific Forest Research Centre and the Western Forest Products Laboratory, 6620 N.W. Marine Drive, Vancouver, B.C.

ABSTRACT

Hardwood timber in British Columbia, which totals 7,339 million cubic feet (207.82 million cubic meters), is a relatively neglected resource. In 1973, harvest amounted to 20.4 million cubic feet (0.58 million cubic meter), which represented 17 percent of allowable cut. Markets for British Columbia hardwoods probably exist, but are largely undeveloped for a number of reasons, such as: 1) small size of firms, 2) geographic dispersion of firms, 3) poor quality control, and 4) high transportation costs. Key markets to be developed are British Columbia-Alberta and the midwestern United States.

Résumé

L'auteur révèle que la ressource des boisés feuillus en Colombie-Britannique, qui forment un total de 7,339 millions de pieds cubes (207.82 millions de mètres cubes), est relativement négligée. En 1973, la récolte équivalait à 20.4 millions de pieds cubes (0.58 millions de mètres cubes), qui représente 17% de la coupe permissible. Tout probablement, il existe des marchés pour le bois feuillu de cette province, mais ceux-ci restent très peu exploités, ce pour plusieurs raisons. Par exemple, 1) les exploitants sont petits, 2) la dispersion géographique des exploitants, 3) un piètre controle de la qualité du bois, et 4) des coûts élevés de transports. Les marchés-clés propices sont la Colombie-Britannique et l'Alberta, et l'ouest central des États-Unis.

INTRODUCTION

The forest industries of British Columbia have historically been a mainstay of the provincial economy. Expanding through the years, they account for 44% of provincial value-added and 28% of direct and indirect employment. In 1972, value-added attributable to forest industries in British Columbia reached $3.75 billion (F.L.C. Reed and Associates 1973).

Historically, in the development of these industries, hardwoods have been neglected. Yet, total mature hardwood volume is 7,339 million cubic feet (207.82 million cubic meters) which, though appearing trivial compared to a softwood inventory of 268,399 million cubic feet (7,600.27 million cubic meters), represents a significant volume.

The hardwood timber of British Columbia consists of six major species: red alder, *Alnus rubra;* trembling aspen, *Populus tremuloides;* balsam poplar, *Populus balsamifera;* bigleaf maple, *Acer macrophyllum;* white birch, *Betula papyrifera,* and black cottonwood, *Populus trichocarpa.* Balsam poplar and trembling aspen are usually sold as a single species and, at times, are lumped with black cottonwood.

INVENTORY

The mature hardwood inventory of British Columbia, measured to close utilization standards[1/], consists of 2,019 million cubic feet (57.17 million cubic meters) of black cottonwood, 4,105 million cubic feet (116.24 million cubic meters) of trembling aspen and balsam poplar, 709 million cubic feet (20.08 million cubic meters) of white birch, 47 million cubic feet (13,34 million cubic meters) of red alder, and 35 million cubic feet (0.99 million cubic meters) of bigleaf maple.

Bigleaf maple and alder are coastal species; trembling aspen and balsam poplar are interior species, while black cottonwood is found throughout southern British Columbia, in the coastal and interior zones (Figs. 1-6).

Distribution of volume between and within forest districts is also uneven (Figs. 7-12). Hardwood inventories are greatest in the northeast and north-central Interior, which have the least forest industry development. Hardwoods thus offer a challenge and an opportunity for new industry.

The highest proportion of hardwoods occurs in the Prince George Forest District, where they constitute 8.41% of gross inventory. Sixty-seven percent of this inventory consists of trembling aspen and balsam poplar. The eight survey units in which hardwoods account for more than 10% of total mature inventory are: Blueberry P.S.Y.U.[2/] (14%); Dawson Creek S.S.A.[3/]

[1/] Close utilization standards are 7.1 + inches d.b.h.-Interior B.C., and 9.1 + inches d.b.h. - Coastal B.C.

[2/] Public Sustained Yield Unit

[3/] Special Sale Area

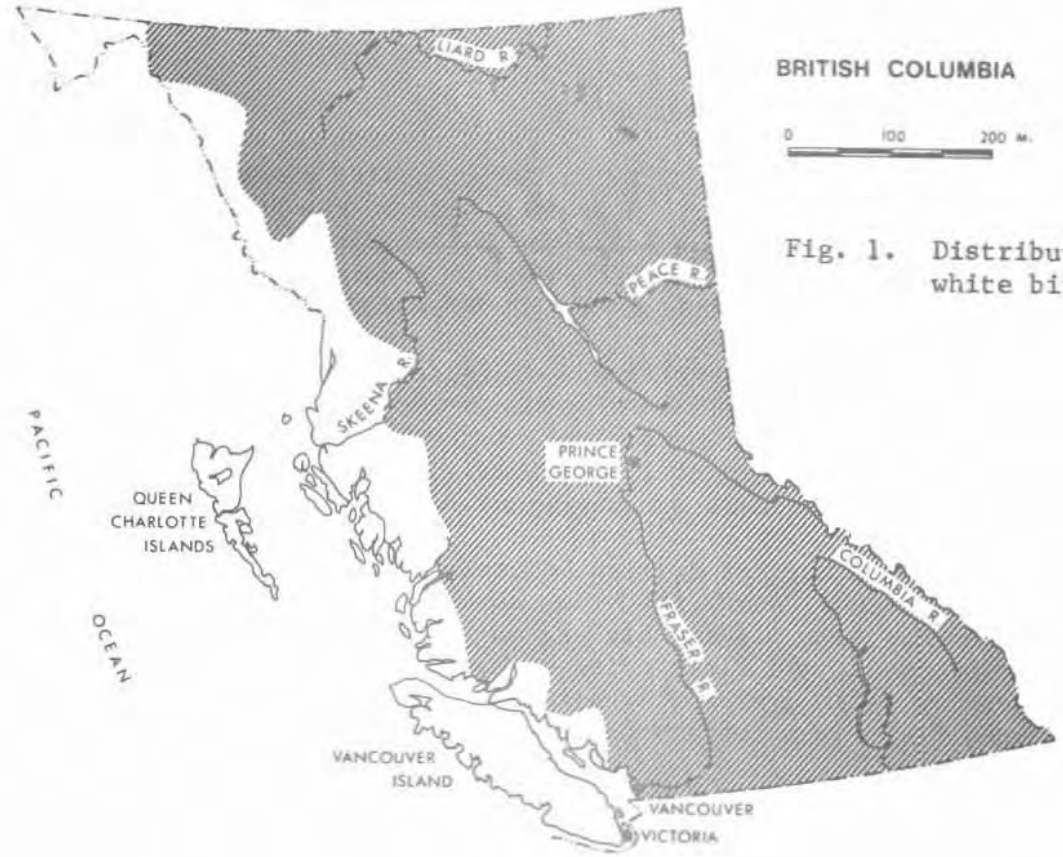


Fig. 1. Distribution of white birch

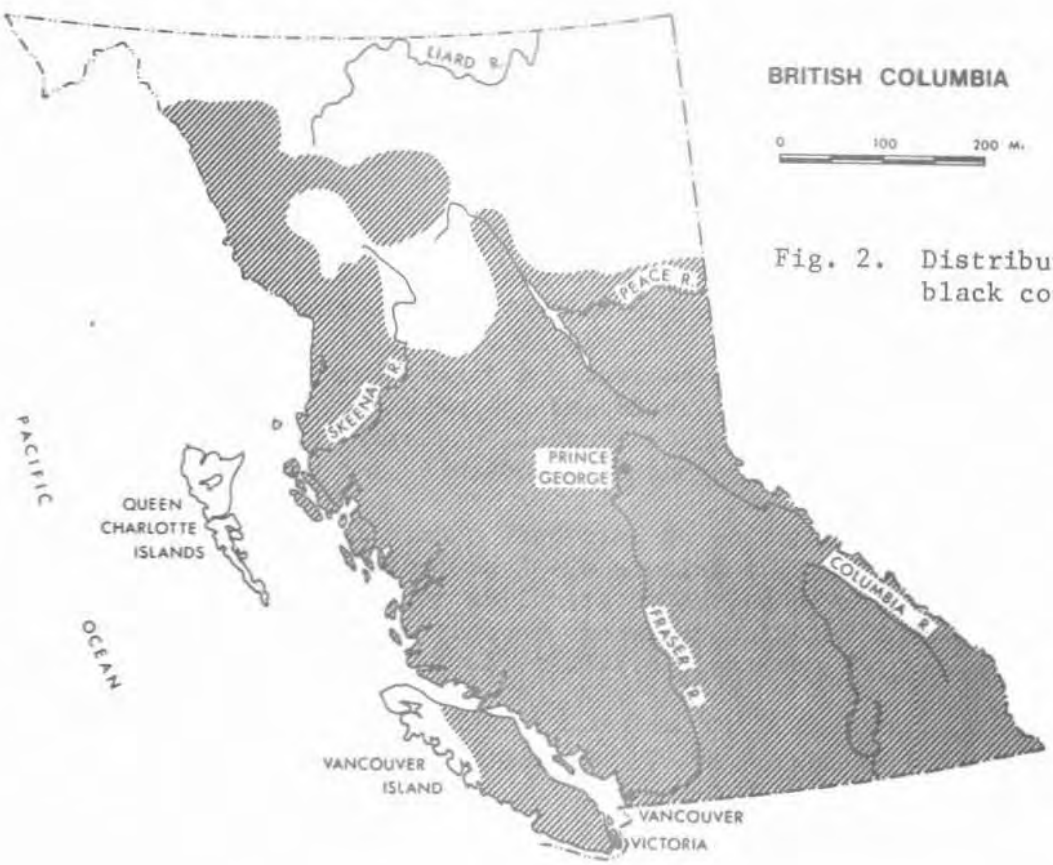


Fig. 2. Distribution of black cottonwood

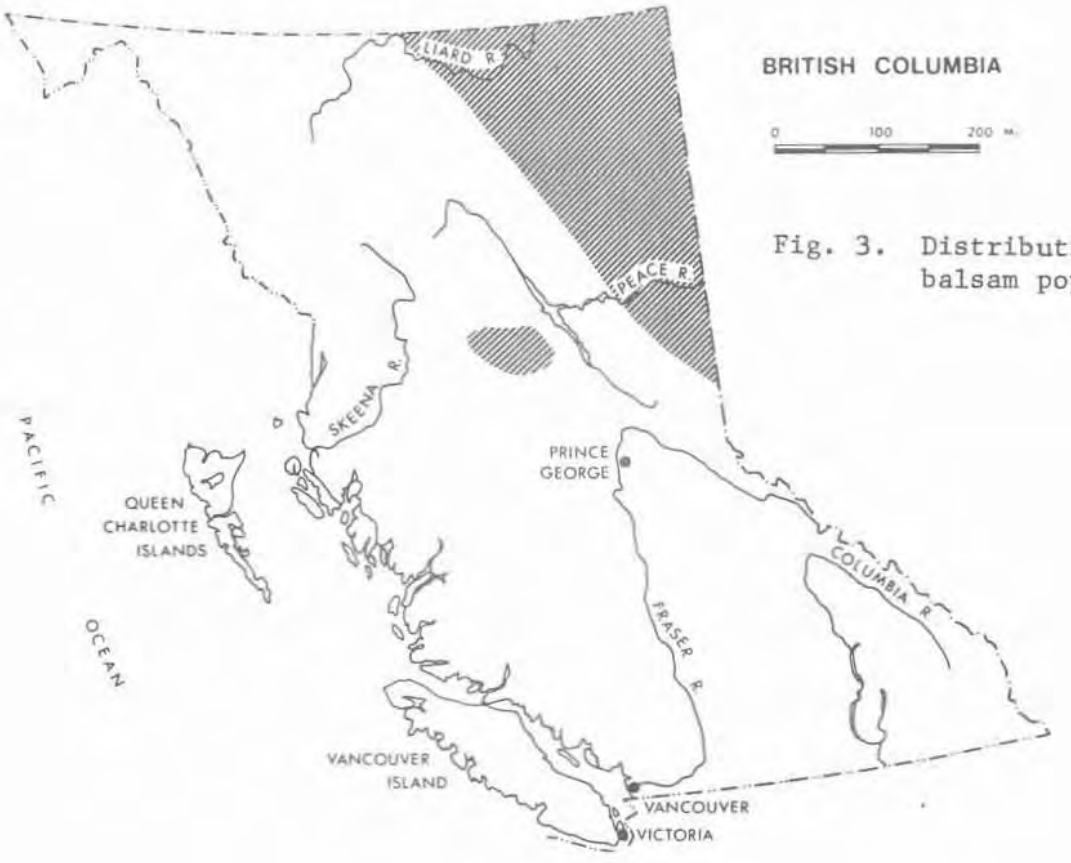


Fig. 3. Distribution of balsam poplar

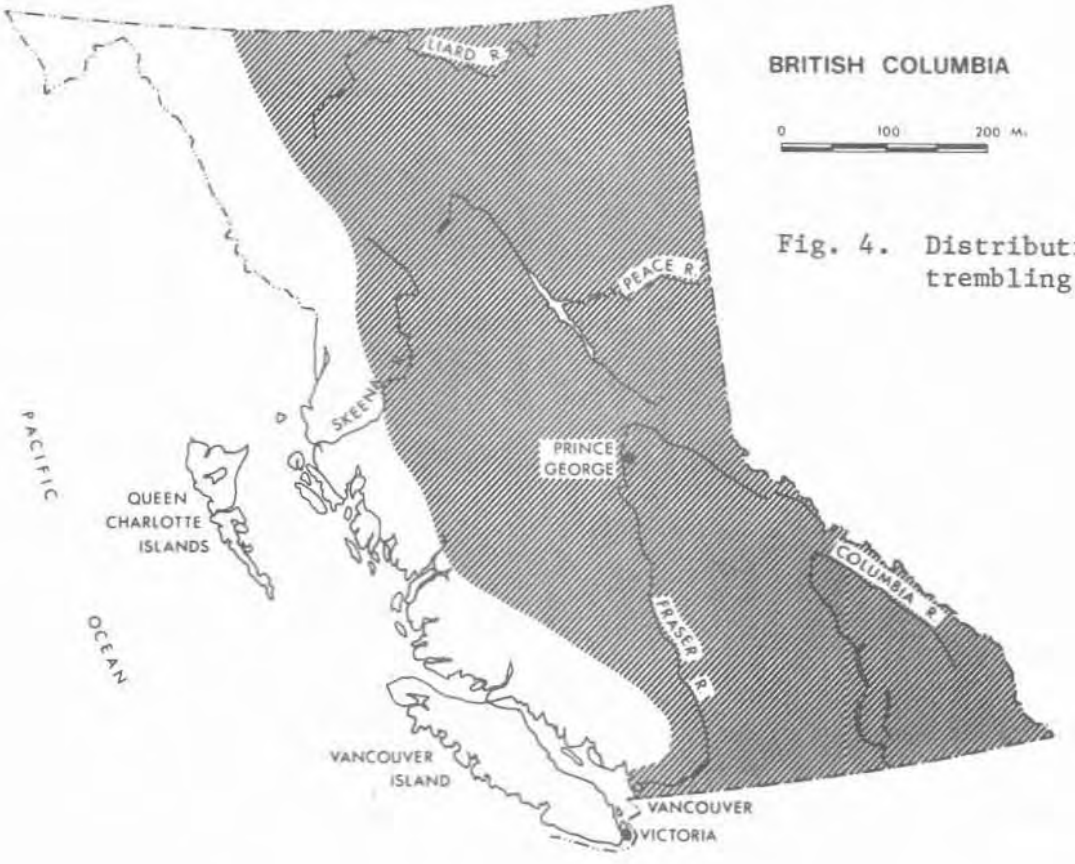


Fig. 4. Distribution of trembling aspen

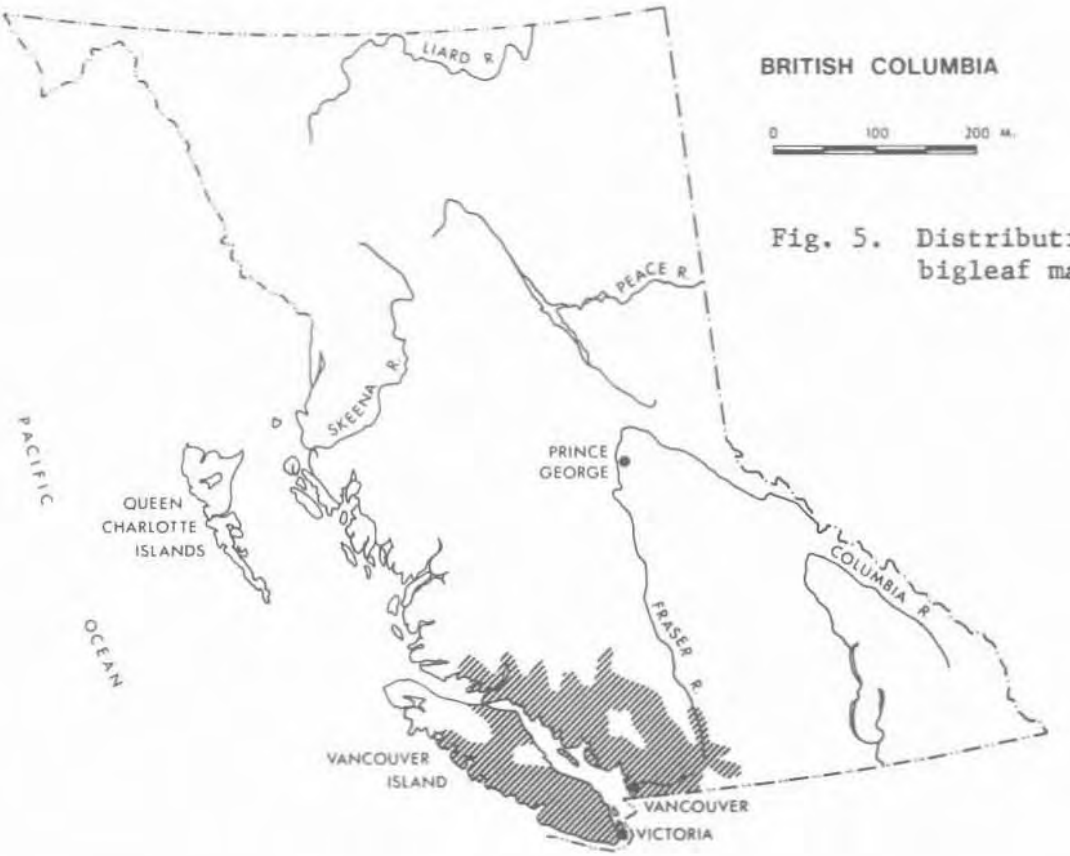


Fig. 5. Distribution of bigleaf maple

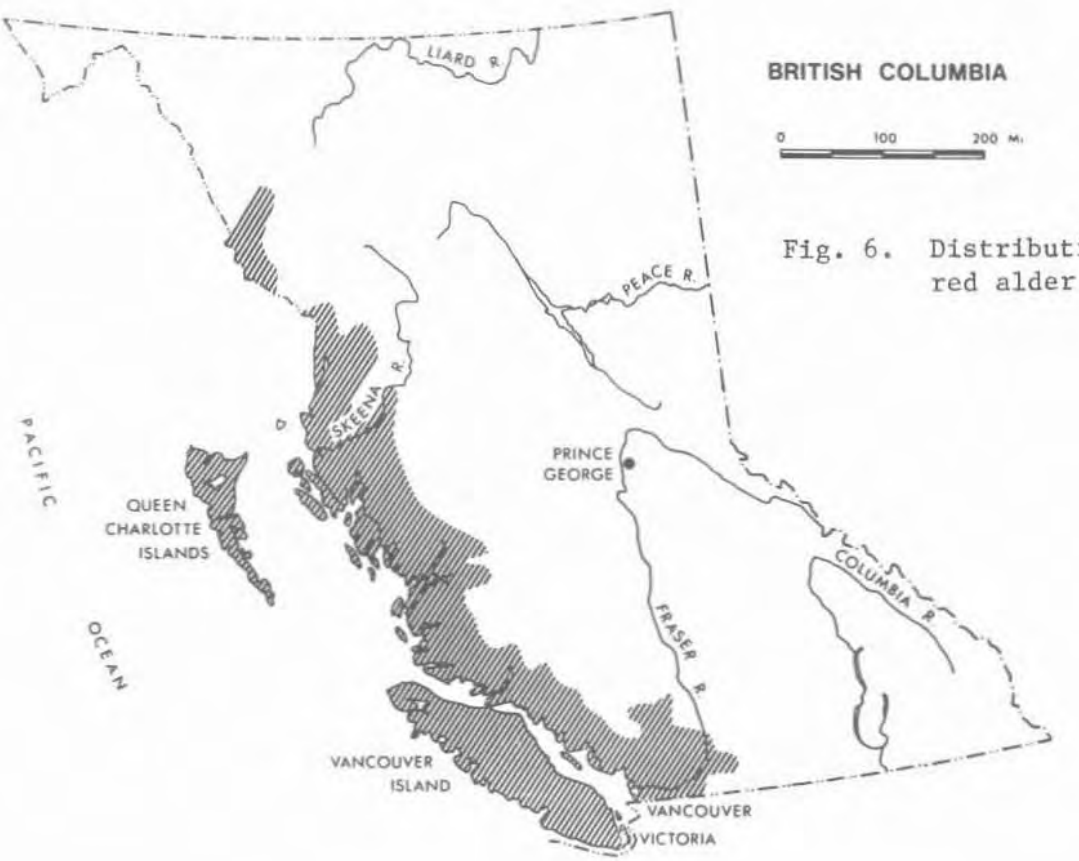


Fig. 6. Distribution of red alder

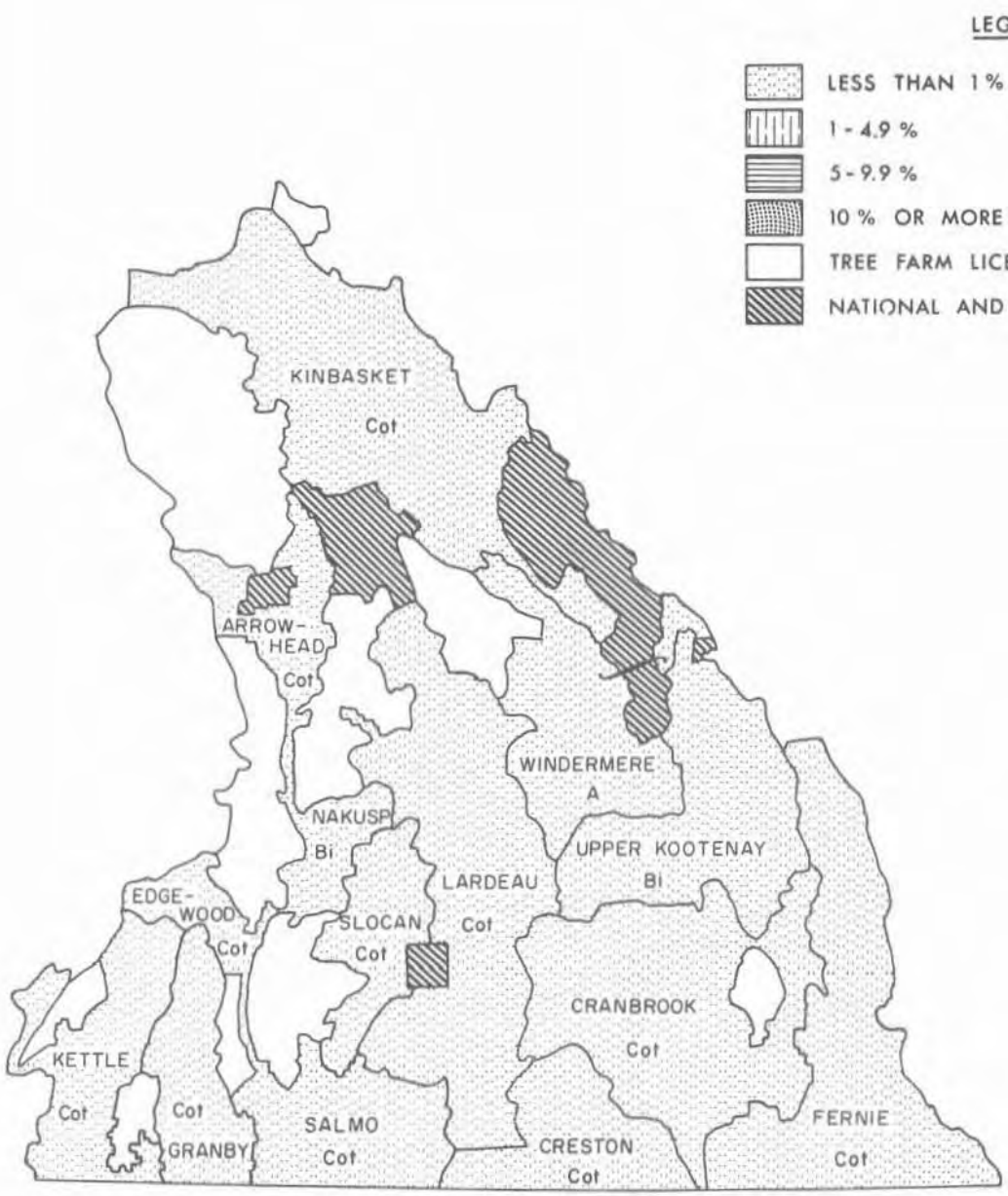


Fig. 7. Proportion of hardwood species in mature inventory, by P.S.Y.U., Nelson Forest District

Fig. 8. Proportion of hardwood species in mature inventory, by P.S.Y.U., Kamloops Forest District

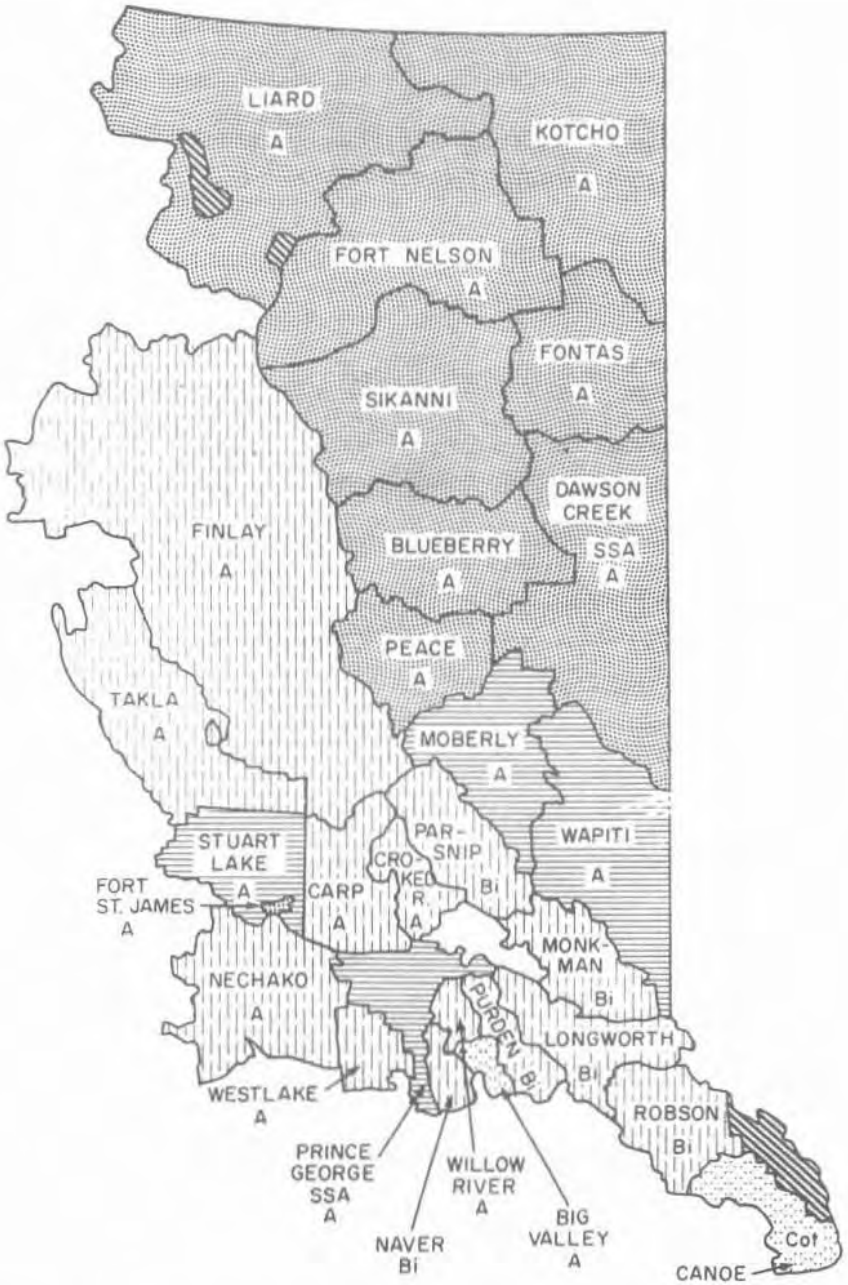
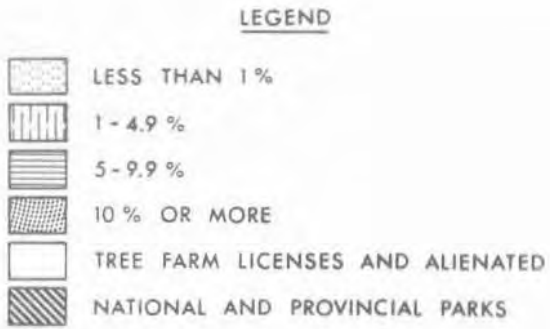


Fig. 9. Proportion of hardwood species in mature inventory, by P.S.Y.U., Prince George Forest District



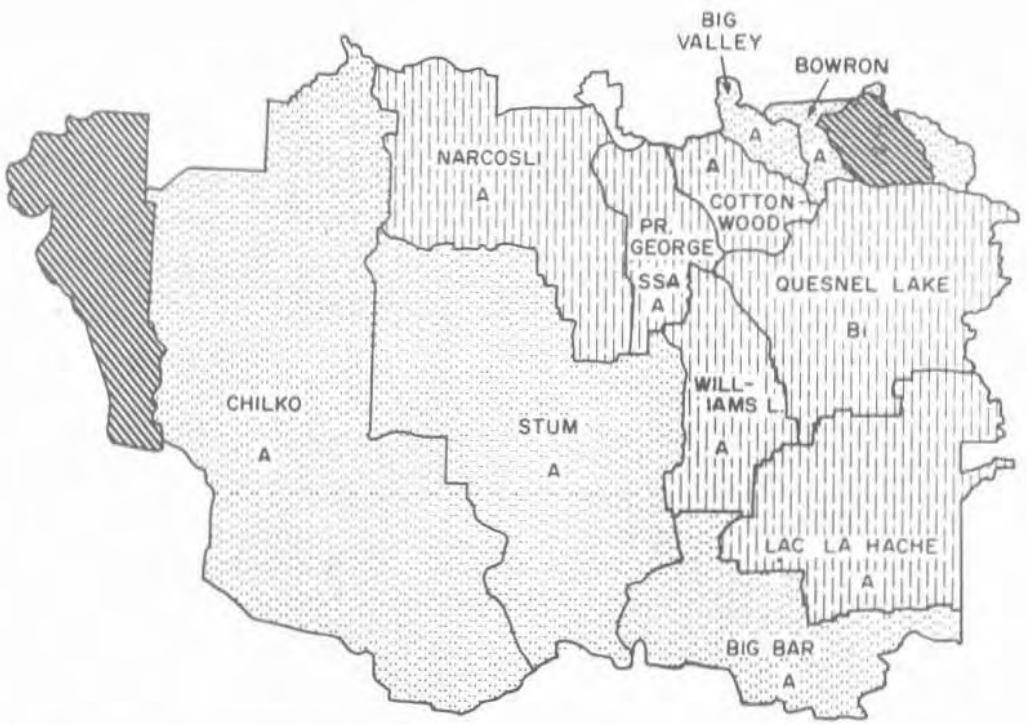


Fig. 10. Proportion of hardwood species in mature inventory, by P.S.Y.U., Cariboo Forest District

Fig. 11. Proportion of hardwood species in mature inventory, by P.S.Y.U., Prince Rupert Forest District

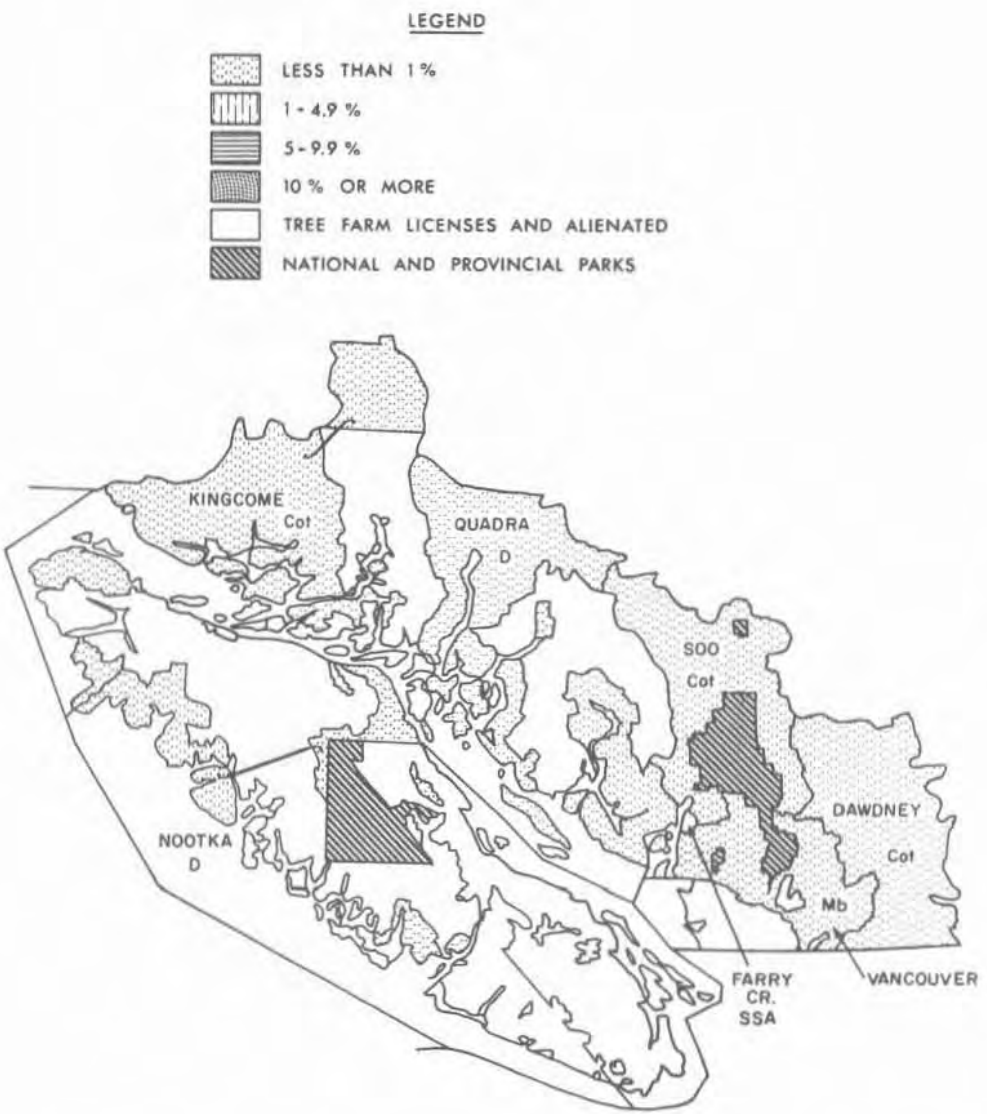


Fig. 12. Proportion of hardwood species in mature inventory, by P.S.Y.U., Vancouver Forest District

(57.2%); Fontas P.S.Y.U. (16.3%); Liard P.S.Y.U. (20.3%); Peace P.S.Y.U. (11.1%), and, Sikauni P.S.Y.U. (15.5%).

Another key consideration in the hardwood inventory is the degree of concentration, i.e., the proportion of inventory located in deciduous forest types. As the proportion of hardwoods in deciduous forest types increases, the operability of the stand for hardwoods also increases. Prime examples of units with relatively high concentration ratios are: Blueberry P.S.Y.U. (69%), Fort Nelson P.S.Y.U. (88%), and Dawson Creek S.S.A. (83%), all in the Prince George Forest District. In Prince Rupert, Skeena P.S.Y.U. (59%) and Stikine P.S.Y.U. (56%) show concentration in deciduous types.

Reviewing concentration by species, black cottonwood, white birch and the aspen species are generally found in deciduous types, whereas red alder and bigleaf maple are usually constituents of coniferous types. In terms of operability, the latter two present difficulties for a purely hardwood operator.

The quality of stands and trees is another factor to be considered in assessing the potential of hardwoods in British Columbia. Generally, British Columbia hardwoods are of low quality, with stands tending to have a high proportion of cull trees, and individual trees often of low quality (Figs. 13-15).

Decay and waste can run as high as 97% in cottonwood (B.C. Forest Service 1969). In other species, decay and waste are usually much lower. Figures 16 and 17 show typical hardwood logs as delivered to the sawmill. Note the relatively high quality of the birch which came from a young stand, and the poor quality and amount of decay in the cottonwood. Much of this material should not have been delivered to the mill but, because payment is on a firmwood basis (which is not necessarily appropriate to hardwoods at this time), it was brought into the mill yard.

Because hardwoods have not been utilized to any extent, the majority of stands are mature or overmature. These older stands contain a higher proportion of decay than would be expected in stands just reaching harvestable age under more intensive management. Thus, as these stands are harvested and regenerated, quality of the British Columbia hardwood resource will increase.

MANUFACTURE AND MARKETS

Although studies conducted in Canada and the United States[4/] have revealed a wide range of potential uses for British Columbia hardwoods (Table 1), the major one to date has been as factory lumber, although at least one company produces wood pulp from hardwoods.

British Columbia hardwoods compare favorably with those of competing species, in terms of physical characteristics, i.e., they have few disadvantages

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4/ Bailey 1973; Fuchs and Thompson 1967; Keays, Hatton, Bailey and Neilson 1974; Lamb 1967; Worthington, Ruth and Matson 1962.

Figure 13. Typical stand of trembling aspen (*P. tremuloides*) in Interior British Columbia

Figure 14. Typical stand of white birch (*B. papyrifera*) in Interior British Columbia

Figure 15. Typical stand of red alder (*A. rubra*) on Vancouver Island, British Columbia

Figure 16. Interior British Columbia black cottonwood (*D. trichocarpa*) logs.

Figure 17. White birch (*B. papyrifera*) logs.

Table 1. Product Potential for British Columbia Hardwoods

Product	Maple	Red Alder	Birch	Cottonwood	Aspen
Factory Lumber	x	x	x	x	x
Structural Lumber					x
Veneer	x	x	x	x	x
Pallet Stock	x	x	x	x	x
Crating Stock				x	x
Flooring	x		x		
Furniture Comp.	x	x	x	x	x
Turning Stock	x	x	x		
Toy Stock	x	x	x		
Decorative Panelling	x	x	x	x	x
Decorative Moldings	x	x	x	x	x
Charcoal	x	x	x		
Pulp				x	x

in important properties. For example, western white birch has greater bending and compression strength than eastern white birch or red maple.

In 1973, 20.4 million cubic feet (0.58 million cubic meters) of hardwoods were harvested in British Columbia, representing only 16.5% of allowable cut. In the Prince George Forest District, 3.8% of allowable cut was attained, while in the Vancouver Forest District, over 80% of allowable cut was harvested (Table 2) indicating that the major opportunity for increased utilization of British Columbia hardwoods is in the northern part of the province. The volume of hardwoods harvested in British Columbia has increased three-fold since 1960, the most dramatic increase being in Prince George Forest District.

Hardwood lumber manufacturers in British Columbia as elsewhere in Canada, usually operate small mills[5/]. While no exact data are available, typical mills have a daily capacity of about 15-20 thousand board feet (0.5-0.6 thousand cubic meters) per day (Figs. 18-20). The material is sold green and rough to a secondary manufacturer. This mill is typical of many Interior hardwood mills.

5/ A list of hardwood sawmills in British Columbia is in the Appendix.

Table 2. Harvest of Hardwoods in Relation to Annual Allowable Cut

District	Hardwood Volume	Annual Allowable Cut	Harvest - 1973	Harvest as Proportion of A.A.C.
	M.c.f.	M.c.f.	M.c.f.	%
Prince George	4,731,545	93,757	3,554	3.8
Kamloops	115,053	2,398	1,391	58.0
Nelson	52,252	1,121	616	55.0
Prince Rupert	1,655,572	15,591	10,176	65.3
Vancouver	462,900	5,629	4,508	80.1
Cariboo	321,921	4,786	124	2.6
British Columbia				16.5

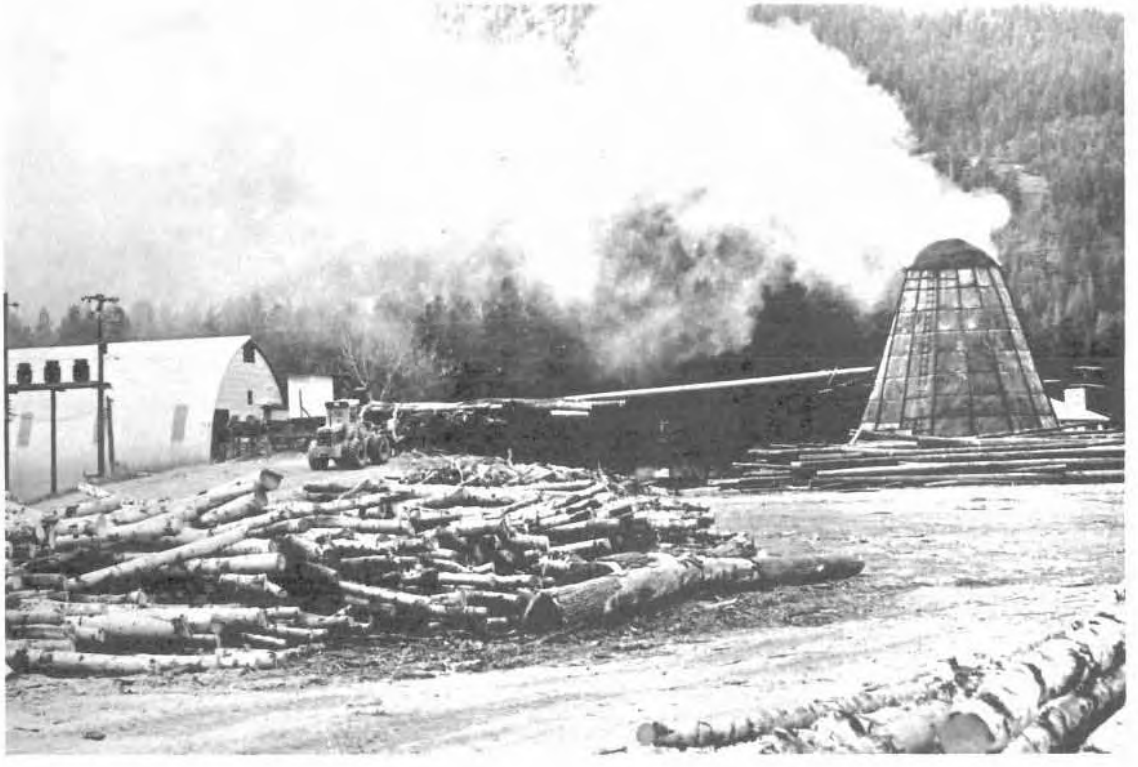

Figure 18. Mill of Barriere Birchwood, near Kamloops, typical of Interior British Columbia hardwood mills.

Figure 19. (Right) Sawing cottonwood cant.

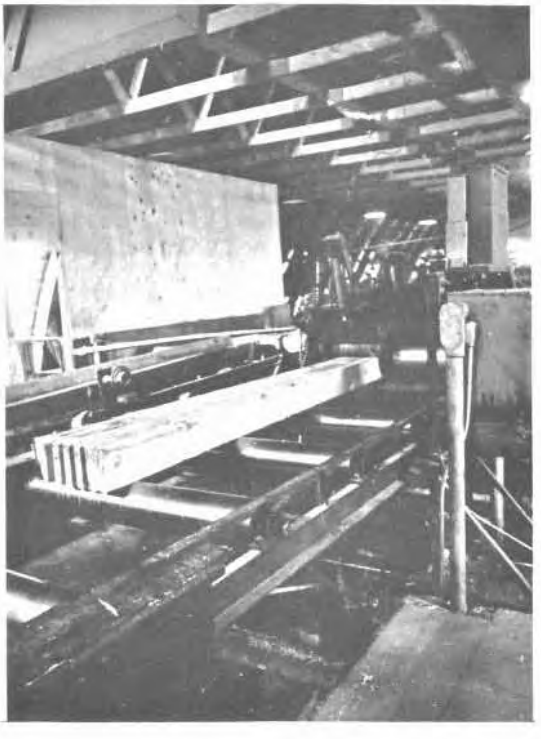

Figure 20. (Left) Breaking down cottonwood cant to 1-inch lumber.

Hardwood producers in British Columbia have four distinct and different markets:

United States
Local (B.C. & Western Alberta)
Eastern Canada
Non-North America

Each market presents unique constraints with respect to pricing, product specification and transportation and common to all is the problem of educating buyers to the properties of British Columbia hardwoods. In many cases, the organization of the industry is a problem. Small firms, operating over a widely dispersed area, can have difficulties in meeting contract commitments. Reliability of supply and quality is the key to growth in the British Columbia hardwood lumber and associated products industries.

A number of studies over the last decade have investigated various markets (principally North American) for hardwood products. Reports by the British Columbia Research Council (1966) and Massie (1966) concentrated on West Coast markets for hardwood furniture components, an important potential use of British Columbia hardwoods. Frazier, Weber and Mackenzie (1964) investigated specific markets in California. The California market produces 10% of the wooden furniture, but utilizes more than 16% of all pre-cut components used in the United States. In these studies, a number of problems were indicated, including transportation costs, meeting strict specifications and specified delivery dates. In the past, British Columbia producers have often failed to solve these problems. Markets for the primary product, factory grade lumber, do not exist in the western United States.

Dufresne, McLagan and Daigaunlt (1970) and Williams and Cox (1966) looked at a wider array of markets in the United States. Both reports concluded that the midwestern United States market should be a prime target for western hardwood producers. This area encompasses a large portion of the industrial heartland of the United States centering around Chicago, and uses large amounts of semi-manufactured and primary products, but has traditionally been ignored in favor of California markets. Recently, some British Columbia firms have been selling in this market, a natural for British Columbia hardwoods, since transportation rates are competitive with those from the United States Pacific Northwest region. Transportation rates between British Columbia and California are disadvantageous as compared with those between the PNW and California. Products most suited to the midwest market are those with low or nil tariffs, a prime example is precision furniture components (if quality specifications can be met).

In addition to furniture components, the midwest market can utilize cut-up lumber such as pre-cut wooden packaging components. Williams and Cox (1966) identify this market as the largest in the United States for this type of material.

In some ways, the local market appears to have the greatest potential. The opportunity to supply hardwood lumber, plywood and veneer to secondary manufacturing facilities in British Columbia appears to be especially good, as about 30% of these firms purchase from United States and eastern Canadian sources. Also, many of the purchases from local sources are eastern and imported

APPENDIX

Firms in British Columbia sawing hardwoods

A.J. Forest Products
Box 691
Squamish

Alwood Manufacturers Ltd.
#603-1200 W. Pender St.
Vancouver

Barriere Birchwood
Barriere

Bischoff, Ralph & Fred
Celista

Brownlee, W.C.
P.O. Box 756
New Westminster

Campbell River Hardwoods
Quinsam Rd.
Campbell River

Ernst, John
Quesnel

Gorman Brothers Box
Westbank

Indian Hardwoods Ltd.
Hwy #1
Cheam View

Mazur, D.
Box 39
Cranbrook

Northwest Imperial Hardwoods
890 W. Pender St.
Vancouver

O'Brien's Sawmill
Mahood Falls

Pacific Inland Resources
Smithers

Peace Wood Products
Box 29
Taylor

Phoenix Sawmill
Argenta

Prince George Hardwoods Ltd.
P.O. Box 1075
Prince George

Sandner Brothers Lumber Co. Ltd.
Christina Lake

Silberburger
Box 971
Vanderhoof

Thunder Bay Enterprises Ltd.
Thunder Bay Rd.
Powell River

Westcoast Hardwood Ltd.
1. Cassidy P.O.
2. 1211 East 6th Ave
   Vancouver
3. 23875 Fraser Way
   Langley
4. Rushins

Wynndel Box and Lumber Co.
Wynndel