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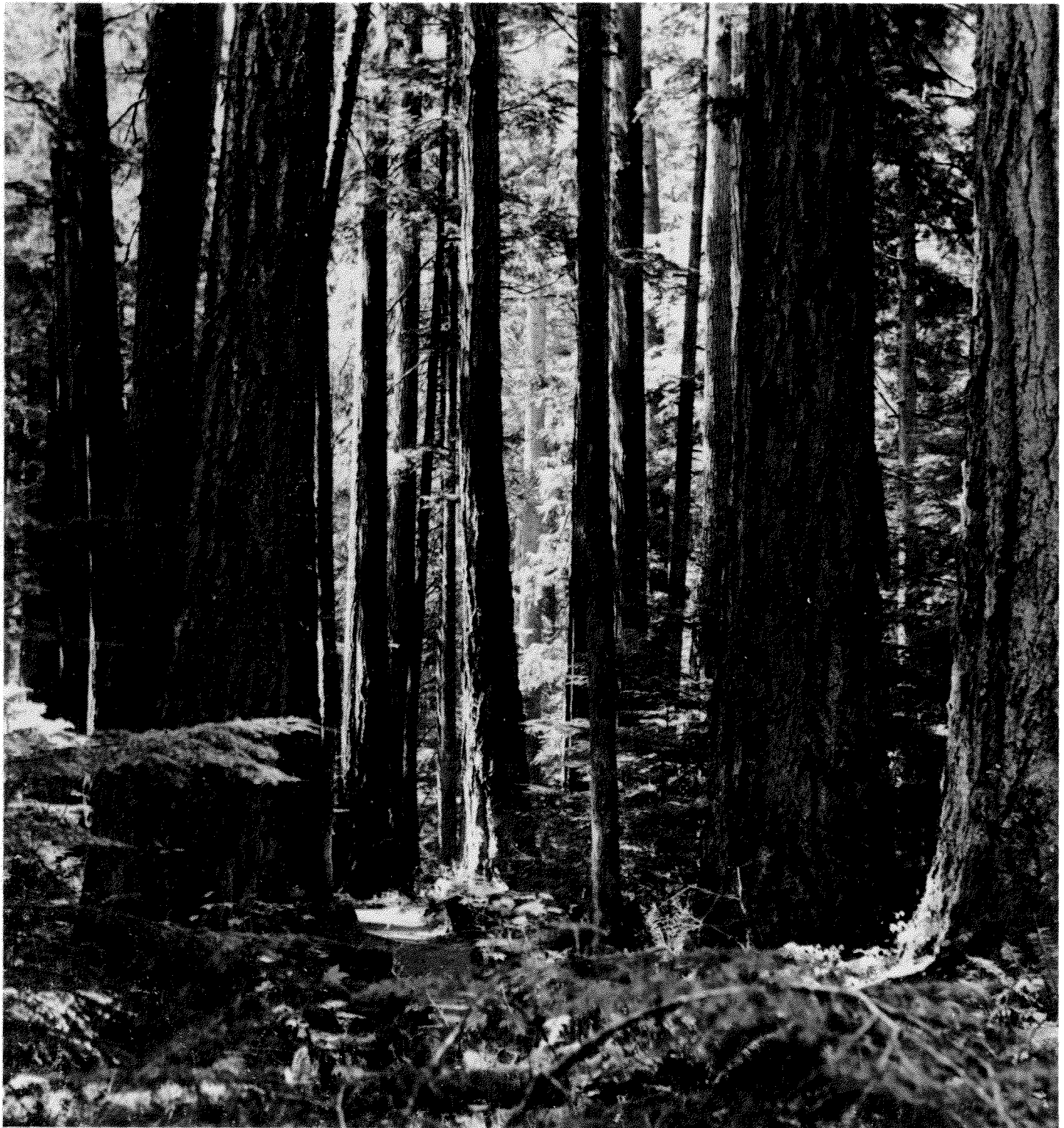
Environnement  
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# **Forest Resources and Utilization in Canada to the Year 2000**

by Glenn H. Manning  
and H. Rae Grinnell



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Points du Rapport en français

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## Preface

The Forest Economics Research Institute has accepted as one of its prime responsibilities a continuing program of research into the supply-demand balance for Canadian forest products. As a part of this responsibility, the Institute will periodically publish the results of its investigations.

This report, *Forest Resources and Utilization in Canada to the Year 2000*, is the first major report. It is in no way intended to be as complete, for instance, as the "Gordon Commission" report; but is intended as an interim report to update various forecasts made for the Resources for Tomorrow Conference and the Montebello National Forestry Conference.

Other reports which will appear in the future will deal with regional exports of forest products, wood-products consumption in residential construction, and an economic analysis of a lumber and plywood futures market. We believe that these, as well as the present report, will be quite useful in describing *national* supply-demand relationships for forest products. It should not be necessary to emphasize that this report and subsequent national reports will not be greatly useful to plan on a provincial or local basis except in the broadest sense.

An unfortunate problem evident in this report, and one common to much economic analysis, is the lag between research and publication. The problem is compounded by the lag between data collection and the time such data are made available for use by the analyst. This is reflected in the data, which are of somewhat earlier vintage than would be desired. The latest period for much of the data in this report is 1968, with some 1966 data. In future reports these figures will be updated, but due to the time element,

the data will always appear to be several years out of date.

Further, the estimates given for the years beyond 1980 should be viewed with extreme caution. Long-range forecasting is at best an imprecise art. As data improve, and the program of this Institute progresses, these forecasts will be revised and updated. In the interim, this report should provide a useful guide to the future.

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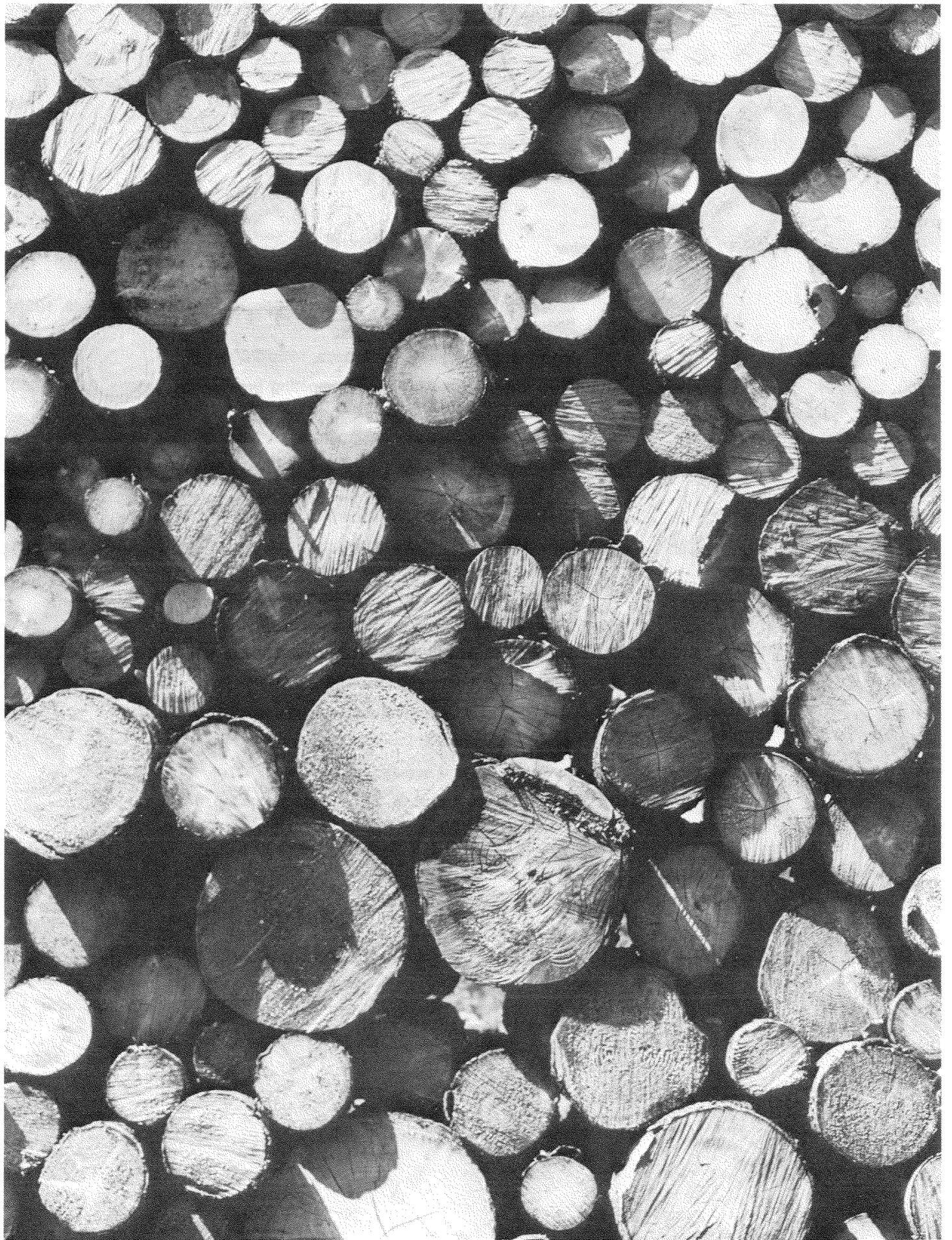
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## Main Points

This report presents estimates of the relation between the demand for Canada's forest products and the supply of timber available to meet this demand. Such reports are necessary periodically owing to changing economic conditions and improved information concerning trends in resource supply and product demand.

It is intended that the estimates presented here should replace several previous estimates of supply-demand balance, the most recent of which was presented to the National Forestry Conference in Montebello, Quebec, in 1966. Since then the economy of Canada has grown, export positions have been changed by the Kennedy Round, and new technology has been introduced into the forest industries. In addition, new forest inventories have been prepared by several provinces, and a new form of reporting for the National Forest Inventory has been adopted. All these changes allow better estimates of the supply of timber and of the future demand for roundwood and the forest products derived from it.

*Forest Resources and Utilization in Canada to the Year 2000* presents estimates of the future of the Canadian forest products economy, at 5-year intervals, from 1975 to the year 2000. The demand for individual products and product groups, both domestic and export, is presented. These estimates are then used to derive estimates of roundwood demand for the projection periods.

The report then describes the timber resource of Canada, quantitatively and qualitatively, and briefly discusses the factors influencing growth and mortality of this resource. Factors which might change, and therefore affect the utilization of this forest resource, are also discussed.

## Points du Rapport

Les auteurs estiment les rapports qui existeront entre la disponibilité de bois canadien et la demande de produits forestiers de 1975 à 2000 (à tous les 5 ans durant cette période).

De telles informations sont sujettes à révision périodique vu les fluctuations de l'économie et l'amélioration des sources d'information sur les ressources disponibles et sur la demande de produits, et les estimations présentées ici doivent remplacer celles qui datent de la National Forestry Conference tenue en 1966 à Montebello. En effet depuis 1966 l'économie canadienne a progressé, la situation des exportations a subi l'influence du Kennedy Round et la technologie n'est plus la même dans l'industrie forestière. Plusieurs provinces ont en outre effectué de nouveaux inventaires forestiers et le National Forest Inventory présente ses données d'une manière différente. Ainsi nous avons pu obtenir de meilleures estimations sur le bois disponible, la demande future de bois rond et en grume et les produits forestiers y dérivés.

Ce livre fournit des informations raisonnées sur la demande future de produits spécifiques et de groupes de produits pour le marché domestique et le marché d'exportation. Ces estimations ont servi ensuite à préparer les estimations sur la demande de bois rond et en grume.

La seconde section décrit quantitativement et qualitativement les ressources canadiennes de bois et discute brièvement les facteurs qui influent sur la croissance et la mort de telle essence forestière. Elle traite aussi des facteurs qui peuvent changer donc affecter l'utilisation de telle espèce arborescente.

On ne peut en venir à des conclusions précises sur le solde entre les ressources disponibles et la demande de

Owing to a lack of information on volume growth in Canada's forests—a lack that is now being corrected—no detailed predictions can be made concerning the balance between timber supply and demand. It is possible, however, to draw general conclusions concerning the future of Canada's forests and forest industries to the year 2000.

1. The United States will remain Canada's most important market for forest products, while Japan will assume the number two position at present held by the United Kingdom.
2. The average annual increase in production of forest products will be 2.3%.
3. Production of newsprint will increase by 1.9% annually, while production of other papers and board will increase 3.7% a year.
4. Production of lumber will increase at 1.8% annually. Production of plywood will grow more rapidly, at 4.2% a year.
5. With these increases, the demand for roundwood will grow at an annual rate of 2.2%. Some of the increase in the demand for raw materials will be met by the use of wood residues in the pulp industry, which will grow at about 3% a year while increasing to about 16% of all the raw material used.
6. The present shift from a wood economy to a fiber economy will continue, though at a reduced rate, the fiber industries growing at 3.1% a year, while the wood industries grow at 2.0% annually.
7. 796 million acres of Canada are forested, of which 588 million acres are suitable for regular harvest, 191 million are not suitable for regular harvest, and 17 million are reserved.
8. Of the 588 million acres of forest land suitable for regular harvest, 371 million are Crown forest land allo-

cated to timber production, and 64 million acres are private forest land.

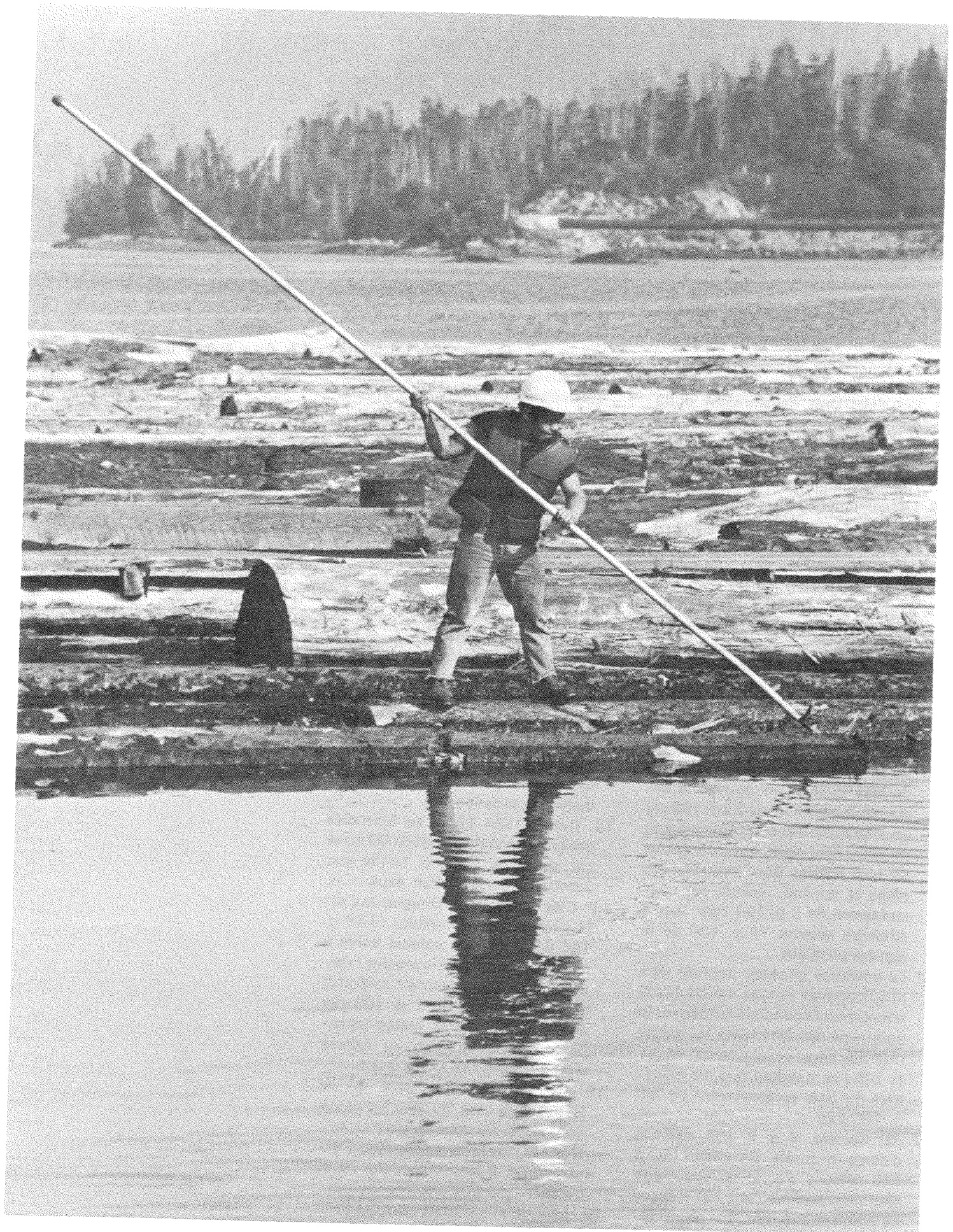
9. The inventoried volume of timber on lands allocated to timber production is 498 billion cubic feet; on land not allocated to timber production it is 132 billion cubic feet. Of this inventory, 80% is softwood.
10. In Canada, 54.3% of the inventoried land allocated to timber production is classed as young growth or immature.
11. A rise in roundwood cut from 3.973 billion cubic feet in 1968 to 7.62 billion cubic feet is expected to occur by 2000.
12. The average annual cut per acre during 1964-1968 was 1,850 cubic feet, depleting about 2 million acres annually. The projected cut for 2000 would require cutting slightly more than 4 million acres at present utilization standards.
13. The average number of acres burned in Canada during 1964-1968 was 803 thousand; the cutover area was 2,040 thousand acres.
14. Douglas-fir is the most heavily cut species, at 3.88% of *mature volume* annually; hemlock, spruce and balsam are about 1% a year. The demand projected for all species for 2000 would amount to slightly less than 2% depletion a year.
15. The two most heavily harvested provinces, New Brunswick and Nova Scotia, currently have a cutting cycle of 70 and 96 years, respectively.
16. The allowable cut on inventoried forest land is 10.731 billion cubic feet. Of this, 8.48 billion cubic feet is from land allocated to timber production.
17. Of the 779 million acres of non-reserved forest land in Canada, 270 million acres of forest land have not been inventoried.

18. Improved technology and an increase in the inventoried area of nonreserved forest land may increase the total allowable cut from 8.48 billion cubic feet to or beyond 10.731 billion cubic feet.
19. By the year 2000, on a national basis, depletion will not exceed the present allowable cut on inventoried land allocated to timber production (7.62 vs. 8.48 billion cubic feet).
20. Local and regional shortages may develop, as well as shortages of selected species, e.g., Douglas-fir.

produits, ceci à cause d'informations qui manquent sur la croissance en volume des forêts canadiennes. On est actuellement à corriger cette situation. Des conclusions générales sont par contre possibles, et les voici :

1. Les États-Unis demeureront notre marché d'exportation le plus important tandis que le Japon prendra la deuxième position, supplantant la Grande-Bretagne.
2. Le taux moyen annuel d'augmentation de la production des produits forestiers sera approximativement de 2.3 pour cent.
3. La production de papier à journal augmentera de 1.9 p. 100 par année tandis que la production des autres types de papier et du carton augmentera de 3.7 p. 100 annuellement.
4. La production de bois de sciage augmentera de 1.8 p. 100 par an, et celle de contreplaqué sera plus rapide, soit 4.2 pour cent.
5. Vu ces augmentations, il faudra plus de bois rond et en grume : la demande augmentera de 2.2 p. 100 par an. Une partie de cette demande sera satisfaite par l'usage accru de résidus de bois utilisés par l'industrie des pâtes et papiers, résidus qui augmenteront de 3 p. 100 l'an jusqu'à atteindre environ 16 p. 100 de la matière première.
6. La tendance générale actuelle vers une économie fondée sur les fibres remplaçant l'économie fondée sur le bois ira un peu diminuant, les industries des fibres progresseront de 3.1 p. 100 l'an pendant que les industries du bois progresseront de 2.0 p. 100 l'an.
7. Au Canada, il y a 796 millions d'acres de forêts. Ce chiffre inclut 588 millions d'acres en état d'être récoltées régulièrement, 191 millions ne pouvant être récoltées régulièrement et 17 millions réservées.
8. Parmi les dites 588 millions d'acres, 371 millions d'acres ont été concédées par la Couronne et 64 millions d'acres sont des forêts privées.
9. Le volume de bois dans les forêts concédées, d'après inventaire, est de 498 milliards de pieds cubes, et dans les forêts non concédées 132 milliards. D'après l'inventaire, les bois résineux constituent 80 p. 100 du volume total.
10. Au Canada, 54.3 p. 100 de la superficie des forêts inventoriées et concédées par la Couronne ne sont pas encore arrivées à maturité.
11. Le nombre de pieds cubes de bois rond ou en grume coupés s'élèvera en l'an 2000 à 7.62 milliards, de 3.973 milliards en 1968.
12. Durant la période de 1964 à 1968, la coupe annuelle moyenne à l'acre était 1350 pieds cubes, sur 2 millions d'acres chaque année. En l'an 2000, il faudra en couper annuellement un peu plus de 4 millions d'acres (estimation fondée sur les normes actuelles d'utilisation).
13. Durant 1964-1968, les incendies ont brûlé en moyenne 803,000 acres par année au Canada, tandis que 2,040,000 acres étaient exploitées.
14. C'est le Sapin de Douglas qui est le plus fortement exploité (3.88 p. 100 par année du volume arrivé à maturité), comparé à la pruche, l'épinette et le Sapin baumier exploités au rythme d'environ 1 p. 100 par année. En l'an 2000, toutes les espèces seront coupées au rythme d'un peu moins de 2 p. 100 l'an.
15. Au Nouveau-Brunswick et en Nouvelle-Écosse, les deux provinces dont les forêts sont les plus exploitées, les révolutions sont fixées actuellement à respectivement 70 et 96 ans.
16. La coupe maximale permise dans les forêts inventoriées est 10.731 milliards de pieds cubes. Ce chiffre inclut 8.48 milliards de pieds cubes dans les forêts de la Couronne concédées.
17. Au Canada, il y a 779 millions d'acres de forêts non réservées et ceci inclut 270 millions d'acres non inventoriées.
18. Si on améliorait la technologie et si on inventorierait toutes les forêts non réservées, la coupe maximale permise augmenterait de 8.48 milliards de pieds cubes à 10.731 milliards de pieds cubes ou plus.
19. En l'an 2000, pour tout le pays, la coupe de bois n'excédera pas la coupe maximale permise actuellement dans les concessions forestières (7.62 versus 8.48 milliards de pieds cubes).
20. Il se peut que des pénuries locales ou régionales se produisent, de même que des pénuries de certaines espèces telles que le Sapin de Douglas.





## Introduction

Canada contains 796,346 thousand acres of forest land which is 35% of Canada's total land area. Forest land suitable for regular harvest amounts to 588,293 thousand acres, or about 25% of the total land area. With this readily available resource, the forest industries have long been a major factor in Canada's economy. Canada cuts more than 8% of the total annual world production of industrial roundwood (F.A.O. 1966), a harvest exceeded only by the harvests of the United States and Russia.

In 1969, the forest industries provided 14.5% of the total value added in the economy (D.B.S., 1971a). In 1969, the forest industries also employed 3% of the labor force. The forest industries are very significant as a contributor to foreign trade: in 1969 they provided about 20% of the value of exports. The value of exports of the forest industries as a percentage of the total value of exports is declining, although the absolute value continues to rise. The Royal Commission on Canada's Economic Prospects (Davis *et al*, 1957) reported that forest industries contributed 35% to exports in 1954 and 1955.

Ninety percent of all forest products exports go to three countries—the United States (77%), the United Kingdom (10%), and Japan (3%). In terms of competition in world markets, our biggest rivals are the United States, Russia, and the Scandinavian countries.

Domestic consumption of forest products is also an important segment of demand. In 1966, Canada consumed about 30% of the paper produced domestically, as well as 40% of the lumber. With Canada's population projected to almost double between 1970 and 2000 (Brown, 1964), domestic consumption should continue to be a major segment of the demand for Canadian forest products.

In the face of the expected increase in the demand on Canada's forests, and the fixed or decreasing area of forest land available for timber management, it is essential to determine the magnitude of the future demand on Canada's forests. This information will give economic and forestry planners some basis for broad decisions as to the future course of forest management and as to the most efficient allocation of resources.





# The Demand for Timber

## Assumptions for Projecting Demand

Projections of domestic demand (apparent consumption)<sup>1</sup> and export demand for Canada's forest products were made separately. Domestic demand was projected by the method known as multiple linear regression, which relates demand to various indicator variables.

Export demand was projected by the relatively straight-forward method of trend extension, these values then being adjusted to take changing trends into account. Detailed discussion of these projections is available in Information Reports E-X-8 (Manning, 1970) and E-X-10 (Manning, 1971) of the Forest Economics Research Institute.

### Domestic Sector

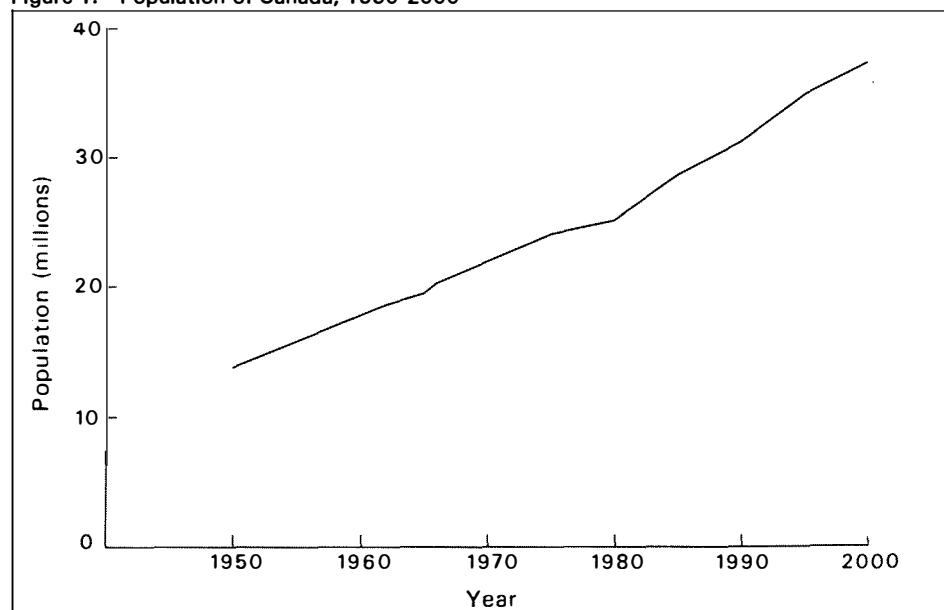
The basic assumption is that, other than the trends given, all other relationships will remain constant. This eliminates, for instance, changes in the trend of technology, and changes in

consumer tastes and preferences. Because of these assumptions, it must be emphasized that we are presenting projections of trends, not absolutes, and that these will not predict yearly random or cyclic fluctuations. Actual consumption will fluctuate around the trend line. In addition, the indicated trend is conditional on the attainment of the assumed conditions.

Detailed projections concerning the independent variables may be found in Table 1. Projections of the GNP and personal disposal income were derived from those developed by Brown (1964) for the Royal Commission on Health Services. The other projections are simple extensions of historic data. Historic data for the independent variables may be found in Table 18.

A very basic assumption concerns population. It is assumed that Canada's population will approximately double by the year 2000. In 1966 the population was about 20.23 million; by 2000, it will have increased to 37.50 million (Figure 1).

Figure 1. Population of Canada, 1950-2000



<sup>1</sup>In using apparent consumption as a surrogate for actual domestic demand, the implicit assumption is made that Canada could be entirely self-sufficient in forest products. This is obviously not possible; hence the impact on Canada's forest resources may be *slightly* overestimated.



Figure 2. Gross national product and personal disposable income for Canada, 1950-2000,

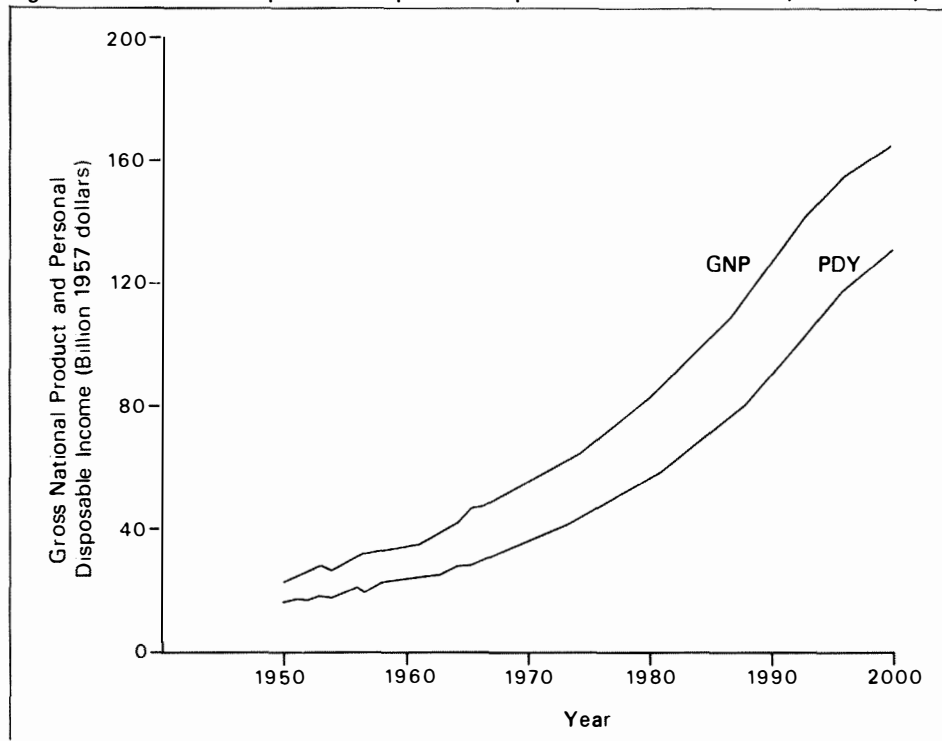
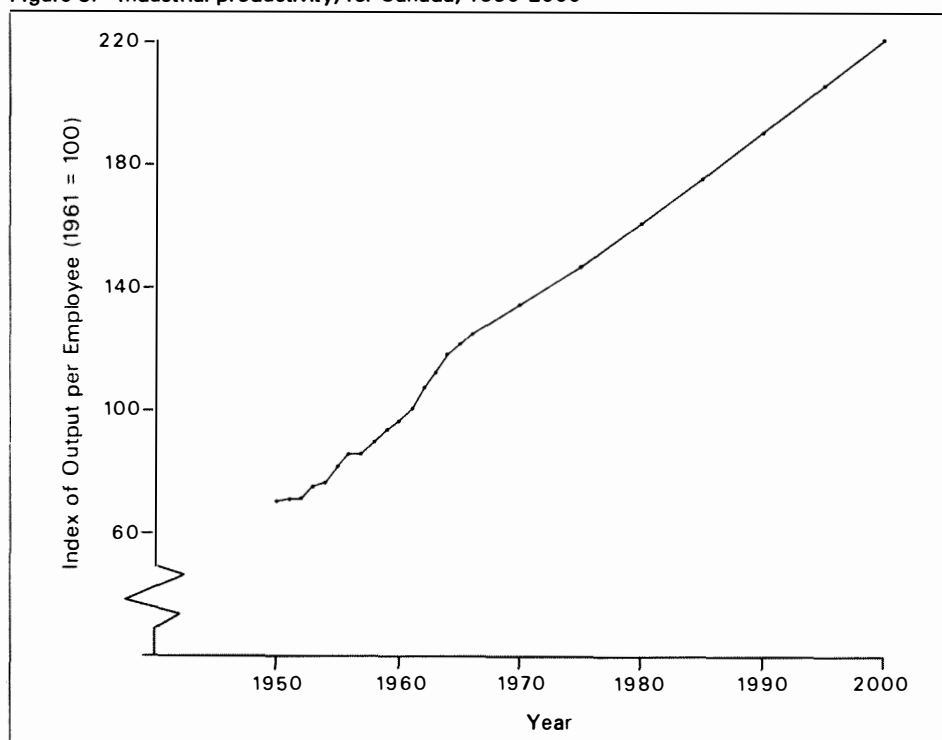


Figure 3. Industrial productivity, for Canada, 1950-2000



The Gross National Product in constant value dollars should approximately triple by 2000 (Brown, 1964) (Figure 2). This rests on the given assumption concerning population and a continuation in present trends of productivity. The GNP was 47.40 billion dollars in 1966. By 2000, it should have increased to 162 billion dollars. Personal disposable income and the index of output per employee (Figure 3) are expected to exhibit roughly the same trend relationships that have existed in the past.

Activity in the residential construction sector of the economy is another important indicator in the forestproducts industry. *Timber Trends and Prospects in Canada* (F.E.R.I., 1965) indicated that construction was the most important user of softwood lumber in Canada in 1960, consuming 95% of the lumber used. A similar relationship also exists for softwood plywood (about 75%). The use of shingles, hardwood flooring, and hardwood plywood is almost completely confined to housing.

Housing starts increased from 92.5 thousand in 1950 to 134.5 thousand in 1966—some 45%, or an annual growth rate of 2.3%. Of this housing, the proportion of apartments has increased from 14% to 46% during the same period. The absolute number of single-family dwellings started annually, however, has remained fairly constant (C.M.H.C., 1967). Construction of single-family dwellings, row houses and duplexes is a more important outlet for forest products than is apartment construction.

The Report of the Task Force on Housing and Urban Development (D. O.T., 1969) recommended that one million new dwelling units (of all types) be constructed by 1974 to meet the needs of replacement and a



growing population. This average annual rate would thus be 200 thousand units. The present study estimates that by 1975 Canada will exceed this number by 20 thousand units; by 2000, Canada will be constructing 310 thousand units annually.

The present trends in technological change are expected to continue. For

example, paper and board products are steadily substituting for other wood based products. Cardboard cartons and kraft sacks have almost entirely captured the box and bag market. Paper is now replacing tinplate in the "tin-can" market. Recent research has developed economical disposable paper clothing, bedding, and other cloth substitutes. A widespread movement by Canadians to prepackaged convenience foods and other prepackaged goods is expected to continue. It is for these reasons and others that recent trends in the consumption of paper and board show a steady increase.

The role of substitutes in the construction industries is largely unknown and uncontrollable. In residential construction, for instance, the use of aluminum siding instead of wooden clapboards has risen rapidly. The lumber industry has fought back with vinyl film coverings for wooden siding, prepainting and other changes. Strong, lightweight steel studs are being developed which can be sold more cheaply than wood. Mineralized asphalt roofing has largely captured the shingle market, though wooden shin-

gles are staging an architectural comeback. More important yet as an unknown quantity is the effect of future changes in federal, provincial and municipal building codes. Enforced substitution of nonforest products for many lumber and plywood products is not completely out of the question.

The result of these assumptions concerning technological change is that the relative prices of forest products may be expected to continue their present trend (Figure 4). This presupposes, furthermore, that there is no shortage of raw materials.

### Export Sector

The basic assumption on which projections of export trade in forest products are made is that historic trends will continue. In some cases, this assumption is relaxed to allow for current trends not reflected in long-term historic trends.

Two of the major factors affecting trends in foreign trade are comparative production costs and tariffs. The first largely affects competition with other producing countries; the latter affects entry to purchasing markets. Compa-

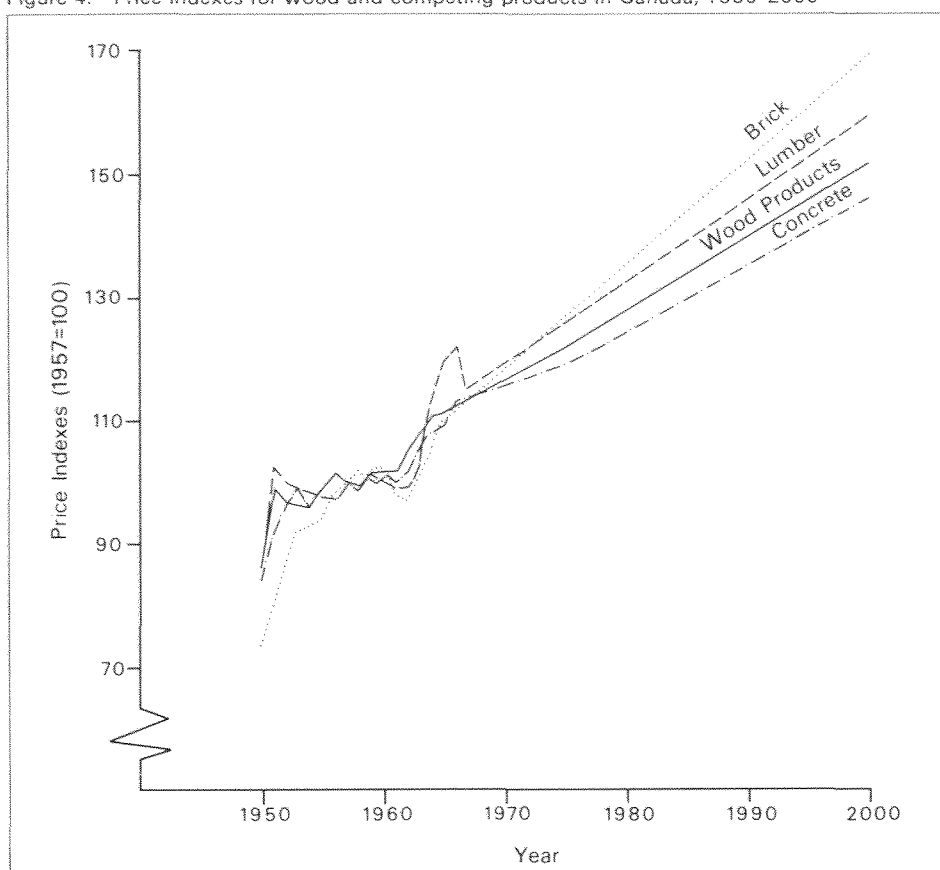
TABLE 1. PROJECTIONS OF CANADIAN ECONOMIC INDICATORS

Year	Population <sup>a</sup>	Gross National Product <sup>a</sup>	Personal Disposable Income <sup>a</sup>	Gross National Product <sup>a</sup> Per Capita	Personal Disposable Income <sup>a</sup> Per Capita	New Housing Starts <sup>b</sup>	Price Index Wood Products <sup>b</sup>	Price Index Lumber <sup>b</sup>	Price Index Brick & Clay Products <sup>b</sup>	Price Index Cement Products <sup>b</sup>	Index of Output/Employee <sup>b</sup> in Mfg.
	million	Billion 1957 \$		1957 \$	1957 \$	thousand	1957 = 100	1957 = 100	1957 = 100	1957 = 100	1961 = 100
1975	24.0	66.0	45.0	2,750	1,975	220	122.0	125.6	126.3	118.8	144.9
1980	25.1	82.5	58.0	3,287	2,311	240	128.0	132.3	134.9	124.3	160.0
1985	28.7	102.0	71.0	3,554	2,474	259	134.0	139.1	143.6	129.8	175.2
1990	31.5	125.5	90.0	3,984	2,857	276	140.0	145.8	152.3	135.3	190.4
1995	34.8	147.5	113.0	4,239	3,247	294	146.0	152.6	161.0	140.7	205.6
2000	37.5	162.0	129.5	4,320	3,453	310	152.0	159.4	169.7	146.2	220.7

<sup>a</sup>Adapted from: Brown (1964).

<sup>b</sup>Derived by simple trend extension from 1950-1966 data. This underlying data is to be found in Table 18, Appendix.

Figure 4. Price indexes for wood and competing products in Canada, 1950-2000



relative production costs in Canada's case are important in relation to Scandinavia, Russia, and the United States. Tariffs affect relations primarily with the United States, Japan, and the United Kingdom.

#### Scandinavian<sup>2</sup> Production Costs

The Scandinavian countries are among the world's largest producers of forest products. In 1968 they manufactured more than 17 million tons of woodpulp, of which more than 7 million tons were exported (C.P.P.A., 1969). Their production and exports of woodpulp generally exceed Canada's, but in the case of their newsprint, the reverse is true.

Manufacturing costs, labor productivity and timber inventory are prime determinants of Scandinavia's relative position in the world market. Labor productivity in harvesting (which is low compared with Canada's labor productivity) has a great effect on Scandinavian wood costs. In Finland, for example, 11 man-hours were required to harvest one cunit of wood in 1968 as compared with 2.2 man-hours in western Canada (R. A. Daly and Co., 1969). Productivity is improving rapidly, however. Total wood costs for newsprint are lowest in western Canada, which is followed by the southern United States, eastern Canada, Finland, and Sweden. Manufacturing costs were lowest in Finland<sup>3</sup> in 1968, followed by those of western Canada, the southern United States, eastern Canada, and Sweden. In kraft pulp, western Canada has the lowest manufacturing costs. In the case of plywood, Scandinavian production

<sup>2</sup>Pertaining to Sweden, Finland, and Norway.

<sup>3</sup>Largely owing to a 17% devaluation of the Finnish mark (R.A. Daly and Co., 1969).

costs seem quite high, with \$126 (U.S.) per cubic meter in Finland quoted by one source (L.R.O., 1967). The FOB export price was listed at only \$131 (U.S.) per cubic meter. Finland is the world's largest plywood exporter but seems to compete mainly on the basis of manufacturing custom sizes, 35% of all production being of nonstandard sizes.

#### Russian Production Costs

Because Russia has a regulated economy, discussion of production costs is not generally meaningful. It is recognized, though, that production costs, at least in logging, are high, and labor productivity low (Ekstrom, 1970). The forest industries, however, are rapidly becoming more mechanized, and the productivity of labor has more than doubled since 1950 (Keays, 1969).

The Russians have aggressively pursued a policy of capturing world markets, and have been greatly influenced by consideration of their balance of payments situation. Trade decisions in Russia are not greatly affected by internal costs or prices. Exports are generally made with two main objectives, the first being to obtain needed foreign exchange, and the second being to provide goods in exchange for foreign merchandise (bilateral agreements) (Algvere, 1966). The aim is to reduce the need to import in the future as Soviet industries expand. Export emphasis will probably shift from rough forest products to more manufactured products such as paper and plywood as industrial development occurs and as domestic markets are satisfied. The current emphasis on the export of roundwood may then be expected to decrease (Algvere, 1966).

#### United States Production Costs

R. A. Daly and Co. (1969) have indicated that production costs, at least in the southern United States, compare favorably with those in Canada. Some potential exports from the United States in the latter part of the century may be hampered by a shortage of roundwood. The United States Forest Service foresees a deficit position in saw timber by 1990, but pulpwood supply is deemed adequate for foreseeable needs (U.S.F.S., 1965). The same study foresees increased exports of wood pulp and some grades of paper. Owing to the expected deficit in saw timber, it is unlikely, however, that the United States will provide much competition in the sawnwood or panel-products market, except perhaps from Alaska. In all products, it seems likely that the United States will compete with Canada mainly in Japan.

#### Tariffs

The major factor in tariffs, which has recently affected the export market for forest products and will affect it more in the future, is the Kennedy Round agreements. These agreements, obtained in 1967, benefit the Canadian export trade in wood products strongly. The net effect of tariff concessions gained and granted is \$388 million in favor of Canada (R. A. Daly and Co., 1969). The net effect in favor of Canada in Canada/United States trade is \$340 million, and in Canada/Europe-Japan trade it is \$48 million.

*United States*—The following specific concessions were obtained from the United States (Fitzpatrick, 1968):

- (a) All Canadian lumber, whether softwood or hardwood, will move into the United States on a free-entry basis when the

Kennedy Round results are fully implemented.

- (b) Other forest products from which duties were eliminated include those covered by a building board tariff item, pulpboard and paperboard, and hanging paper, and five items for building papers, together totalling \$3.2 million in 1966.
- (c) Manufacture of wood including such products as wooden doors, prefabricated wooden buildings, furniture parts, birch plywood, particle board, and wooden building components, on which the duty ranged from 15% to 20%, were reduced to 7½%—10%.
- (d) Tariffs on maple and birch veneers, which were 8%, were reduced to 4%.
- (e) United States tariffs on paper and paper products were reduced by 50% across the board. Pulp and newsprint were already duty-free. The most important trade item in this category is uncoated printing paper on which the duty falls from 6.2% to 3%. Typical reductions on other items are from 8.5% to 4% on kraft wrapping paper and from 14.4% to 7.2% on coated printing paper.

*United Kingdom*—About 95% of Canadian exports to the United Kingdom enter free of duty. The terms of entry for these products were not changed by the Kennedy Round. The United Kingdom made reductions in import duties on softwood pulpwood (from 25% to 20%); rough and dressed softwood lumber (which becomes duty free); plywood (from 10% to 5%); kraft wrapping paper (from 13.33% to 10%); liner board (from 12% to

TABLE 2. DEMAND AND SUPPLY BALANCE FOR WOOD AND WOOD PRODUCTS IN JAPAN, 1965-2015

Year	Total Demand	Production	Imports	Self-sufficiency Rate
million cubic feet — roundwood equivalent				
1965	2,492	1,780	712	71%
1966	2,716	1,831	885	67%
1967	2,960	1,801	1,159	61%
1968	3,078	1,810	1,268	59%
1975	3,533	2,494	1,039	71%
1985	4,240	3,180	1,060	76%
1995	4,805	3,957	848	82%
2005	5,159	4,487	672	87%
2015	5,159	4,664	495	90%

Note: The Japanese General Countermeasure-Taking Conference for Forest Resources has suggested that the Japanese Forestry Agency should revise the figures for 1975 as follows:

Demand	3,533
Production	2,121
Imports	1,412

Sources: 1965-68—Japan Lumber Journal, 9(8), April 30, 1968, and 1975-2015—Japan Lumber Journal 7(6), March 25, 1966, from R. Cooper, Economist's view of Japanese log trade. New Zealand Timber Journal, 1 February, 1969.

TABLE 3. PROJECTED EXPORTS OF WOOD PULP, BY COUNTRY OF DESTINATION, FROM CANADA, 1975-2000

Year	United States	United Kingdom	Japan	Other Countries	Total
thousand tons					
1975	3,410	460	1,015	733	5,618
1980	3,845	530	1,645	871	6,891
1985	4,265	590	2,180	1,014	8,049
1990	4,690	660	2,550	1,158	9,058
1995	5,120	730	2,875	1,301	10,026
2000	5,545	795	3,855	1,444	11,639

TABLE 4. PROJECTED EXPORTS OF NEWSPRINT, BY COUNTRY OF DESTINATION, FROM CANADA, 1975-2000

Year	United States	United Kingdom	Japan	Other Countries	Total
thousand tons					
1975	6,620	675	520	900	8,715
1980	7,030	735	950	1,030	9,745
1985	7,440	790	1,350	1,165	10,745
1990	7,855	835	1,710	1,300	11,700
1995	8,265	875	2,030	1,430	12,600
2000	8,675	915	2,320	1,560	13,470

10%); groundwood printing paper (from 16.67% to 15%); writing and reproduction paper (from 16.67% to 15%); and corrugated container board (from 12.50%—20% to 10%—18%). British entry into the European Economic Community (EEC) could change Canada's favored-nation status and again increase tariffs.

*Japan*—Commodities affected by major Japanese tariff reductions on Canadian forest products include newsprint and plywood (both sides of coniferous species). Reductions on newsprint were from 7.5% to 5.5%. Reductions on plywood were from 20% to 15%.

#### Other Assumptions

*United States*—Basic assumptions concerning the economy of the United States show a population of 300 million by 2000 (Hair, 1970), and a GNP of \$2,200 billion (R.F.F., 1962), of which personal disposable income should be approximately \$1,750 billion. If housing starts continue on historic trends, residential starts will be 2.8 million by 2000.

President Nixon, however, has called for an annual rate of 2.6 million over the next 10 years. Should steps be taken to implement his goal, the potential effect on building-materials imports would be enormous. The long-range effects of the current recession and high interest rates on forest-products imports from Canada are impossible to assess. The short-term effect, however, should be to slow down the rate of increase over the next few years.

*Japan*—Japan is at present the number three customer for Canada's exports of forest products but should advance to be number two by the turn of the century. The Japanese

economy is the third largest in the world. In the past 20 years, the national output of Japan has increased ten times, the annual growth rate being 11% (Bank of Nova Scotia, 1969). This growth has been rapidly accelerating. Annual growth was 9% (in real terms) in the 1950's, 10% in the early 60's, and 13%—14% over the past few years. (Abegglen, 1970).

Projections of Japan's growth rate vary from 11% to 12.4% for 1975. A conservative estimate of the GNP would be \$350 billion in 1975 at the 11% growth rate (Bank of Nova Scotia, 1969). If this growth rate continues, a GNP of more than \$4,000 billion would be possible in 2000, although such a level is highly improbable.

In 1969, the Japanese population stood at 102.5 million. The Japanese Ministry of Welfare projects a population of only 118.5 million by 1990. By 2000, population should be about 125 million.

The rapid growth rate of Japan's economy and the relatively slow growth of its population have caused a rapid growth in per capita income. The growth of personal income has caused pressure for more consumer goods and better housing. It also has another effect on Japan's rapid growth, as personal savings exceed 20% of the GNP, allowing capital formation to exceed 30% of the GNP (Abegglen, 1970).

The growth of consumer and housing demands has been reflected in Canada's rising exports of forest products to Japan over the past 5 years. This rapid growth is expected to continue. For example, Boston Consulting Group, Inc. (1969) cites the Japanese government as calling for construction of 7.8 million new residential units by 1972. By 1985, 15.8 million new

units should be provided, and 11.2 million sub-standard houses renewed.

The Japanese timber economy has long been dependent on imports to meet the demand for forest products. Japan in 1966 imported 885 million cubic feet (roundwood equivalent) of forest products, or 33% of its total domestic demand. Table 2 details past and future trends in import requirements for forest products in Japan. Japan prefers to import goods in the least manufactured stage possible. This holds true in forest products, and thus preferred imports are and have been logs and bolts, pulpchips and wood pulp. A move to control exports of logs and pulpwood from the United States and Canada has resulted in larger imports of lumber, paper, and pulp.

In the area of crude materials, Alaska may be Canada's chief competitor in the future. The Japanese market is essentially Alaska's only outlet for forest products, and it is likely that the Alaskans will seek to control this market (Massie, 1968).

*United Kingdom*—The United Kingdom is at present Canada's second most important market for forest products. It is relatively stable, however, and will be surpassed by Japan by the turn of the century. The Scandinavian countries are the United Kingdom's traditional suppliers of forest products. In 1969, for example, Sweden exported about 550 thousands tons of paper and board and 700 thousand tons of pulp to the United Kingdom (S.P.P.A., 1970). Russia is also testing the United Kingdom market and may become an important influence.

Lumber, veneer and plywood, wood pulp and newsprint are Canada's major exports to the United Kingdom. On the basis of importance in world markets, however, the United Kingdom

is Canada's most important customer for veneer and plywood (40% of value of exports), wrapping paper (76%), and paperboard (71%)<sup>4</sup>.

The United Kingdom has long been dependent on imports to supply its forest-products requirements. Domestic production of roundwood meets about 8% of requirements (Hummel and Grayson, 1969). Grayson (1969) predicts total importation of forest products (roundwood equivalent) at 90% of total requirements in 1975 and 89% in 1980. This is based on an annual growth in consumption of 2.2% — 2.6%.

Total requirements are forecast to be 1,640—1,700 million cubic feet (roundwood equivalent) in 1975 and 1,825—1,935 million cubic feet in 1980. Imports are forecast to be 1,515—1,575 million cubic feet in 1975 and 1,670—1,780 million cubic feet in 1980.

*Other Countries*—Countries other than the United States, the United Kingdom, and Japan constitute relatively minor markets for Canadian forest products. Western European countries in aggregate in 1969 received only 6% of Canada's forest products on a value basis.<sup>5</sup>

Significant imports by countries other than the "big three" are lumber, pulpwood, newsprint, paperboard, and wood pulp. It is expected that the proportion of forest products exports to countries other than the United States, the United Kingdom, and Japan will remain low. The effect of increased industrialization of areas at present underdeveloped and growth of the forest products sectors of many of them may, in fact, cause a decline in the exports of forest products to them.

<sup>4</sup>Information from the Dominion Bureau of Statistics (D.B.S.) by special request.

<sup>5</sup>Information from D.B.S. by special request.

Figure 5. Destination of Canada's newsprint production, 1966, in percent

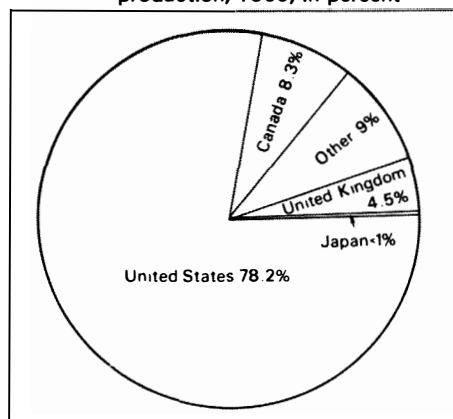


Figure 7. Destination of Canada's lumber production, 1966, in percent

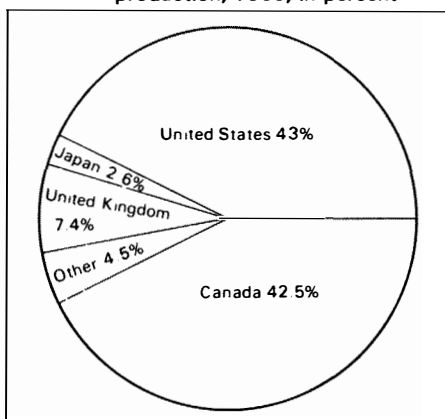


Figure 6. Destination of Canada's other paper and board production, 1966, in percent

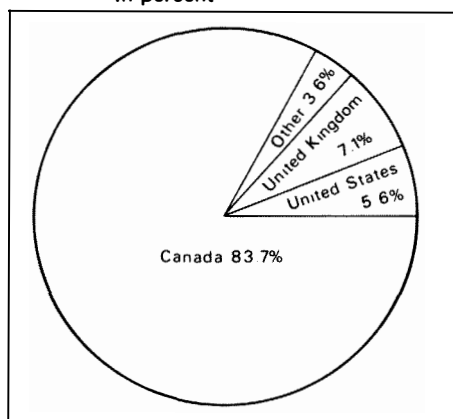


Figure 8. Destination of Canada's plywood and veneer production, 1966, in percent

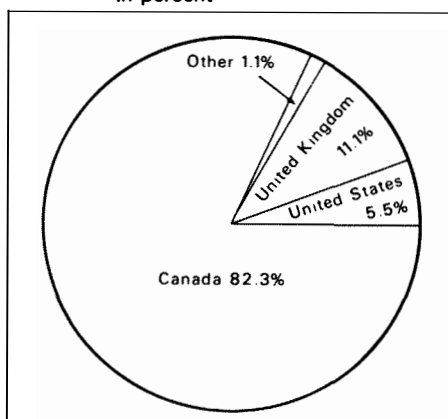
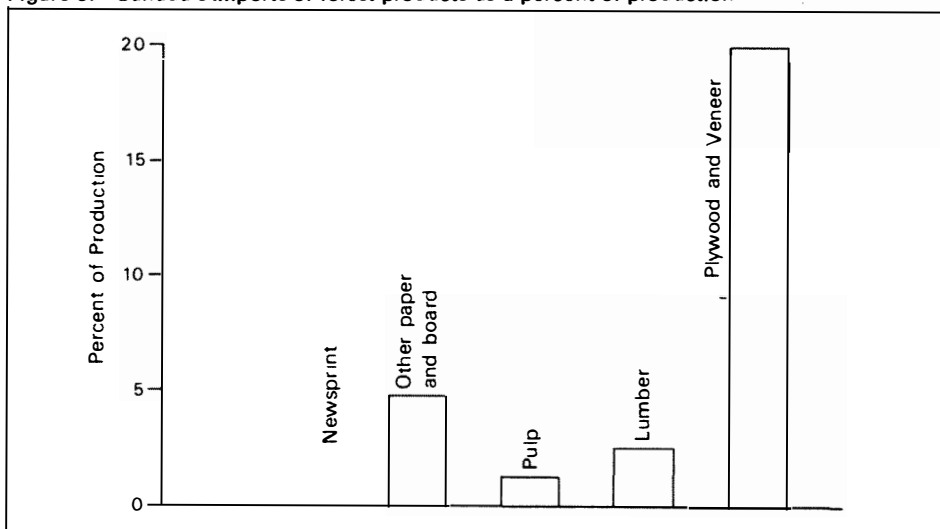


Figure 9. Canada's imports of forest products as a percent of production



## Projections

The production of forest products has increased steadily in Canada over the past few decades. In large part, this is due to Canada's favorable competitive position in the world forest-products market, which may be expected to continue.

Given the favorable climate in world trade, Canada's forest-products exports may be expected to double by the year 2000, at an annual increase of 2.3%. Domestic consumption will continue to be an important and growing market. Figures 5, 6, 7, and 8 outline the relative importance of domestic and export markets for major Canadian forest products as of 1966. Thus, while domestic markets are shown to be important for some products, export markets are overwhelmingly important in others.

Imports constitute a very minor part of Canada's consumption of forest products. In only one case, that of plywood and veneer, do imports constitute more than 5% of total Canadian production (Figure 9). This import consists generally of fine hardwood plywood and veneer, largely from Japan (luan) and the United States (walnut).

## Product Projections

### Wood Pulp Exports

**United States**—The United States is Canada's largest market for wood pulp, in 1968 having received 73% of total exports, or 3,225 thousand tons. Its pulp imports for that year were 3,494 thousand tons. The United States Forest Service in 1963 estimated the United States 1966 pulp import requirements at about 1,600 thousand tons (U.S.F.S., 1965), but the import total exceeded this markedly. They

also projected pulp import requirements for 2000 at 5,100 thousand tons, but a more realistic projection may be 7,500 thousand tons. Canada, as can be seen, dominates the United States pulp market, supplying 85% to 90% of the total. The remainder comes largely from Scandinavia.

Canada's pulp exports to the United States are expected to increase at about 1.7% annually until 1980 and at 2.7% thereafter. By 2000, its wood pulp exports to the same country are expected to be 5,545 thousand tons.

*Japan*—Japan's future imports of wood pulp are uncertain. In 1964, total pulp imports were 862 thousand tons, of which Canada supplied 410 thousand tons. Canadian pulp exports to Japan have increased rapidly in the past several years.

There is a slight chance, however, that Japanese imports of forest products will peak by 1985. Japanese experts have optimistically predicted 76% self-sufficiency in timber by 1985 (Table 2), but the effect on pulp will be uncertain, as Japan has historically preferred to import low-value products such as pulp and logs. It is possible that Japanese roundwood production will go into lumber and plywood.

It is expected, therefore, that by 1980 Japan will be the second largest importer of pulp from Canada, receiving 1,645 thousand tons, and that by 2000, its imports will total 3,855 thousand tons. The possible effect on these projections of Russia's growing pulp and paper industry in Siberia should not be underestimated. Also, the growth of pulp exports from Alaska may be expected. Were it not for these developments, exports to Japan could be much larger.

*United Kingdom*—Canada is the United Kingdom's second largest source

of wood pulp. In 1968 it contributed 316 thousand tons to an import total of 3,301 thousand tons. Canada is exceeded as a supplier by the Scandinavian countries at a ratio of almost 7 to 1. Because of the close physical proximity of the Scandinavian countries to the United Kingdom, this ratio will remain large.

The demand for imported wood pulp is tied directly to the demand for paper and board. More than 55% of the materials used in papermaking in the United Kingdom consist of imported pulp (Ray, 1965).

Several other factors may affect exports of wood pulp to the United Kingdom. Among these is the future performance of Russia, whose wood pulp exports to that country have been about 50 thousand tons annually. Also, the trend of the Scandinavian pulp and paper industry toward vertical integration may be of benefit to Canadian wood pulp exporters.

Canadian exports of wood pulp to the United Kingdom are expected to reach 530 thousand tons by 1980 and 795 thousand tons by 2000. This closely follows the trend of paper demand and paper imports.

*Other Countries*—Wood pulp exports to other countries stand second only to those of newsprint in importance. Europe, with its significant roundwood deficit absorbs about 75% of this wood pulp. Exports of wood pulp to other countries were 1,019 thousand tons in 1968. Owing to rising standards of living and larger wood deficits in Europe, wood pulp exports to other countries will rise to reach 1,444 thousand tons by 2000.

#### Newsprint Exports

*United States*—Exports of newsprint to the United States are forecast to

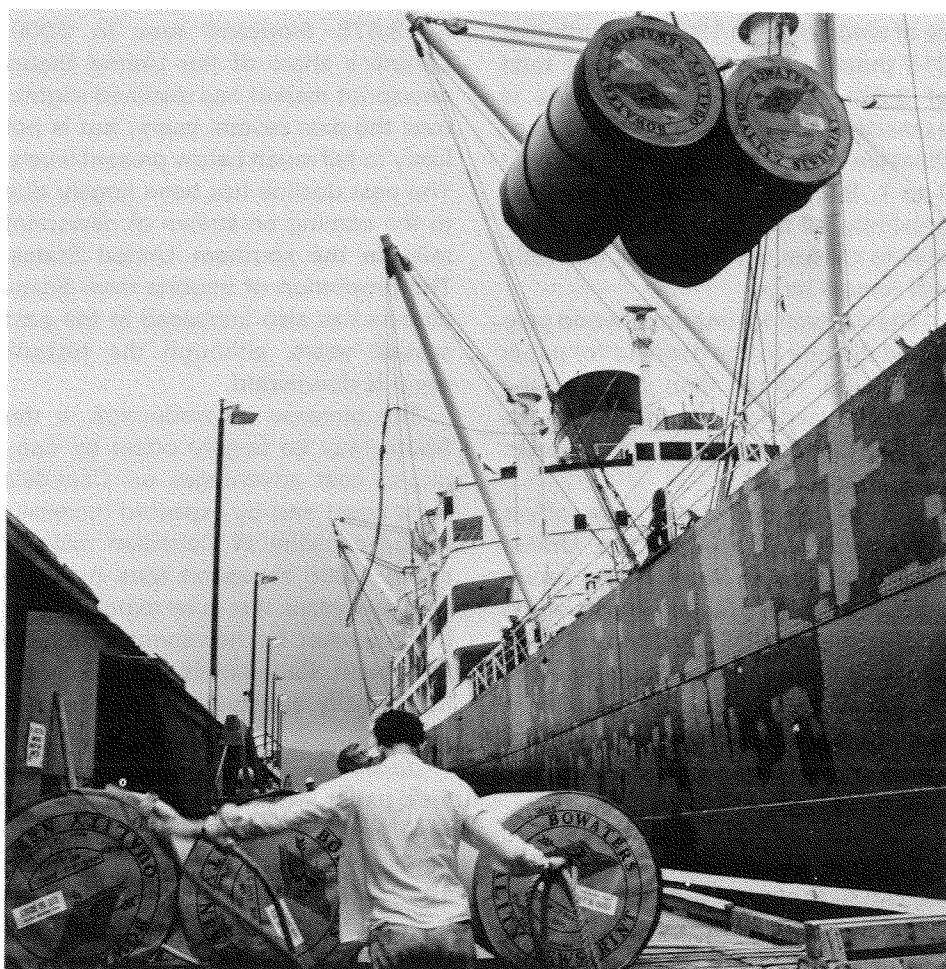
be 8,675 thousand tons in 2000. Canada's share of the United States newsprint market has declined slightly over the past several years; but is not likely to fall much below present levels. The past decline has been largely due to the coming on stream of newsprint mills in the southern United States. The proportion of imports from Scandinavia has also increased in the past several years, although the historic trend is downward.

The increase in production in the South may be largely offset by continued cost advantages on Canada's west coast and by expected increases in the capacity of Canadian mills of about 1,000 thousand tons over the next few years. It is to be expected that if the market for newsprint continues its growth, Canada will again increase its capacity substantially by the year 2000.

*Japan* — Japan imports relatively little paper, other than wastepaper for fiber requirements. Imports of new paper amounted to 145,000 tons in 1968. About 75% of these imports were composed of Canadian newsprint, which is preferred for its superior color-printing qualities (Butts, 1968). Demand for paper in Japan is expected to be 440 lb./capita in 2000 (Sundelin, 1970), which would give a total demand of 27.5 million tons. This may be a conservative figure.

Japan is the third largest individual market for Canada's forest products, but imports relatively little newsprint from Canada. The 111 thousand tons obtained from Canada in 1968, constituted 100% of Japan's newsprint imports. It is expected that newsprint exports to Japan will increase significantly, to 950 thousand tons in 1980 and 2,320 thousand tons by 2000. This increase may be due not so much to population and income increases





in Japan as to a shift of Japanese paper production to higher-value products.

These estimates could be overstated, as projections for the Japanese market are difficult. Some Japanese officials, however, have talked of total pulp and paper imports from Canada of 2,200 thousand tons by 1975.

**United Kingdom**—Newsprint is Canada's largest forest-product export to the United Kingdom. In 1968, Canada exported 438 thousand tons to that country, which consumed a total of 1,562 thousand tons of newsprint in 1968. Newsprint demand in the United Kingdom has grown at the rate of 5.5% annually since 1954 and is projected to reach 2,343 thousand tons by 1975 (Ray, 1965). It has been estimated that 62% of this will have to be imported.

It is believed that newsprint demand will not continue to increase at the annual rate of 5.5%. Some of this rapid increase was attributed to a nonrecurring "catch-up" in the 1950's of demand suppressed by wartime restrictions (Sundelin, 1970). It is likely that future increases in demand will be tied to increases in population, which are expected to average less than 4.5% annually. Total demand in 2000 would then approach 5,000 thousand tons of newsprint.

Canada's share of the United Kingdom's newsprint imports is forecast to be 735 thousand tons in 1980 and 915 thousand tons in 2000. Canada's share is thus seen to be declining.

**Other Countries**—Exports of newsprint to other countries are, in volume and value, more important than any other forest-products export to these countries. In 1968, these exports stood at 791 thousand tons. In the light of Canada's continued dominance of world newsprint markets, exports of

newsprint to other countries are expected to reach 1,560 thousand tons by 2000.

#### Domestic Consumption of Newsprint

Consumption of newsprint rose from 381 thousand tons in 1950 to 714 thousand tons in 1968, a total increase of 87%, 3.6% a year. It is projected to increase further to 1,875 thousand tons in 2000, thus increasing by 163%, or 2.8% a year. This is consistent with the expected rapid growth of urban Canada.

#### Exports of Other Paper and Board

*United States*—Exports to the United States of pulp and paper products other than newsprint and wood pulp are relatively minor. Exports of such products to the United States totaled only 207 thousand tons in 1968, and are expected to rise to only 309 thousand tons by 2000. The two largest components are printing paper and building boards, which are expected to amount to 190 thousand tons and 90 thousand tons, respectively, by 2000.

*Japan*—The import of paper other than newsprint by Japan is minor. Exports from Canada reflect this factor. It would be most optimistic to expect exports of printing paper to exceed 30 thousands tons, or of kraft wrapping paper to exceed 20 thousand tons by 2000.

*United Kingdom*—Paperboard is a significant forest-product export to the United Kingdom. Exports in 1968 were 174 thousand tons, and will reach 310 thousand tons by 1980 and 525 thousand tons by 2000. Ray(1965) projects a demand of 2,646 thousand tons for 1975 with about 25% imported. Canada will supply 255 thousand tons, or something less than

50% of imports. Exports of all other grades of paper and board to the United Kingdom will total only 107 thousand tons in 1980 and 173 thousand tons in 2000.

*Other Countries*—Exports of other papers and boards to other countries are relatively minor. These exports totaled only 141 thousand tons in 1968. By 2000, these exports will reach only 169 thousand tons.

#### Domestic Consumption of Other Paper and Board

*Printing Paper*—During 1950–1953, consumption of printing paper fluctuated. Between 1954 and 1968, however, consumption rose from 128 thousand tons to 262 thousand tons, 105%, or 5.3% a year. This trend is expected to continue at the same annual rate of increase with a consumption of 1,130 thousand tons forecast for 2000.

*Fine Paper*—Consumption of fine paper has generally exceeded that of printing paper. Consumption rose from 113 thousand tons in 1954 to 278 thousand tons in 1968, with an annual increase of 6.7%. Consumption is expected to increase to 1,136 thousand tons by 2000, with an average annual change of 4.5%.

*Tissue and Sanitary Paper*—Tissue and sanitary papers show a fairly rapid rise from 80 thousand tons in 1950 to 246 thousand tons in 1968, with an annual increase of 7.5%. The apparent consumption expected in 2000 is 1,304 thousand tons, the result of an annual increase of 5.2%.

*Wrapping Paper*—Consumption of wrapping paper rose slowly between 1950 and 1962, from 214 thousand tons to 300 thousand tons, or 2.7% a year. Between 1962 and 1968, consumption rose from 314 to 374 thou-

sand tons, or 3.5% a year. By 2000, consumption is expected to be at 1,053 thousand tons after an increase of 3.2% a year. This estimate may be conservative, given an expected increase in paper food packaging and increased use of convenience foods.

*Industrial Papers*—During 1950–1968, consumption has changed very little. It is expected that consumption of industrial papers will decrease from 101 thousand tons in 1968 to 38 thousand tons in 2000. The decrease may be attributed largely to the substitution of superior or less expensive goods or to a general lessening of the rate of increase in industrial productivity.

*Paperboard*—Consumption of paperboard doubled during 1950 to 1968. It is expected that from 1968 to 2000, consumption will rise from 1,596 thousand tons to 5,532 thousand tons for an annual increase of 3.7%. This increase, like that of wrapping paper, may be attributed largely to increases in "throw-away" packaging.

*Building Board*—In the period 1950–1968 the use of building board in Canada more than doubled, rising from 103 thousand to 305 thousand tons, at an annual increase of 6.1%. By 2000, the annual consumption of building boards will be 641 thousand tons, after an annual increase of 2.2%. This reduced rate of increase may be due to increased competition from other panel products.

#### Lumber Exports

*United States*—United States imports of lumber from Canada are expected to total 10,255 million board feet in 2000, of which 155 million will be hardwood. This is up from 5,555 million in 1968, having increased by 85%, or at an annual rate of 1.9%.

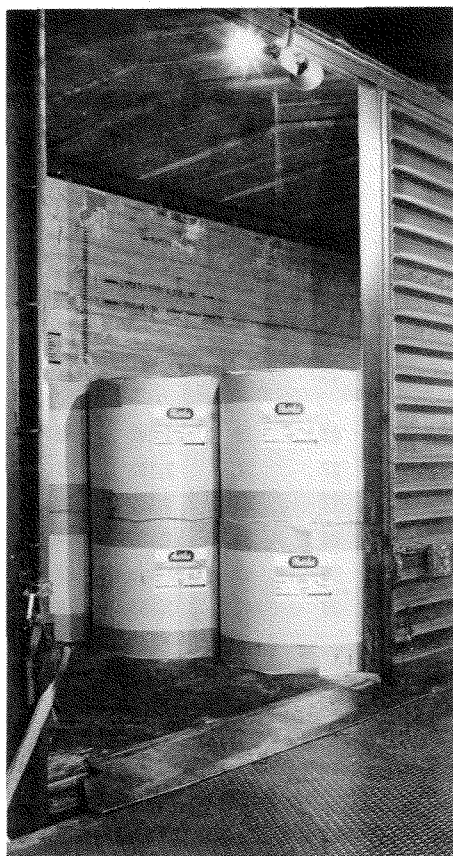
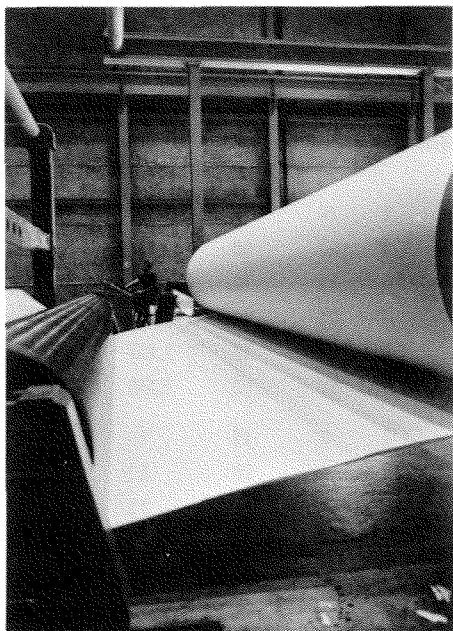
This projection may be affected by

Table 5. PROJECTIONS OF CANADA'S APPARENT DOMESTIC CONSUMPTION OF PAPER AND BOARD, 1975-2000

Year	Newsprint	Printing Paper	Fine Paper	Tissue and Sanitary Paper	Wrapping Paper	Industrial Paper	Paper-board	Building Board
thousand tons								
1975	830	371	404	385	492	103	2,153	381
1980	1,010	487	530	527	600	92	2,732	433
1985	1,222	604	679	668	727	86	3,417	485
1990	1,478	775	858	874	851	74	4,242	537
1995	1,718	982	1,026	1,125	952	57	5,014	589
2000	1,875	1,130	1,136	1,304	1,053	38	5,532	641

TABLE 6. PROJECTED EXPORTS OF OTHER PAPER AND BOARD FROM CANADA, BY COUNTRY OF DESTINATION, 1975-2000

Country	Year	Printing Paper	Fine Paper	Tissue and Sanitary Paper	Wrapping Paper	Paper-board	Building Board	Country Grand Total	Total 1975	Total 1980	Total 1985	Total 1990	Total 1995	Total 2000
thousand tons														
United States	1975	105	3	2	9	8	50	177						
	1980	130	3	2	9	7	60	211						
	1985	145	4	3	10	6	65	233						
	1990	160	4	3	11	6	75	259						
	1995	170	5	4	12	6	80	277						
	2000	190	6	4	13	6	90	309						
United Kingdom	1975	18	18	10	42	255	3	346						
	1980	21	22	11	50	310	3	417						
	1985	25	26	13	59	365	2	490						
	1990	28	30	14	67	420	2	561						
	1995	31	34	15	76	470	2	628						
	2000	34	38	15	84	525	2	698						
Japan	1975	10	—	—	10	—	—	20						
	1980	12	—	—	15	—	—	27						
	1985	15	—	—	15	—	—	30						
	1990	20	—	—	15	—	—	35						
	1995	25	—	—	15	—	—	40						
	2000	30	—	—	20	—	—	50						
Other Countries	1975	6	23	7	4	47	4	91						
	1980	6	27	8	3	58	5	107						
	1985	6	31	9	3	68	5	122						
	1990	7	35	10	3	78	6	139						
	1995	7	39	11	3	89	6	155						
	2000	7	43	11	3	99	6	169						
Product Totals	1975	139	44	19	65	310	57		634					
	1980	169	52	21	77	375	68			762				
	1985	191	61	25	87	439	72				875			
	1990	215	69	27	96	504	83					994		
	1995	233	78	30	106	565	88						1,100	
	2000	261	87	30	120	630	98							1,226



several factors, including the previously mentioned expanded housing goal. The effect of technological change is also uncertain. Much depends on the maintenance of a favorable price relationship with competing materials, and a continued preference for wood products by the construction trades. A shift to more multiple-unit construction and mobile homes could have an adverse effect.

*Japan*—In 1966, Japan imported 515 million board feet of lumber, of her total consumption of 15.5 billion board feet. The Boston Consulting Group, Inc. (1969) projects total Japanese demand for lumber as being 18,710 million board feet in 1985. Another widely circulated projection suggests 24,000 million board feet for 1975. When the latter trend is carried to 2000, a demand of 81.4 billion board feet in 2000 is forecast. Given hope for reasonable self-sufficiency by 2000 (Table 2) and the forecast population growth, such a projection may be unrealistic, and a more acceptable figure might be 50 billion board feet by 2000.

In 1966, Canada exported 272 million board feet of lumber to Japan, all from British Columbia (B.E.S., 1968). In 1950 the comparable total was less than 100 thousand feet. It is expected that exports of lumber to Japan will reach 620 million board feet by 1975, at a growth rate of 8.5% a year. By 2000, the export of lumber to Japan should have reached 1,460 million board feet, at an average annual growth rate of 5.2%.

*United Kingdom*—In 1966 the United Kingdom imported 3,714 million board feet of lumber. Canada provided 788 million board feet, or 21%. Lumber exports to the United Kingdom have been increasing at a rate of 6.2% annually.

Canada's major competitors in the United Kingdom lumber market are Russia, with 24% of lumber imports, and the Scandinavian countries, with a total of 34% of imports. It seems likely that these countries will maintain their favored relationship, or even increase their share of imports.

On the assumption of past trends and current expectations for the future of the United Kingdom's economy, it is forecast that exports of lumber to this destination from Canada will reach 929 million board feet by 1980 and 1,155 million board feet by 2000, at a growth rate of 1.2%.

*Other Countries*—Exports of lumber to countries other than the United States, the United Kingdom and Japan stood at 477 million board feet in 1966, of which 448 million board feet were softwood shipped from British Columbia. Exports of lumber to these other countries are projected as 663 million board feet in 1980 and 904 million board feet in 2000. Two additional exports of interest in 2000 will be plywood (170 million square feet) and hardwood veneer (37 million square feet.).

#### Domestic Consumption of Lumber

*Softwood Lumber*—Between 1950 and 1968, consumption of softwood lumber rose from 2.8 billion to 3.9 billion board feet, thus increasing 39%, or at an annual rate of 1.9%. It is forecast that consumption will increase to 5.7 billion board feet by 2000. This gives an annual increase of 1.1%. This change is consistent with the trend to multifamily dwellings and the somewhat increased substitution by softwood plywood as well as the decreasing use of lumber by other industries.

TABLE 7. PROJECTED EXPORTS OF WOOD PRODUCTS FROM CANADA, BY COUNTRY OF DESTINATION, 1975-2000

Country	Year	Logs & Bolts	Pulp-wood	Pulp-chips	Poles & Pilings	Railroad Ties	Fence Posts	Soft-wood Lumber	Hard-wood Lumber	Soft-wood Veneer	Hard-wood Veneer	Soft-wood Plywood	Hard-wood Plywood	Hard-wood Flooring	Shingles & Shakes	Misc. Sawn
		MM fbm	M cds	M tons	thousand pieces			million bd ft				million sq ft 1/10" basis	million sq ft 3/8" basis	MM bd ft	M sq	MM bd ft
United States	1975	19	580	1,100	245	105	3,765	6,070	130	35	375	2	24	9	2,170	50
	1980	17	500	1,200	245	115	4,245	6,880	135	35	445	3	23	10	2,165	55
	1985	16	430	1,200	250	120	4,720	7,680	140	30	510	3	23	10	2,160	60
	1990	15	370	1,200	250	120	5,200	8,490	145	30	575	4	23	11	2,160	64
	1995	13	310	1,200	255	125	5,680	9,290	150	30	640	4	23	12	2,155	67
	2000	13	260	1,200	255	125	6,155	10,100	155	30	700	5	23	12	2,150	70
United Kingdom	1975	5	80	—	—	150	—	860	9	—	1	440	3	16	12	—
	1980	5	80	—	—	140	—	920	9	—	1	540	4	20	12	—
	1985	5	80	—	—	130	—	975	9	—	1	640	4	22	11	—
	1990	5	80	—	—	120	—	1,030	9	—	1	745	5	26	10	—
	1995	5	80	—	—	110	—	1,090	10	—	1	845	6	29	10	—
	2000	5	80	—	—	100	—	1,145	10	—	1	945	6	32	9	—
Japan	1975	115	—	—	130	3	—	620	*	—	—	—	—	—	—	—
	1980	120	—	—	150	3	—	780	*	—	—	—	—	—	—	—
	1985	130	—	—	170	3	—	1,040	*	—	—	—	—	—	—	—
	1990	130	—	—	190	2	—	1,180	*	—	—	—	—	—	—	—
	1995	135	—	—	205	1	—	1,320	*	—	—	—	—	—	—	—
	2000	135	—	—	220	—	—	1,460	*	—	—	—	—	—	—	—
Other Countries	1975	4	490	—	1	—	1	600	3	—	17	75	**	1	15	***
	1980	5	535	—	1	—	1	660	3	—	21	95	**	1	15	***
	1985	6	570	—	1	—	1	720	3	—	25	110	**	1	15	***
	1990	6	600	—	1	—	1	780	4	—	29	130	**	1	15	***
	1995	7	625	—	1	—	1	840	4	—	33	150	**	1	10	***
	2000	8	650	—	1	—	1	900	4	—	37	170	**	1	10	***
Product Totals	1975	143	1,150	1,100	376	258	3,766	8,150	142	35	393	517	27	26	2,197	50
	1980	147	1,115	1,200	396	258	4,246	9,240	147	35	467	638	27	31	2,192	55
	1985	157	1,080	1,200	421	253	4,721	10,415	152	30	536	753	27	33	2,186	60
	1990	156	1,050	1,200	441	242	5,201	11,480	158	30	605	879	28	38	2,185	64
	1995	160	1,015	1,200	461	236	5,681	12,540	164	30	674	999	29	42	2,175	67
	2000	161	990	1,200	476	225	6,156	13,605	169	30	738	1,120	29	45	2,169	70

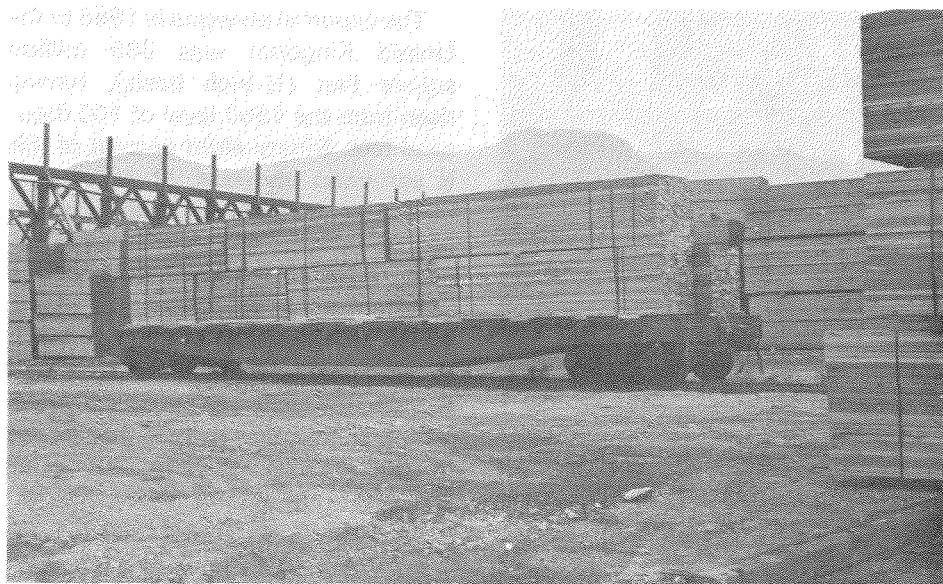
\*Less than 1.0 million bd ft

\*\*Less than 0.5 million square feet.

\*\*\*Less than 0.5 million fbm

—Nil.





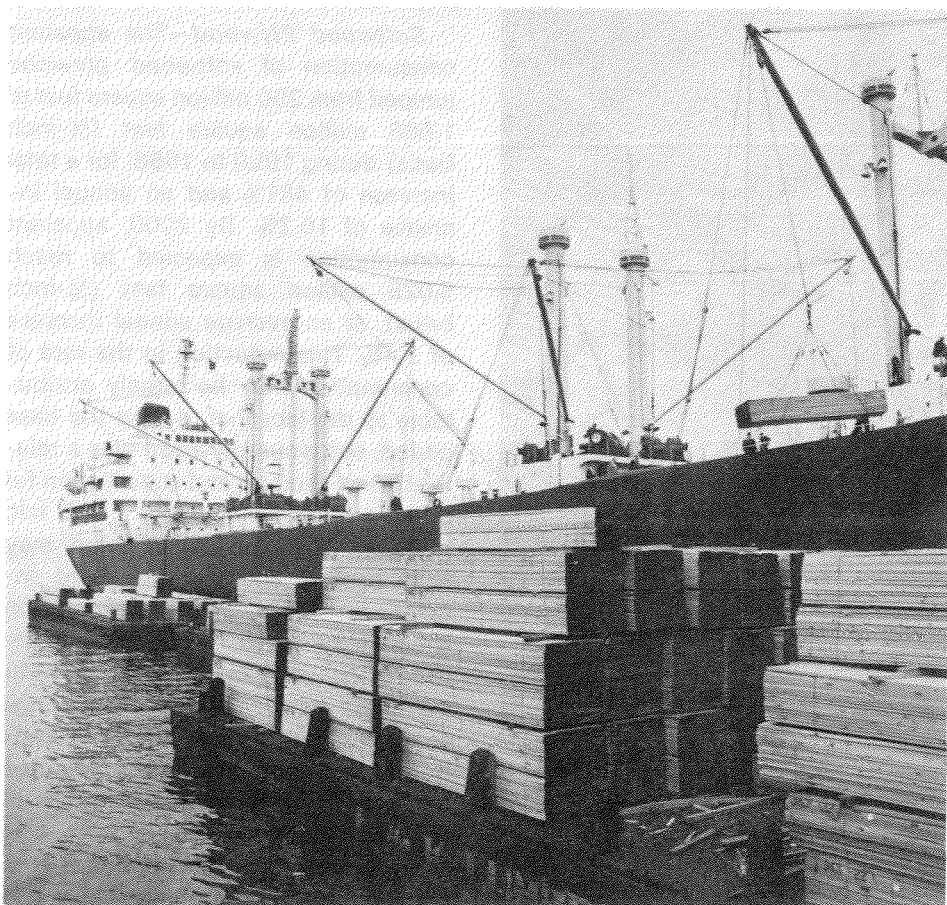
*Hardwood Lumber*—Hardwood lumber is used primarily in the furniture industry, though significant amounts are employed as trim and panelling in the construction industry. For this reason it is vulnerable to replacement by substitute products, as furniture design is influenced by fashion. Consumption of hardwood lumber has increased somewhat since the early 1950's. It is expected to continue to increase slightly and to reach 708 million board feet by 2000. Changes in the design of furniture, the increasing substitution of plastic, glass, and metal, and the increasing use of veneer-faced panels in furniture construction must all be considered. These changes may be fostered by the increasing cost of solid wooden furniture, as well as by an increase in the scarcity of quality hardwood logs.

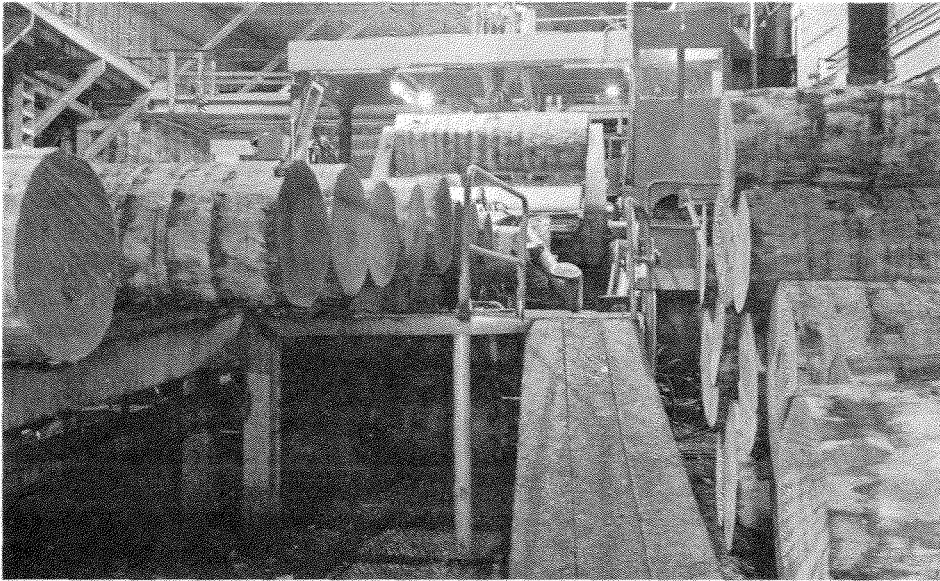
#### Exports of Plywood and Veneer

*United States*—Projections indicate plywood exports to the United States will decrease from 34 million square feet ( $\frac{3}{8}$ -inch basis), of which 3.3 million are softwood, to 28 million square feet ( $\frac{3}{8}$ -inch basis) in 2000. The proportion of softwood will rise. The net decrease will largely be due to increased imports of tropical hardwoods from Southeast Asia and a continued high tariff barrier.

Veneer exports to the United States, on the other hand, will increase to 730 million square feet ( $\frac{1}{10}$ -inch basis), of which 700 million square feet will be hardwood veneer.

*United Kingdom*—The export of plywood to the United Kingdom has increased rapidly since 1950. This is partially due to the rapid growth of the plywood industry since that time, and partially due to the high quality of British Columbia Douglas-fir plywood.





The export of plywood in 1966 to the United Kingdom was 369 million square feet ( $\frac{3}{8}$ -inch basis), having risen from the 1950 level of 100 thousand feet. Ninety-eight percent of this is softwood plywood, of which 279 million square feet were British Columbia Douglas-fir (B.E.S., 1968). Canada's main competitor in the United Kingdom plywood market is Finland, which provides 30% of all imports.

It is expected that the exports of plywood to the United Kingdom will reach 544 million square feet ( $\frac{3}{8}$ -inch basis) in 1980 and 951 million in 2000, at an annual growth rate of 3.6%.

#### Domestic Consumption of Plywood and Veneer

*Softwood Plywood*—The apparent consumption of softwood plywood jumped from 290 million square feet to 1,685 million square feet ( $\frac{3}{8}$ -inch basis) during 1950 to 1968, for a total increase of 481% and an annual increase of 10.2%. By 2000, apparent consumption is expected to reach 5,025 million square feet ( $\frac{3}{8}$ -inch basis), at an average annual increase of 3.4%. This reduction in the rate of consumption may be largely attributable to the fact that, during the base period, softwood plywood was a relatively new product and substitution for other products was rapid. It is felt, however, that this substitution may have peaked and that the rapid increase in the rate of consumption should slow down. Owing to the many uses of plywood in construction other than that of single-family dwellings (e.g., concrete forms), the consumption of softwood plywood is expected to advance more rapidly than that of softwood lumber.

*Hardwood Plywood*—The rise in the consumption of hardwood plywood

has exceeded that of softwood plywood. The consumption of hardwood plywood rose from 35 million square feet in 1950 to 407 million square feet ( $\frac{3}{8}$ -inch basis) in 1968, for an increase of 1,163%, and an average annual increase of 13.7%. The greatest rise has occurred since 1956, and has been due largely to an increase of hardwood panelling in homes, the greater availability of inexpensive imported hardwood panels, and an increase in mobile-home construction. Recently, increased numbers of "do-it-yourselfers" have fueled the boom by finishing basements and summer homes. The rapid growth is expected to continue, but at a somewhat slackened pace. The consumption of hardwood plywood is expected to be 2,611 million square feet ( $\frac{3}{8}$ -inch basis) by 2000, after an average annual increase of 5.9%. This continued substantial rate of growth is based on a continuation of past trends, especially the increased importance of mobile homes, which are generally panelled exclusively with hardwood plywood.

**Hardwood Veneer**—The consumption of hardwood veneer was erratic during 1950-1968, though it has increased markedly since the late 50's. This was due to changes in tastes in

furniture, increasing availability of imported hardwood veneers, and growing activity in the construction industry, which uses many veneer-covered flush doors. The change from lumber to veneer in the furniture industry and an increase in the availability of imported veneers is expected to increase apparent consumption to 236 million square feet by 2000.

#### Exports of Other Wood Products

**United States**—Exports of wood products other than lumber, plywood, and veneer to the United States consist largely of hardwood flooring, shingles and shakes, raw wood materials, and other minor products.

Hardwood flooring exports to the United States show an upward trend, from 7 million board feet in 1968 to 12 million board feet in 2000. The increasing imports of hardwood flooring from Canada are largely due to better supplies of hard maple and birch in this country. The expectation of increased export to the United States is in the face of declining total demand in that country for hardwood flooring.

Exports of shingles and shakes to the United States are projected to

decline slightly from 2.6 million squares in 1968 to 2.2 million squares in 2000. Despite increasingly restrictive building and fire codes, wood shingles and shakes are making an architectural comeback. However, because the demand for these products is essentially of the luxury-market type, any fluctuations in the economy have immediate and violent effect.

Imports of logs and bolts and of pulpwood into the United States from Canada have generally declined since 1950. Exports of pulpwood to the United States are expected to fall from 804 thousand cords to 260 thousand cords. Exports of pulpchips to the United States will average 1,100 thousand tons by 1975 and 1,200 thousand tons by 1980, and will thenceforth remain constant.

The export market for miscellaneous sawn products such as box shooks, lath, squares, and blanks will increase as the United States saw-timber supply diminishes. Exports of these products should reach 70 million board feet by 2000.

Projected to 2000, manufactured primary forest products exported will reach 255 thousand poles and pilings, 6,155 thousand fence posts and 125 thousand railroad ties.

TABLE 8. PROJECTIONS OF CANADA'S APPARENT DOMESTIC CONSUMPTION OF WOOD PRODUCTS, 1975-2000

Year	Railroad Ties	Flatted Mine Timbers	General Primary*	Softwood Lumber	Hardwood Lumber	Hardwood Veneer	Softwood Plywood	Hardwood Plywood	Hardwood Flooring	Shingles & Shakes	Misc. Sawn
	thousand pieces	MM ft <sup>3</sup>		Million bd ft			million sq ft 1/10" basis    3/8" basis		MM bd ft	M squares	MM bd ft
1975	4,186	742	210	4,302	536	151	2,175	782	79	90	7
1980	4,186	742	202	4,571	570	158	2,528	1,094	83	90	5
1985	4,186	742	198	4,844	604	181	2,978	1,465	95	90	5
1990	4,186	742	196	5,114	639	198	3,563	1,918	104	90	5
1995	4,186	742	196	5,387	673	219	4,200	2,340	115	90	5
2000	4,186	742	196	5,660	708	236	5,025	2,611	124	90	5

\*Includes fuelwood, round mine timbers, poles and pilings, fence posts and rails, wood for charcoal, and miscellaneous roundwood.



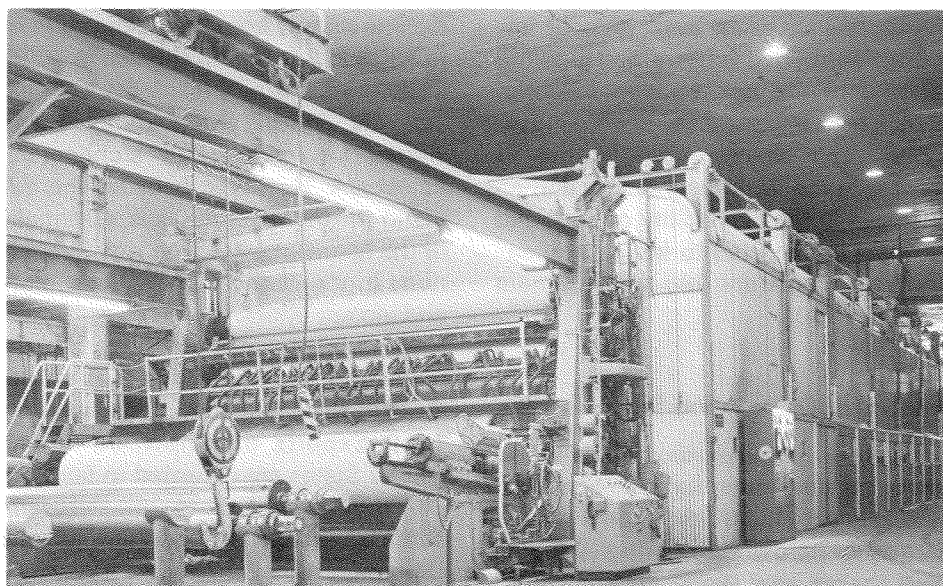
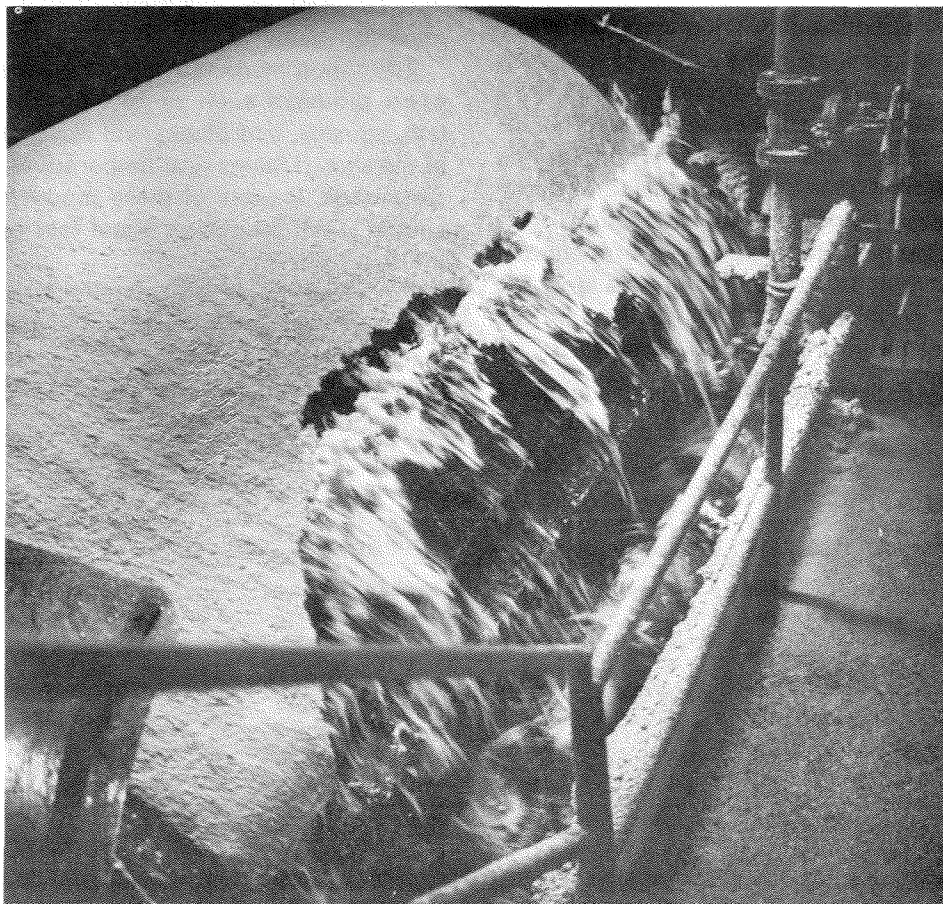


Figure 1. A large roll of paper being processed in a paper mill.

Source: U.S. Forest Service, 1998.



*Japan*—Japan has traditionally preferred to import forest products in an unmanufactured state. Canada, especially British Columbia, is a major source of the logs, bolts, and pulping material it imports. Canada is unlikely in the long run to export significantly more logs and bolts to Japan than in 1968, when 113 million board feet were exported. This is largely due to British Columbia's requirement that the primary manufacture of all timber from Crown lands take place within the province, with certain minor exceptions (Austin, 1969). The exports of logs and bolts to Japan will average only 135 million board feet in 2000. Minor and intermittent amounts of pulpwood and pulpchips will also be exported, as in the past.

Exports of other forest products to Japan are of minor importance. Only exports of poles and pilings show much increase. This increase is tied to the expected growth of new housing in Japan. The traditional Japanese house contains much wood, including about 30 board feet of poles per 100 square feet of floor space. The export of poles and pilings to Japan is expected to increase to 220 thousand pieces by 2000.

*United Kingdom*—Other manufactured wood products, namely railroad ties, veneer, flooring and shingles show an aggregate decline. Hardwood flooring shows the only encouraging trend, more than doubling by 2000. Specifically, exports of railroad ties to the United Kingdom are expected to fall to 100 thousand pieces by 2000, exports of hardwood veneer to remain constant at 1 million square feet, exports of shingles and shakes to decline to 9 thousand squares, and exports of hardwood flooring to increase to 32 million board feet.

Exports of logs, bolts, and pulpwood to the United Kingdom are relatively in-

significant and have, in fact, declined since 1950-1951. Imports of logs and bolts into the United Kingdom are mostly hardwoods from Africa. Exports of logs and bolts to the United Kingdom from Canada are expected to remain at an average of 5 million board feet until 2000.

Pulpwood exports are relatively more important than logs and bolts, with significant shipments from the Atlantic Provinces. Canada has the largest share of United Kingdom pulpwood imports, followed by Russia and Finland. Pulpwood exports are expected to remain constant at 80 thousand cords annually until 2000.

*Other Countries*—Exports of logs and bolts to other countries have been small but growing. In 1968, 3.9 million board feet of logs and bolts were exported to these countries. Exports in 2000 should reach 8 million board feet.

Exports of pulpwood are much more important, totalling 194 thousand cords in 1968. By 2000, exports of pulpwood to other countries should reach 650 thousand cords annually.

#### Domestic Consumption of Other Wood Products

*Hardwood Flooring*—The consumption of hardwood flooring has remained at a fairly constant level in Canada, though it has declined somewhat in recent years. Peak consumption during 1950 to 1968 was 88 million board feet and was reached in 1958. It dropped to 58 million in 1968, decreasing by 52%. Since 1960, though, per capita consumption has remained fairly constant. It might therefore be expected that total consumption will increase as population increases. Domestic consumption of hardwood flooring will climb to 124 million board feet by the year 2000.

*Shingles and Shakes*—The consumption of shingles and shakes presents a very erratic picture, but a significant downward trend exists. It is forecast that consumption of shingles and shakes will fall to a low of 90 thousand squares by 1975 and continue at this level through 2000.

*Miscellaneous Sawn Products*—The years 1950-1968 saw a rapid decline in the consumption of miscellaneous sawn products from 66 million board feet to 5 million board feet. This change was caused largely by substitution of nonwood products. For instance, the rapid substitution of cardboard for wooden boxes has resulted in a decrease in the consumption of box shooks of more than 5% a year since 1950. Substitution of gypsum lath for wooden lath has also occurred. In various industrial processes wood has also been replaced by plastic and metal. It is therefore forecast that consumption of miscellaneous wood products will remain at about 5 million board feet through 2000.

*General Primary*—The classification "general primary" products includes all those materials sold "in the round". It is a heterogeneous mixture including fuelwood, round mine timbers, poles and pilings, fence posts and rails, wood for charcoal, and miscellaneous roundwood. The majority of the volume is sold for processing and use in non-forestry sectors. Analysis shows a firm trend, which by 1990 will result in a constant annual consumption of 196 million cubic feet of general primary wood products thereafter. More convenient fuels, larger farm units, an increasing use of wood preservatives, and a trend towards substitute materials are all factors that support this trend.

*Railroad Ties*—In forecasting the consumption of railroad ties in Canada,

the operative indicator is the number of miles of track in operation. Consumption is forecast to be 4,186 thousand ties in 2000.

This projection rests on the assumption that no major expansion of railroads or major reconstruction projects will occur during the projection period. Indications are present, in fact, that owing to improved preservatives and the substitution of concrete ties in urban areas, consumption may decrease. It is also expected that the number of miles of railroad operated will decrease in the near future, if Canada's course follows that of the United States. These expectations cannot be quantified; so our best estimate is the mean of past consumption.

*Flatted Mine Timbers*—In spite of a concurrent 250% increase in Canadian mineral production, the data for the consumption of flatted mine timbers were relatively constant during 1950-1968.<sup>6</sup> This relative constancy was due largely to such changes in the technology of mining as an increased use of steel bolts and other metal supports and the use of concrete in shafts. Given these conflicting trends, it is expected that the 1950-1968 average use of flatted mine timbers will continue. In 2000 the apparent domestic consumption will be 742 thousand pieces.

#### Production

Production of forest products in Canada has kept pace with the remainder of the economy.<sup>7</sup> Between 1961 and 1968, the value of shipments from the forest products industries grew from \$2.7 billion to \$4.4 billion at an annual rate of 7.2%. The pulp and paper industry grew from \$1.6 billion to \$2.4

<sup>6</sup>Derived from the Canada Year Book, various issues.

<sup>7</sup>Canada Year Book, 1969.

TABLE 9. PROJECTED PRODUCTION OF PAPER IN CANADA, 1975-2000

Year	Newsprint	Printing Paper	Fine Paper	Tissue and Sanitary Paper	Wrapping Paper	Industrial Paper	Paperboard	Building Board	Total, all paper and board <i>other than newsprint</i>	Total, all Paper
thousand tons										
1975	9,545	510	448	404	557	103	2,463	452	4,937	14,482
1980	10,755	656	582	548	677	92	3,107	516	6,178	16,933
1985	11,967	795	740	693	814	86	3,856	572	7,556	19,523
1990	13,178	990	927	901	947	74	4,746	636	9,221	22,399
1995	14,318	1,215	1,104	1,155	1,058	57	5,579	693	10,861	25,179
2000	15,345	1,391	1,223	1,334	1,173	38	6,162	756	12,077	27,422

TABLE 10. PROJECTED PRODUCTION OF WOOD PULP IN CANADA, 1975-2000

Year	Exported as Wood Pulp	Exported as Paper	Used in Canada's Consumption of Paper and Board	Total Production*
thousand tons				
1975	5,618	9,572	3,395	18,585
1980	6,891	10,745	4,275	21,911
1985	8,049	11,874	5,275	25,198
1990	9,058	12,962	6,495	28,515
1995	10,026	13,982	7,705	31,713
2000	11,639	14,988	8,565	35,192

\*About 50 thousand tons per year could be added for sales to the synthetic textiles industries.

TABLE 11. PROJECTED PRODUCTION OF WOOD PRODUCTS IN CANADA, 1975-2000

Year	Logs and Bolts for Export	Pulpwood for Export	Pulpchips for Export <sup>a</sup>	General Primary	Railroad Ties	Flatted Mine Timbers	Soft-wood Lumber	Hard-wood Lumber	Softwood Veneer for Export	Hard-wood Veneer	Soft-wood Plywood	Hard-wood Plywood	Hard-wood Flooring	Shingles & Shakes	Misc. Sawn
	MM fbm	M cords	M tons	MM ft <sup>3</sup>	M pieces		MM bd ft		1/10" basis	MM sq ft 3/8" basis			MM bd ft	M sq	MM bd ft
1975	143	1,150	1,100	215	4,444	742	12,182	678	35	544	2,692	809	105	2,287	57
1980	147	1,115	1,200	208	4,444	742	13,811	717	35	625	3,166	1,121	114	2,282	60
1985	157	1,080	1,200	204	4,439	742	15,259	756	30	717	3,731	1,492	128	2,276	65
1990	156	1,050	1,200	203	4,428	742	16,594	797	30	803	4,442	1,946	142	2,275	69
1995	160	1,015	1,200	204	4,422	742	17,927	837	30	893	5,199	2,369	157	2,265	72
2000	161	990	1,200	204	4,411	742	19,265	877	30	974	6,145	2,640	169	2,259	75

\*Mill residue is not included in annual roundwood drainage.

Figure 10. Origin of "market" woodpulp production, 1966

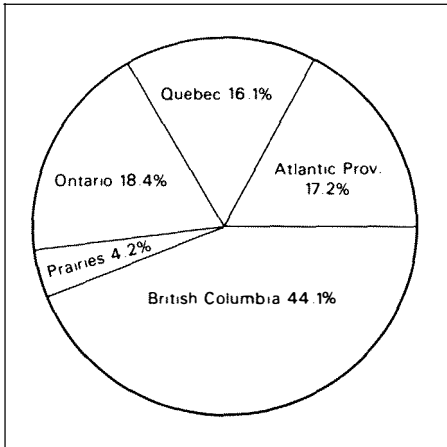


Figure 11. Origin of paper and board production, 1966

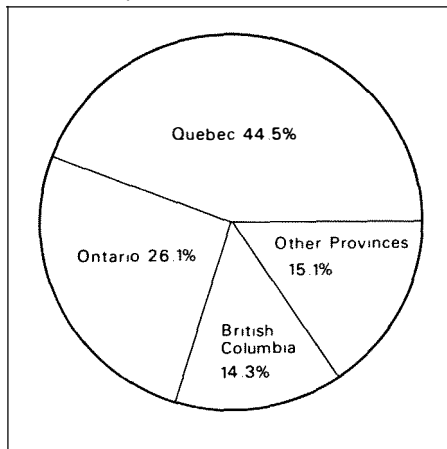
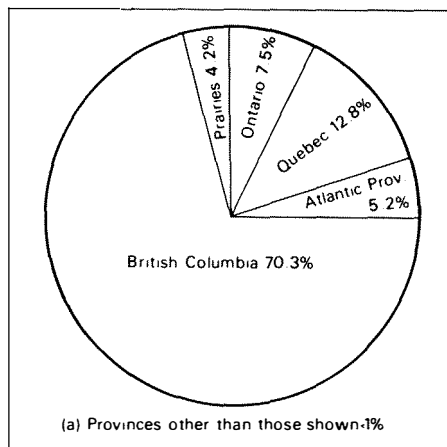


Figure 12. Origin of lumber production, 1966



billion, 6.0% annually, while the wood products industry grew from \$1.0 billion to \$1.9 billion, at a 9.5% annual rate.

Projections of production in the pulp and paper industry (Tables 9 and 10) show newsprint production increasing at 1.9% annually to 15,345 thousand tons by 2000. Production of other papers and board will increase more rapidly, at an annual rate of 3.7%, to 12,077 thousand tons by 2000. Pulp production will reach 35,192 thousand tons by 2000, of which 11,639 thousand tons will be exported as pulp. The remainder will be consumed domestically in the production of paper and board. A small portion will be consumed domestically by the synthetic textile industries (about 50 thousand tons).<sup>8</sup>

Production of lumber will increase significantly by 2000, to 20,142 million board feet, at an annual rate of increase of 1.8%. Plywood will perform significantly better, increasing at an annual rate of 4.2% to 8,785 million square feet ( $\frac{3}{4}$ -inch basis) by 2000. Production of other forest products will, in aggregate, not increase significantly by 2000.

Regional production of forest products is quite unevenly distributed. Three provinces—British Columbia, Ontario, and Quebec—are dominant in forest products manufacturing (Figures 10, 11, and 12). British Columbia, for example, produces about 44% of all market wood pulp, 14% of all paper and board, and 70% of all lumber. Ontario produces 18% of all market wood pulp, 26% of all paper and board, and 8% of all lumber. Quebec produces 16% of the market wood pulp, 45% of the paper and board, and 13% of the lumber.

British Columbia, Ontario, and Quebec also dominate the export market in forest products. British Columbia is

dominant in the wood-products market, accounting for 80%-85% of all lumber exported, 90%-95% of all plywood, 45%-50% of all veneer, and 95%-100% of all shingles and shakes.

British Columbia is also the province with the largest exports of wood pulp, 40%-45%. Ontario trails with 15%-20%; Quebec is third with slightly less.

In the newsprint export market, Quebec is the acknowledged leader, shipping 45%-50% of all the newsprint exported. Ontario follows with 15%-20%; British Columbia ships slightly less. It is likely that these regional export comparisons will remain valid, except that British Columbia may enlarge its share of newsprint.

## A Comparison with Past Forecasts

A brief comparison of the production forecasts made in this paper with those proposed in previous studies is useful. Three studies are of special interest in this regard. One, prepared by Davis *et al.* (1957), is commonly referred to as the "Gordon Commission Report". The second, prepared by D. A. Wilson (1961), was presented to the Resources for Tomorrow Conference. The third and most recent was prepared by Mahood and Reed (1966) for the National Forestry Conference of 1966.

In looking at individual product comparisons (Table 12), projections for plywood, newsprint, paper and board, and wood pulp show little difference. Only in newsprint is the present study marginally more conservative. Pulp, and paper and board, show small increases over previous projections. This may be explained largely by existing and expected world over-capacity.

<sup>8</sup>Special information — Dominion Bureau of Statistics.

TABLE 12. A COMPARISON OF PRODUCTION PROJECTIONS FOR CANADA'S FOREST PRODUCTS

Source	Year	Lumber	Plywood	Newsprint	Other Paper and Board	Export Wood Pulp
		billion bd ft	billion sq ft 3/8" basis		thousand tons	
1	1975	14.0	—	11,000	3,518	4,420
2		—	3.30	—	—	—
3		10.6	2.25	11,100	4,400	—
Present Study		12.6	3.50	9,545	4,937	5,618
1	1980	11.6-12.1	—	12,500	4,107	5,045
Present Study		14.2	—	10,755	6,178	6,891
2	2000	26.5	9.90	—	—	—
Present Study		19.5	8.79	—	—	—

Sources : 1. Davis, J., *et al*, 1957  
 2. Mahood, I. and Reed, F. L. C., 1966.  
 3. Wilson, D. A., 1961.

TABLE 13. WOOD RESIDUE PRODUCTION, EXPORTS AND CONSUMPTION, CANADA, 1975-2000

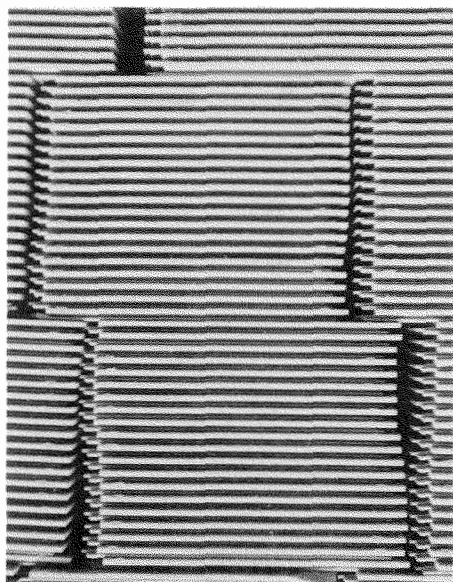
Year	Production	Exports	Consumption
	millions of cubic feet		
1975	970	110	860
1980	1,070	120	950
1985	1,120	120	1,000
1990	1,320	120	1,200
1995	1,470	120	1,350
2000	1,540	120	1,420

TABLE 14. ROUNDWOOD REQUIREMENTS AND NET FOREST DEPLETION, CANADA, 1975-2000

Year	Roundwood Volume Required for:				Total Roundwood Requirement	Residue Consumption (Domestic)	Roundwood Depletion
	Paper & Board	Pulp for Export	Wood Products	Raw Materials for Export <sup>a</sup>			
	billion cubic feet (roundwood equivalent)						
1975	1.67	0.90	2.37	0.12	5.06	0.86	4.20
1980	1.96	1.11	2.67	0.12	5.86	0.95	4.91
1985	2.26	1.29	2.97	0.12	6.64	1.00	5.64
1990	2.61	1.45	3.25	0.12	7.43	1.20	6.23
1995	2.94	1.60	3.55	0.12	8.21	1.35	6.86
2000	3.23	1.85	3.84	0.12	9.04	1.42	7.62

<sup>a</sup>Except chips.





In the case of lumber, the present study is much more conservative than that of Mahood and Reed. This may be explained by the decline that has occurred in the North American birthrate since 1966. With a fairly constant per capita consumption of lumber in North America, this will lead to a slowdown in the rate of increase for lumber consumption. All-in-all, given the accuracy of the projection methods used in this and previous reports, there are few significant changes.

## Roundwood Consumption

The utilization of roundwood in Canada rose from 3.18 billion cubic feet in 1961 to 3.97 billion cubic feet in 1968 the annual change being 3.5%. The pulpwood utilized increased at 2.2% a year, and the logs and bolts at 4.7% a year.

Table 14 outlines the projected depletion of Canada's wood resources due to the manufacture of forest products.<sup>9</sup> The utilization of roundwood will continue to increase, at an annual rate of 2.2% a year, to 7.62 billion cubic feet by 2000. Some of this decline from a 3.5% annual increase may be largely attributed to increased use of wood residues.<sup>10</sup> The proportion of roundwood being harvested as pulpwood will increase. Utilization of pulpwood will grow at 3.1% a year. Use of logs and bolts, on the other hand, will only grow at 2.0% annually.

Present utilization of roundwood indicates that raw materials used in the pulp and paper industry consist 94% of softwood and 6% of hardwood. In the

<sup>9</sup>Roundwood utilization, by product, is outlined in Table 47 (Appendix).

<sup>10</sup>Table 13.

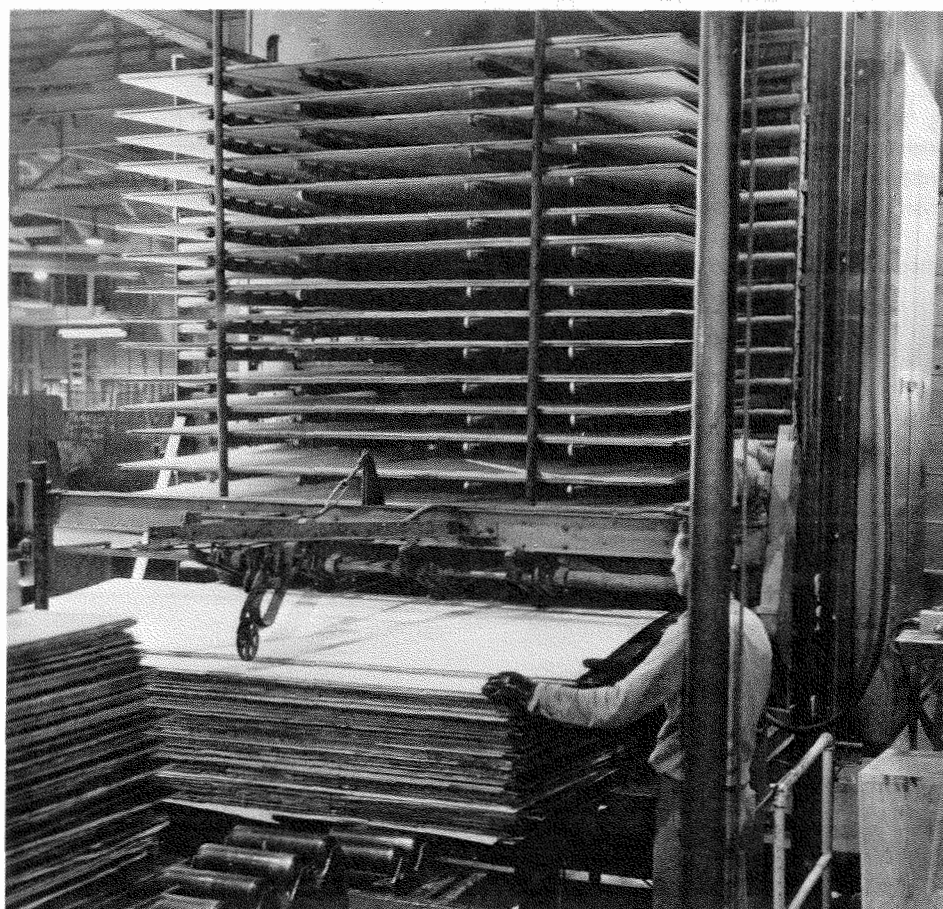


TABLE 15. ESTIMATED PRODUCTION AND UTILIZATION OF ROUNDWOOD IN CANADA, BY PRODUCT AND REGION FOR 1967, IN MILLIONS OF CUBIC FEET AND PERCENT OF TOTAL UTILIZATION

	BRITISH COLUMBIA		PRAIRIES PROVINCES		ONTARIO		QUEBEC		ATLANTIC PROVINCES		CANADA <sup>a</sup>	
	Quantity	% of Regional Production	Quantity	%	Quantity	%	Quantity	%	Quantity	%	Quantity	%
Production of Logs and Bolts (logs and bolts used by sawmills)	1,297.5 <sup>b</sup>	82.5	109.9	51.9	191.0	31.5	298.2	29.8	106.9	26.5	2,003.5	52.8
(logs and bolts used by veneer and plywood mills)	(1,116.7) <sup>c</sup>	(71.0)	(84.4)	(39.3)	(155.2)	(25.6)	(271.3)	(27.1)	(90.2)	(22.4)	(1,717.8)	(45.3)
(logs and bolts used by shingle mills)	(105.4)	(6.7)	na		na		na		na		(157.6)	(4.2)
	(32.6)	(2.1)	na		na		na		na		na	
Production of Pulpwood (pulpwood used by pulp and paper mills)	255.1	16.2	58.2	27.5	369.8	60.9	618.4	61.9	258.9	64.3	1560.4	41.1
(pulpchips used by pulp and paper mills)	(255.1)	(16.2)	na		(367.7)	(60.6)	(581.7)	(58.2)	na		(1,490.8)	(39.3)
	(341.9)	—	na		(42.5)	—	(60.5)		na		(498.9)	—
Production of Other Products <sup>d</sup>	20.0	1.3	43.6	20.6	46.3	7.6	83.2	8.3	37.1	9.2	230.2	6.1
Total Roundwood Production	1,572.6	100	211.7	100	607.1	100	999.8	100	402.9	100	3,794.1	100
Percentage of Canadian Production	41.4%		5.6%		16.0%		26.4%		10.6%		100%	

Sources: D.B.S. "Logging" Cat. No. 25-201. D.B.S. "Pulp & Paper Mills" Cat. No. 36-204. D.B.S. "Sawmills & Planing Mills" Cat. No. 35-204. "Selected Forest Industry Statistics of British Columbia", British Columbia Department of Industrial Development, Trade and Commerce.

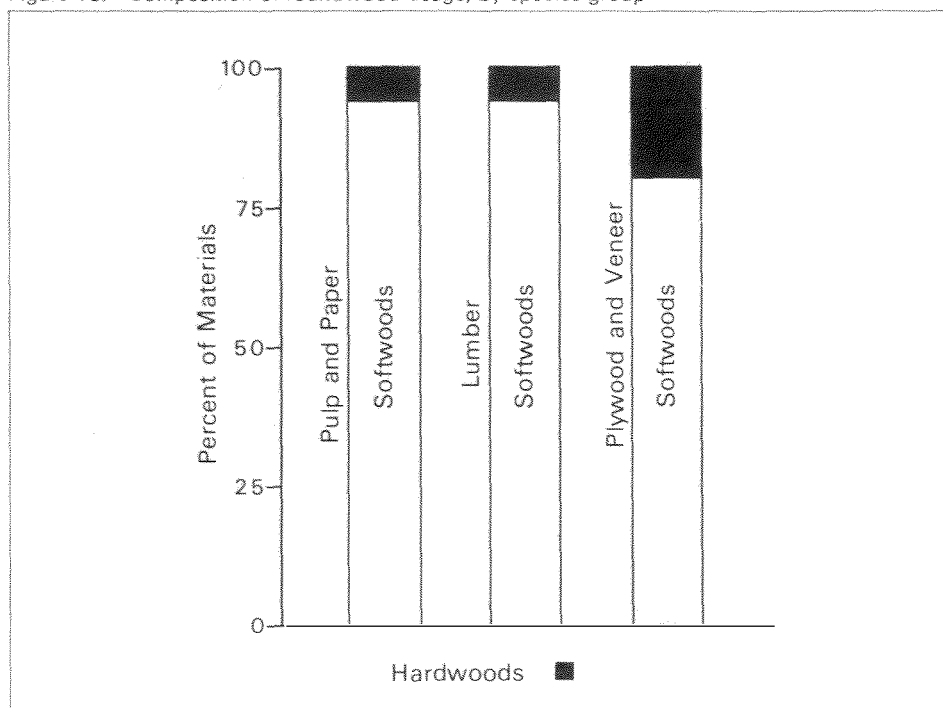
<sup>a</sup>Does not include the Yukon or the Northwest Territories.

<sup>b</sup>Reported British Columbia logs and bolts production adjusted downwards to account for wood used in pulp manufacture.

<sup>c</sup>Figures in parentheses do not add into totals.

<sup>d</sup>Includes fuelwood, poles, posts, railings, miscellaneous roundwood and products not specified.

Figure 13. Composition of roundwood usage, by species group



sawmilling industry, the same proportion holds, while the plywood and veneer industry consumes 80% softwood and 20% hardwood (Figure 13).

While demands for specific products in the lumber and plywood and veneer industries dictate the species utilized, it is by and large technological change that will influence the species utilized in the production of wood pulp. In general, there is a movement toward kraft and neutral-sulphite semichemical pulping in many new installations, which allows the use of more hardwoods (Keays, 1970). While predictions are difficult, it is estimated that hardwood input to the pulp and paper industry will reach 20% by 2000.<sup>11</sup> In the lumber industry, hardwood utilization will remain at 6%, while the plywood and veneer industry will show an increase to about 30% hardwoods.

Estimates of roundwood production indicate that in 1967 British Columbia, with 41.4%, was most important, followed by Quebec, with 26.4% (Table 15). Such figures are impossible to predict for the year 2000 with the data available.



<sup>11</sup>Keays, J. L. Projection of world demand for wood-fiber products to the year 2000. Department of Fisheries and Forestry, Canadian Forestry Service, Vancouver Forest Products Laboratory. Unpublished manuscript.





# The Supply of Timber

## Land and the Timber Supply

*"The pulpwood supply situation has become so serious that only by radical, constructive and comprehensive measures can decadence in the forest industry of eastern Canada be averted."<sup>12</sup>*

Every few years revised provincial forest inventory figures are compiled nationally and analyzed in the light of new depletion data. Shortages or surpluses are predicted. Since timber supply in the economic sense is only indirectly related to the actual resource, every prediction of supply based on gross timber volumes leaves much to be desired. The current analysis may be somewhat improved because of additions to data, their greater refinement and their new economic connotations, but it remains far from satisfactory.

If the conclusions appear to be less definitive than previously, it is because of the belief that the manipulation of coarse data to make specific points invites errors and may be quite misleading. Instead, the reader is provided with an understanding of the new categories of information and the constraints upon their use.

## Data Sources and Collection Format

The inventory data used in this paper are supplied by the provinces or the federal agencies responsible for federal lands. The Dominion Bureau of Statistics supplied the volume-depletion data. All data were the latest available in 1968, or were average annual figures for the period 1964 to 1968, inclusive.

The format selected for data collection stresses area information rather

than volume but does not ignore volume. The area approach to presenting forest information was considered advantageous because it was possible to compare depletion and overall forest land data under similar categories or breakdowns. Analyzing volume data has always been difficult, not only because of differing mensurational methods and utilization standards used by provinces, but also because of the type of depletion data currently available from D.B.S. Preferably both methods should be exploited for their values, since each offers peculiar analytical opportunities.

## Land Resources

According to the 1968 National Forest Inventory, 796 million acres or 35% of the total land area of Canada is classified as forest land (Figure 14 and Table 16). This acreage is 12% less than reported in 1963, largely because of a change in terminology and classification whereby the terms productive and nonproductive forest land were revised. Instead, a new term, forest land, was introduced, and part of the nonproductive forest was left to fall into the new "wild land" class. Forest land<sup>13</sup> was given new dimensions, which had meaning for both the timber operator and the ecologist.

This new definition of forest land meets the overriding F.A.O. criteria which dictate that the trees must dominate the vegetative associations. At the same time, the 4-inch minimum diameter requirement and the 10% forest cover indicated a productive capability of approximately 5 cords an acre. This volume approaches the minimum that can be considered economically exploitable.

<sup>12</sup>Finlayson, E. H., interpreting the report of the Pulpwood Commission, 1924.

<sup>13</sup>Land capable of producing stands of trees 4 inches d.b.h. and larger on 10% or more of the area. Shelter belts and units of forest of 5 acres or less and scattered are excluded. This land class does not include agricultural land currently in use, although capable of producing trees as above.

Figure 14. Area classification of Canada 1968

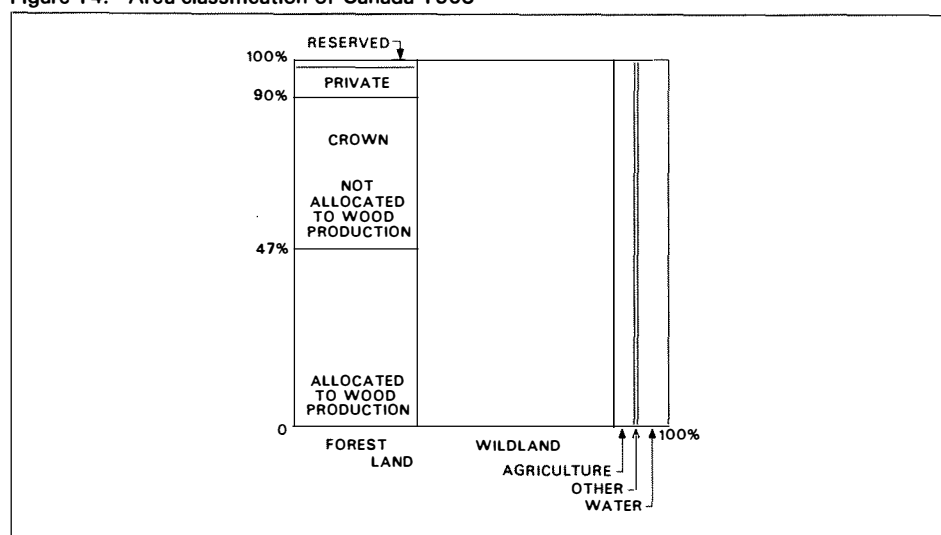


TABLE 16. AREA CLASSIFICATION BY PROVINCES, 1968

	NEWFOUNOLAND LABRA- DOR		PRINCE EDWARD ISLAND	NOVA SCOTIA	NEW BRUNS- WICK	QUEBEC	ONTARIO	MANI- TOBA	SASKAT- CHEWAN	ALBERTA	BRITISH COLUMBIA	NORTH- WEST TERRI- TORIES	YUKON	CANAOA
	thousands of acres													
FOREST LAND														
Suitable for Regular Harvest	13,362	8,628	617	9,615	15,501	121,845	115,471	37,854	21,627	60,127	134,838	21,745	27,063	588,293
Not Suitable for Regular Harvest	8,203	—	—	—	108	49,920	105	54	2,825	2,100	—	102,799	24,905	191,019
Reserved	74	182	7	340	48	62	4,958	561	1,468	6,096	3,238	—	—	17,034
TOTAL FOREST LAND	21,639	8,810	624	9,955	15,657	171,827	120,534	38,469	25,920	68,323	138,076	124,544	51,968	796,346
WILD LAND	43,565	17,222	33	1,562	627	140,186	80,571	79,026	48,823	42,400	85,164	677,656	79,454	1,296,289
AGRICULTURE	—	126	738	1,053	1,138	9,109	17,481	17,871	64,062	47,124	3,771	—	—	162,473
OTHER, urban, etc.	—	95	8	486	278	2,035	1,633	170	2,111	1,385	737	—	—	8,938
TOTAL LAND	65,204	26,253	1,403	13,056	17,700	323,157	220,219	135,536	140,916	159,232	227,748	802,200	131,422	2,264,046
WATER	7,005	1,497	5	655	447	57,553	43,833	25,104	20,172	4,150	6,380	32,938	1,107	200,846
TOTAL LAND AND WATER	72,209	27,750	1,408	13,711	18,147	380,710	264,052	160,640	161,088	163,382	234,128	835,138	132,529	2,464,892

## Forest Land Capability

With improvements in inventories and the cooperation of the provinces, it was found possible to provide a refinement of the forest land category whereby two very general capability classes were introduced—forest land “suitable for regular harvest” and “not suitable”.<sup>14</sup> The latter is estimated to have the growth capacity to meet the minimum tree size and cover of 10%, but the rotation period is extremely long. Quebec has introduced this category into its inventory, and other provinces have recognized sizable areas, particularly Newfoundland (Labrador portion), and federal jurisdictions in the Yukon and Northwest Territories.

Currently 191 million acres, or 24% of the forest land total, are found in this category (Table 16). As new inventories are completed, it is expected that larger acreages will be reported and will result in a reduction in the area suitable for regular production.

The separation of this slow-growing (yet productive of timber) forest permits concentration on lands that have the physical capability of responding to management inputs. Nevertheless, this other forest has economic importance as an emergency timber reservoir with which to counter short-term supply problems resulting from fire or biological disasters. Further, it has a direct long-term influence on supply through its value for recreational use and water production whereby pressures on timber lands for single use have an opportunity for release. The efficacy of placing these lands in the “reserved” category, discussed in the following paragraphs, should be considered seriously. If those forests that are physically capable of contributing to the long-term timber supply

are identified, the long-term supply situation can better be predicted.

## Reservation of Forest Land

Reserved forest land<sup>15</sup> is expanding fairly rapidly and possibly at the expense of timber production. Over the period 1963-1968, the area increased by 10,364,000 acres, from 6,670,000 to 17,034,000 (Table 16). If public pressures and the response by governments to them are any indication, this trend can be expected to continue. Economic timber supplies will be affected unless global planning is introduced that integrates timber and recreational needs, and rational land-use decisions are based on resource capabilities and socioeconomic criteria. In this same context, the careful selection and dedication of areas of “wildland”<sup>16</sup> to recreation would have considerable value. Five hundred and thirty-nine million of the 1,296 million acres of wildland lie within provincial boundaries and could constitute a large part of the true “wilderness” sought after by the enthusiastic few.

Currently it is impossible to predict any trends in the dedication of forest land to single use, particularly to recreation. Political decisions will continue to dominate during this period of unresolved public demand, and any long-term forestry planning will encounter periodic frustrations.

## Agricultural Land-Use Changes

According to the 1968 National Forest Inventory, 162 million acres of land are in agricultural use. Unfortunately no comparable figure was available from the 1963 Inventory to indicate any change over the period. An alternative opportunity to examine change is found in the D.B.S. Census of Agriculture, 1961 and 1968. The

Census reports an increase in the “improved” agricultural land category of 4.75 million acres over the period. In the provinces east of the Prairies, a decrease of 380 thousand acres was more than offset by the increase of 5.15 million acres in the West, mostly in Alberta and Saskatchewan. This trend may have slowed recently because of grain marketing problems, but when the demand for agricultural products revives and additional lands are needed, the main thrust of expansion will be in the Prairie Provinces.

As for the eastern trend, Quebec contributed most of the recent decline with 235,000 acres, followed by New Brunswick with 95,000 acres. Relatively speaking, decline in New Brunswick was sizable at 13% of the total “improved land”, whereas the Quebec decline was only 3%.

In the short term, to the year 2000, these changes will have no effect on supply. Over a longer period the eastern trend towards less farming will have a positive effect on timber supply, which in some areas might be considered “tight” today. In the West, where unused reserves of timber remain large, economic supply should

<sup>14</sup>*Not Suitable for Regular Harvest* — This forest land has an observed or estimated productivity whereby a rotation period of an undetermined length is required to grow a merchantable stand of trees, but ultimately the forest should have harvest possibilities. This class of forest may be considered as an emergency reservoir with no “allowable cut” calculation. With reference to terminology frequently used in inventories, this class would accommodate a portion of the so-called “nonproductive” forest land, the remainder falling into the “wild land” class.

<sup>15</sup>Forest land in parks, game refuges, water conservation areas and nature preserves, where, by legislation, wood production is not primary.

<sup>16</sup>Barren, muskeg, rock, and land with scrub, and land with forest cover substandard to forest land.





remain outside the influence of any expansion of agricultural land even at the expense of forest.

The new government programs of farm enlargement or consolidation have not yet been assessed for their effect on land use. Should the land be returned to the Crown, expanded production can be expected, whereas reforested private land may not improve the supply but may be used primarily for recreation.

Although the timber potential of marginal agricultural lands is usually high, the location of such lands is good, and although incentives are often offered, there is no large-scale reforestation activity. Ontario, where most of the private land reforestation has taken place in past years (71% of the national total), shows no significant increase in annual planting over the average for the 1960-1969 period, despite the introduction over that period of sizable grants covering all planting expenditures except nursery stock purchases. Nature and time, fortunately, will answer the reforestation need.

#### Urban and Other Land Uses

The direct impact of urban development on forestry land is minor compared with that of agriculture, since most large centers of population are on or near the better agricultural land. Currently 8.9 million acres are reported as being used for urban development and other special purposes not related to renewable resource production. Perhaps more important than the actual use of land for structures, roads, and other related urban facilities is the influence of expanding population on forest-land use, which often occurs in areas quite remote from the actual population centers.

Over the past 20 years a trend



towards absentee forest-land ownership seems to have been developing. One study conducted in two counties of southwest Quebec (Jones and Lord, 1969) showed that 23% and 29%, respectively, of the owners did not reside on the land and expressed considerably less interest in timber production than in both recreation and the investment benefits stemming from real estate appreciation. This tendency to rate the other values of forest land higher than timber production could affect the supply for mills close to large population centers.

## Timber Resources

### Volumes by Provinces

Volumes of standing timber are presented in Tables 48 and 49 (in the Appendix). Since national and provincial volume data are aggregated to provide background information for broad policy and planning purposes only, regional and specific industrial implications should be avoided. For example, information in the Inventory might suggest sizable available volumes for a species but the scattered nature of the timber, either within the forest or throughout a province, could make any economic harvest impossible. Thus the standing volumes presented in the tables should be used with care.

In examining Tables 48 and 49, it should be noted that no inventory is available and that therefore no volumes are estimated for 270 million acres of nonreserved forest land. Obviously, for a number of years in the future, this forest will have little influence on economic supply because of its location. Labrador, with 13 million acres of land assumed to be suitable for regular harvest but uninventoried, should perhaps be excluded

from this assumption since this area is now allocated to wood production and is being inventoried. Cutting remains negligible.

It will be noted in Tables 48 and 49 (in the Appendix) that British Columbia reported only volumes from mature timber stands. The 1963 Inventory (D.B.S., 1971b) shows a standing volume of 377 billion cubic feet, 40% more than the 269 billion currently reported. Because of this reduced figure, and the lack of an estimate in this inventory for the Yukon and Northwest Territories, the total national volume is down some 16% from 1963.

Revised or more comprehensive inventories in Quebec and Alberta report significant increases in volumes, Quebec being up 22 billion cubic feet or 20% over 1963, and Alberta up 4½ billion, or 10%. Saskatchewan volumes were lower by 3 billion cubic feet, or 15%, Nova Scotia by 12%. For the Island of Newfoundland a reduction of 40% is reported. This major downward revision reflects the true extent of their inventory coverage, which is considerably less than the total forest land area and the previous estimates of volume. Ontario and Manitoba volumes remained the same, while Prince Edward Island reported a decline of 40%. The reasons behind the drastically revised Prince Edward Island figures have not been clarified.

### Volumes by Species

From Table 48 it can be seen that spruce predominates in Canada with 40% of the coniferous volume and one-third of the total volume for all species. On a provincial basis, only in Newfoundland is it exceeded in volume by any other species and there by balsam fir. In British Columbia a number of different conifers are found

in large volumes, but spruce dominates again with 25% of the total followed closely by hemlock at 23%. As noted earlier, British Columbia data represent mature volumes only.

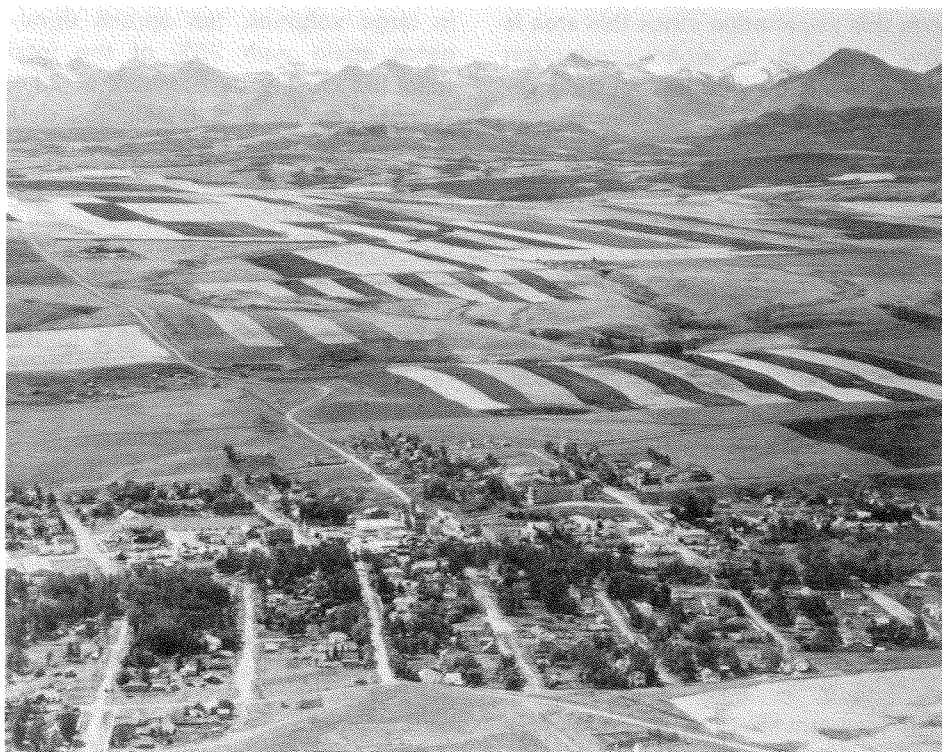
Nationally, poplar dominates the hardwood timber resources with 40% of the total volume. White birch, hard maple, and yellow birch follow in order of volume importance. On the Prairies, poplar provides 98% of the hardwood resources and white birch the remainder. In Quebec, white birch, yellow birch and maple each exceed poplar in volume. In New Brunswick and Nova Scotia the same species, with one addition, beech, each exceed poplar in volume. Ontario has sizable volumes of white birch, hard maple, and yellow birch, but in total they only equal the poplar volume.

Hardwoods alone compose 20% of the total merchantable timber volume reported for Canada; but this figure may be somewhat conservative, since it does not include the private forest lands of Quebec and the Prairies, much of which have hardwood cover and are not inventoried. The multiplicity of species, the scattered nature of the distribution, and the short rotation period of the major component, poplar, all influence supply and perhaps indicate the reason why, with 20% of the volume, hardwoods supply only 5% of the harvest. Several other factors such as form, cull, and wood quality are also reflected in the supply situation, which seems to be "tight". Thus, as stated earlier, the volume data alone should be considered as merely an indication of potential supply.

### Volumes by Maturity Classes

When merchantable timber volumes are broken down into maturity classes,





differences in relative volumes by class appear between provinces, (Table 49, in the Appendix). Spruce is an example. In New Brunswick, apparently continuous and full exploitation has reduced the volume in the mature and overmature classes of this species to only 21% of the total volume. Normally one might expect to find 60% of the total in these classes. This may be partially explained by their data, which indicate a rather high volume per acre for the young growth and immature classes and compensate, to some extent, for the low ratio of mature to young and immature timber volumes. Although their situations are not quite so serious, Alberta and Saskatchewan report 30% and 46%, respectively, of their spruce in these timber classes. It may be that this is more the result of fire than of heavy cutting. This is supported by fire data (Table 50, in the Appendix) for the 5-year period when the annual area of burn in Alberta approached the areas of cutover and, in Saskatchewan, was more than twice that area. In contrast, New Brunswick's cutover area was 10 times larger than the fire area. In summary, the low ratio of mature timber to young and immature volumes is indicative of impending supply problems in spruce for these three provinces.

Also in spruce volumes, Ontario, Quebec and the Island of Newfoundland report 80%, 87% and 98%, respectively, in the mature and overmature classes. This suggests an excess in these classes with possible current losses from overmaturity. As Manitoba, Nova Scotia, and British Columbia did not report any breakdown of volume data to maturity classes, no comments on any species are in order.

Where balsam fir is an important



component of the provincial forests, the distribution of volume by maturity classes is similar to that of spruce. In addition, the combined category of jack and lodgepole pine conformed to the same pattern except in Ontario, where mature volumes account for 60%, thus perhaps giving rise to an ideal situation, rather than the 80% reported for spruce.

The distribution of hardwood volume by maturity classes follows a pattern somewhat similar to that of the conifers. Quebec figures do not include volumes for private forest lands and may be considered slightly conservative. Quebec reported 85% of the total merchantable volume of poplar, yellow birch, white birch, and maple found in the mature classes. Ontario and Saskatchewan also reported significantly larger volumes of poplar and white birch in the mature classes. In addition, Ontario has somewhat more than 70% of its merchantable volume of yellow birch in these classes, but only 50% of its maple, which is about the same as the New Brunswick percentage.

In Alberta, poplar constitutes 40% of the total volume, but only 17% is found in the mature classes. New Brunswick reports 11% of the poplar volume in the mature classes, but there the species is not quite so important, since it constitutes only 4% of the total volume for all species. British Columbia, Manitoba, and Nova Scotia, had no breakdown by classes.

#### Area by Maturity Classes

As a further aid to understanding the condition and state of provincial forests, Table 51 (in the Appendix) provides information on the area of forest in each maturity class and thereby by an understanding of the degree of

forest regulation. Theoretically a fully regulated forest would have an equal area of forest in each age class up to rotation age. Although this type of analysis is better suited to a management unit, an analogy can be found in the management of provincial forests in aggregate.

The maturity classes used in the National Forest Inventory are defined in terms of a stage of growth expressed as a percentage of the rotation period. Since they are of unequal size<sup>17</sup>, a regulated forest would have 20% of the area in young growth and 40% in immature and the remaining 40% in mature and overmature stands. Uneven-aged stands have been included with the mature and overmature for the sake of simplicity.

Making comparisons on this basis, Prince Edward Island, New Brunswick, and Saskatchewan reported abnormally large acreages in the young and immature classes. These acreages confirm similarly large volume imbalances discussed earlier, and suggest that the classes themselves are weighted heavily towards the older stand components—i.e., that sizable areas are close to the top of the immature class and will soon move into the mature class. If this is true, they would contribute considerably to the improvement of a supply situation that does not seem very strong at the moment.

Although unable to break down their volumes to maturity classes, British Columbia, Manitoba, and Nova Scotia did provide some data on areas by such classes. In Nova Scotia and, to a lesser extent, in Newfoundland and British Columbia, areas of mature and overmature timber overbalance the younger classes and suggest major opportunities to increase the annual cutover area without depleting

the resource. Quebec and Ontario show smaller surpluses in the older classes while Manitoba, with only limited new inventory information yet processed, seems to be in a balanced situation.

In examining these figures for timber volumes and area, it should be stressed that they apply to the inventoried or estimated portions of the nonreserved forest land only, or 506,866,000 acres. Another 272,446,000 acres of nonreserved forest land have not been considered in this discussion. The regions where these uninventoried lands are located can be found by comparing Tables 50 and 51 (in the Appendix). The Northwest Territories and the Yukon account for 176,512,000 acres. The remaining 96 million acres are distributed as follows: Labrador 21 million; the Island of Newfoundland 3 million; Quebec 18 million; Ontario 10 million; Saskatchewan 6 million; Alberta 22 million; and British Columbia 12 million. Minor areas are distributed among the other four provinces.

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<sup>17</sup>*Rotation Period* — The growth period between forest establishment and final harvest. It will reflect regional factors both physical and economic and may vary within a species as well as between species. The use of a percentage of the rotation age to define maturity classes, in lieu of age, permits a simple aggregation and more meaningful analysis of area data in relation to the usefulness of standing timber.

*Young Growth* — Less than 20% of rotation period with trees generally unmerchantable and having a volume of less than 5 cords per acre of all species.

*Immature* — Between 20% and 60% of rotation period with trees generally merchantable and having a volume ranging from 5 cords or more per acre to trees suitable for saw-timber.

*Mature* — Between 60% and 100% of rotation period with trees approaching maturity or ready for final harvest.

*Overmature* — Trees generally beyond rotation period.

TABLE 17. TENURE AND STATE OF NONRESERVED FOREST LAND, 1968

	NEWFOUNDLAND LABRA- DOR	ISLAND	PRINCE EDWARD ISLAND	NOVA SCOTIA	NEW BRUNS- WICK	QUEBEC	ONTARIO	MANI- TOBA	SASKAT- CHEWAN	ALBERTA	BRITISH COLUMBIA	NORTH- WEST TERRI- TORIES	YUKON	CANADA
thousands of acres														
<b>CROWN-PROVINCIAL</b>														
Allocated to Wood Production														
Stocked	21,565	3,029	5	1,505	6,754	55,630	91,723	16,355	5,871	34,509	88,299	—	—	325,245
Inadequately Stocked	—	—	1	495	375	10,257	1,205	10,880	766	11,054	7,222	—	—	42,255
Not Allocated to Wood Production														
Stocked	—	—	—	—	—	87,218	10,058	4,020	7,735	7,230	28,054	—	—	144,315
Inadequately Stocked	—	—	—	—	—	598	—	2,680	8,754	7,035	4,355	—	—	23,422
Subtotal	21,565	3,029	6	2,000	7,129	153,703	102,986	33,935	23,126	59,828	127,930	—	—	535,237
<b>CROWN-FEDERAL</b>														
Allocated to Wood Production														
Stocked	—	—	1	17	234	155	680	204	379	300	400	—	51	2,421
Inadequately Stocked	—	—	—	4	72	39	370	—	—	140	100	—	—	725
Not Allocated to Wood Production														
Stocked	—	—	—	—	21	—	77	66	—	100	—	124,303	51,798	176,365
Inadequately Stocked	—	—	—	—	—	—	—	—	—	—	—	241	119	360
Subtotal	—	—	1	21	327	194	1,127	270	379	540	500	124,544	51,968	179,871
<b>PRIVATE</b>														
Stocked	—	5,499	610	5,713	7,617	16,596	8,463	1,814	947	1,859	5,627	—	—	54,745
Inadequately Stocked	—	100	—	1,881	536	1,272	3,000	1,889	—	—	781	—	—	9,459
Subtotal	—	5,599	610	7,594	8,153	17,868	11,463	3,703	947	1,859	6,408	—	—	64,204
<b>TOTAL NON-RESERVED</b>														
FOREST LAND	21,565	8,628	617	9,615	15,609	171,765	115,576	37,908	24,452	62,227	134,838	124,544	51,968	779,312

## Production Limitations

Area and timber volumes are but two dimensions of the forest resource supply. Others, which affect resource utility, are land tenure, access, capability, management, and land use. Unfortunately provincial and national data aggregations tend to obscure local shortages of specific products but the new data format does permit some refinements in analysis, particularly several collections. For these reasons, only a few analyses of the influence of these factors on supply are possible.

### Tenure

The National Forest Inventory divided forest land into three ownerships—federal Crown, provincial Crown, and private. In the 5-year period from 1964 to 1968, the average acreage of private forest land cutover annually was six-tenths of 1%, whereas something less than four-tenths of 1% of the Crown land "allocated to wood production"<sup>18</sup> was cutover annually (Table 50, in the Appendix). Two factors—location with respect to markets and land capability—probably account for the differences. The first encourages utilization; the second shortens the merchantable rotation.

Currently, federal forest land has little or no impact on the supply situation. It is usually remote from major utilization centers because of a policy of transferring lands to the province whenever the province is prepared to assume administrative and development responsibilities or when political development is sufficiently advanced. Thus the federal lands are neither subjected to extensive forest exploitation nor justify any major global inventory. Currently only 3 million acres out of a total of 179,871,000 acres of nonreserved forest land

are "allocated to wood production". Since much of this forest land is in the transitional zone between forest and barrens, growth is slow. Estimates suggest that 70% of the forests of the Yukon and Northwest Territories may be in the class "unsuitable for regular harvest".

Provincial forest land constitutes 70% of the national total of non-reserved forest. It is interesting to note that out of this provincial total 535 million acres, only 368 million have been allocated to wood production. As above, much of this unused timber potential is found farther north, remote from utilization centres; and 64 million acres are reported as unsuitable for regular harvest. Between provinces there are variations in the relative areas of unallocated forest lands, with only those of the Atlantic Provinces being fully allocated. The other provinces range from 70% unallocated in Saskatchewan to 10% in Ontario (Table 17).

Projections based on previous trends have not been possible because of several changes in the categories of land and its use. The new definitions were introduced to satisfy the primary objective of breaking down the forest land into use categories—i.e. of indicating the extent of forest land dedicated to wood production and the extent not thus dedicated—in other words, the objective of showing the potential for industry expansion. Nevertheless, should a reader note the small "occupied" area of 140 million acres reported in the Canadian Forestry Statistics for 1963 and compare this with the current figure it would appear that a major new dedication of forest land to industry use has taken place. The previous figure did not include lands from which a quota of timber was being supplied, but only those under

license or lease, and was therefore misleading. The 1968 Inventory brought these two figures together, as did the report *Timber Trends and Prospects in Canada* (F.E.R.I., 1965).

That report stated that 406,608,000 acres of forest land constituted the national timber-drainage area. For 1968 a comparable figure, including the private forest land to be in timber production, would be 434,850,000 acres. This increase amounts to 7%, whereas over the same period wood production increased by almost 10%. This suggests that the utilization of the allocated areas is greater.

### Access

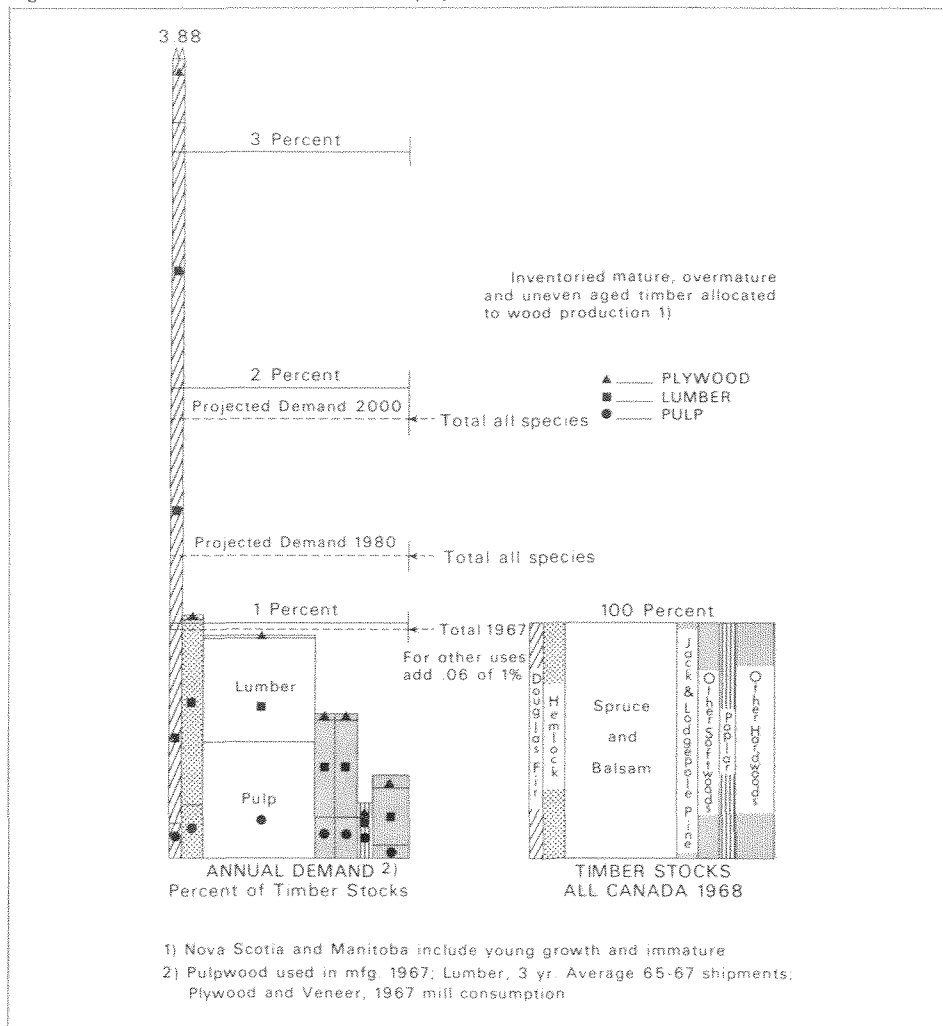
The locations both of timber with respect to the mill and of the mill with respect to the market are the most important factors influencing supply. The only possible indication of current provincial supply constraints and one which may extend into the future, is the underutilization of the now available and allocated timber stocks. In addition, the 168 million acres not yet allocated to wood production must be faced with some limitations of access but, until the gap between the allowable cut and the actual cut on the lands now allocated to production is closed, access and its influence on the national timber supply are matters of pure speculation.

### Other Limiting Factors

Although the capability of forest land has already been discussed in general terms, more specific reference should be made to the need to compile land-capability information that indi-

<sup>18</sup>Allocated to Wood Production — Forest land, licensed, leased and/or under sustained yield management and currently committed primarily to wood production.

Figure 15. Timber stocks and demand by species



cates something more than just natural growth capability should be stressed. How will each site respond to different levels of management? Since this one aspect of supply, the quality and quantity of timber than can be produced at a location in a given time, is lacking, this report leaves much to be desired.

Another factor affecting supply comes, not just from the reservation of forest land for recreation, as noted earlier, but from the added costs introduced into wood production by "environmental forestry". Should the costs associated with the maintenance of environmental quality be assumed by the user—i.e., the viewer—the impact on supply would be minimal. The sharing of administrative, protection, and access costs would permit greater silvicultural inputs and yet maintain wood costs. The net result would be to increase production and improve utilization.

## Forest Depletion

Depletion, unless measured against a finite quantity, has no meaning with respect to supply. Similarly, a supply curve cannot be drawn without information on the cost of additional units of production. Always presented in terms of volume, and measured against timber stocks, often in heavy surplus, with unknown growth rates, questionable quality and unlocated with respect to markets, depletion has had no meaning with respect to supply, and no regional or national supply curves could be derived. Certainly these curves could be drawn for individual operations, although without every factor introduced, but they were adequate for simple decisions. Over the years, the regional and national data have seen only minor improvement.



In an effort to rectify this weakness a new approach was taken in the 1968 Inventory. The area depleted of forest cover was measured against a finite area of forest land. Although no supply curves were possible, this approach gave a new understanding of the harvest in relation to the forest as a whole. In parallel and with the same base for refinements, the relation between simple capability, current use, and current forest cover was established. In the following sections an attempt is made to interpret depletion, with respect first to volume and secondly to area.

### Current Forest Production

Production figures from 1945 to 1968 are provided in Table 52 (in the Appendix). Demand, as noted earlier is expected to rise from the 1968 production level of 3.973 billion to 7.62 billion cubic feet by the year 2000. Most of the current harvest is coming from only 435 million acres, either privately held or Crown land allocated to wood production. Of this acreage, only 380 million have been inventoried, and their allowable cut is calculated at 8.481 billion cubic feet annually (Table 53, in the Appendix).

This apparent surplus, at least from the inventoried area, may not be useable because of location, quality, or form. Thus it is quite possible shortages may be encountered in the year 2000 unless some timber is utilized from the currently noninventoried but "allocated" area. These figures do not take into account the 344 million acres of nonallocated forest land.

### Species Utilization

To arrive at the relative level of species utilization across Canada, several different forms of D.B.S. data were aggregated and minor variations in the

time periods introduced. Despite these problems and the fact that their aggregation did not permit the identification of all species, one analysis is particularly interesting. The current use of species is examined in relation to the mature timber stocks growing on "allocated forest land". Figure 15 shows the relative volumes of the major species or of combinations of species for all Canada, together with the annual demand, expressed as a percentage of the total volume.

Douglas-fir is used most heavily, at an annual rate of approximately 3.88% of the mature volume. Access, wood quality, and markets are the main factors that contribute to this high level of utilization, primarily for lumber. Hemlock follows at slightly more than 1% a year, lumber again predominating although one-fourth went to pulpwood. It should be noted that these data do not include mill residues. Poplar is the least used species at less than one-fourth of 1%, followed by hardwoods at approximately one-third of 1%. Spruce and balsam are combined and estimated at nine-tenths of 1%. Currently more than 60% of the poplar and 50% of the spruce and balsam are used by the pulp and paper industry.

Although Figure 15 compares only the mature inventory volumes and ignores growth rates, it is obvious that species utilization must be adjusted to the existing timber stocks. Otherwise supply will be "tight" within a few years. Surely there also exists justification for heavy utilization of some species. Hemlock and Douglas-fir, the two most heavily used species, come primarily from British Columbia, where mature timber stands occupy half the provincial forest land (Table 51). This suggests that there is an imbalance of age classes, with a surplus of mature and overmature timber. The same im-

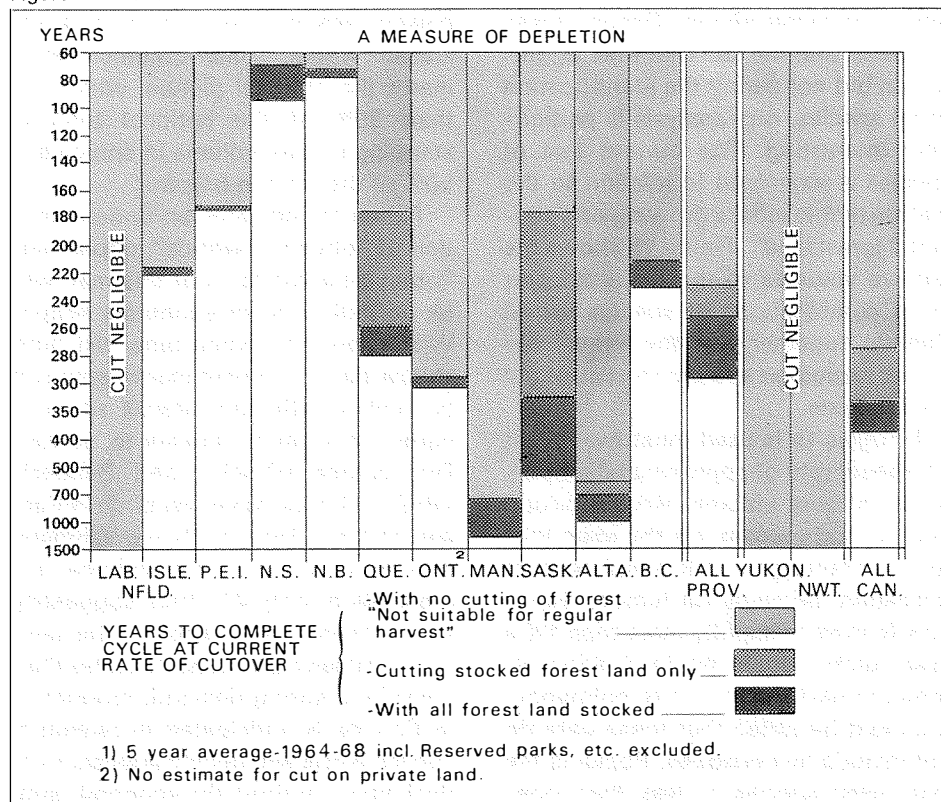
balance seems to apply to spruce and balsam. Again, British Columbia dominates the national picture, with more than 30% of the national total of standing mature volume in spruce and 50% of the total in balsam.

Figure 15 indicates an underutilization of "other softwoods", poplar, and "other hardwoods", but this may well be an indication of economic supply. With respect to white pine, red pine, yellow birch, and hard maple, supply is particularly difficult to assess, although current utilization appears to be low. One source (Quigley and Babcock, 1969), referring to yellow birch in Canada and the United States, estimates growth at 2½% of the volume and removals at only 2%, thus suggesting an improving timber supply. The same report, speaking of Canada, states that: "despite a strong demand, production in Canada is anticipated to remain at current levels and quality appears to be declining". In short, the economic supply situation is deteriorating. Unfortunately, the available statistics give little opportunity for further analysis of the actual supply situation for these species, some of which have been "mainstays" of the lumber and plywood industry in eastern Canada.

### Area of Forest Depleted to Satisfy Demands

Over the period 1964-1968, 2,040,000 acres were depleted annually to produce an average of 3.78 billion cubic feet of wood. In the inventoried forest only, this would be the equivalent of an annual cut of one acre in 250, which would produce an average of 1,850 cubic feet of wood (Table 54, in the Appendix). If it is assumed that the current economic supply area should include only the forest areas "allocated to wood production", to-



Figure 16. Total forest land area vs annual cutover area<sup>1</sup>

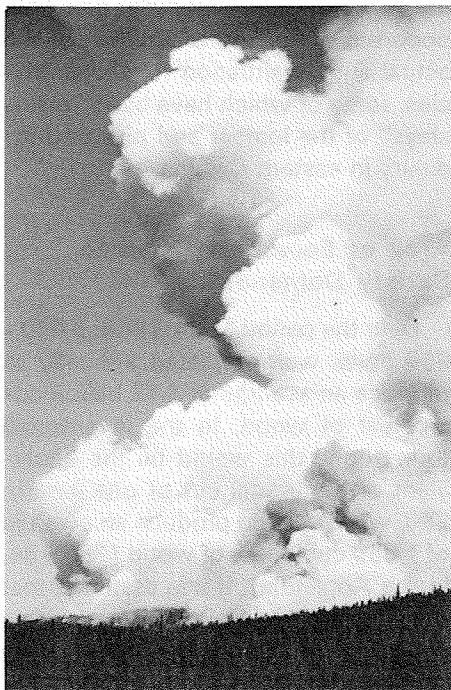
gether with private forest lands, which form a smaller area, the annual cut would be one acre in 211 (Figure 16).

New Brunswick and Nova Scotia are the most heavily harvested provinces with a cutting cycle in the former of 70 years and in the latter of 96 years. On the assumption of a normal rotation period anywhere between 60 and 100 years, these two provinces are faced with a rising supply curve unless increased utilization or improved silviculture are possible without an increase in the cost of stumpage and production, but such a situation is unlikely.

### Forest Land Inadequately Stocked<sup>19</sup>

Table 17 shows a Canadian total of 77 million acres of inadequately stocked forest land. Of these acres 55 million are found on the Prairies and in British Columbia, but their lack of growing stock does not currently affect supply in a global sense because of extensive stands of underutilized forest in the same areas. In Nova Scotia and New Brunswick 24% and 6%, respectively, of the forest land are reported as understocked. These percentages are sizable and probably affect economic supply because of the almost complete utilization of the current natural-growth capacity. The fact that three-quarters of the inadequately stocked land in Nova Scotia and 55% of that in New Brunswick are privately held introduces additional problems for industry or governments in the stimulation of production.

<sup>19</sup>Stocked — Supporting tree cover of sufficient density to produce an acceptable volume at the end of a rotation. Stocking standards for economic wood production vary according to markets, species, age, location, etc., and since these are regional in nature, the definition of regional standards is at the discretion of the province.



In summary, unless Nova Scotia and New Brunswick can find methods of economically increasing their production through the full use of forest land, the western provinces, and to a lesser extent, Ontario and Quebec, will take the major share of the projected new demand. In the West the backlog of unregenerated lands may decline as better protection takes effect.

### Fire Losses

Statistics on forest-fire losses, control and prevention costs, and area of forest by class burned have been collected for many years;<sup>20</sup> but for the purpose of construction of a supply curve they, like other depletion data, have not been provided with a satisfactory economic framework. In the 1968 Inventory, fire was given a slightly new dimension (Table 50, in the Appendix). Fires were located with respect to forest land either "allocated to wood protection" or "not allocated". The objective was to narrow the resource base of the economic supply of wood and to provide better understanding of the potential returns for any protection and control measures instituted. The effect of fire on long-term timber availability could be either positive or negative, depending on the distribution of the forest to the various age classes and the particular age class burned. For example, where considerable forest area is mature or overmature, fire in such timber could be quite beneficial, even from the standpoint of ecology, if it is assumed that variety is desirable. However, until the other factors of production are introduced, the supply curve remains a matter of speculation.

The 5-year (1964-1968) annual average fire area on *private* forest land, expressed as a percentage of the total, was 0.063 of 1%. The figure for provincial Crown forest lands allocated to

wood production was more than twice as high at 0.141 of 1%. In total, these percentages represent 564,000 acres, or an area equal to almost one-third of the annual cutover. With forests fully regulated and under a cutting cycle of 100 years, random fire occurrence at this level could theoretically reduce the total harvest potential by one-sixth. The fire areas reported for Crown lands "not allocated to wood production" 0.064 of 1%. It has been suggested that this figure may be conservative because of limited reporting facilities in these more remote forest areas.

Finally, in examining the foregoing data, it should be pointed out that, because of large variations from year to year, a compilation for a single 5-year period does not adequately represent the fire incidence. The reason for the initiation of the shorter period for the 1968 Inventory was to collect fire data comparable with the cutover data, which were for the 5-year period. Thus there is some value in looking at the incidence of fire over the last 10-year interval.

In that period, from 1959 to 1968, inclusive, the annual average fire area was 1,026,000 acres, not including nonforested lands.<sup>21</sup> This could be compared with the 802,000 acres annually burned in the 1964-1968 period. The year 1961 saw disastrous fires in both Newfoundland and the western provinces. Those fires alone equalled almost half the 10-year total.

### Insect and Disease Losses

The losses from insects and disease are classified as either endemic or epidemic and are quite different in their real effect on volume production. Endemic losses may either slow the rate of growth of a stand or result in selective mortality essential to stand development. Epidemic losses tend to

be more catastrophic in nature. Where extensive mortality occurs from attacks of insects such as the spruce bark beetle or the hemlock looper, the losses are comparable to those of fire or cutting and the methods of their measurement, and the data required for analysis, are the same. In the case of the bark beetle, it has been estimated that in British Columbia the average annual volume killed over the period 1961-1965, inclusive, was 100 million cubic feet. Fortunately, it has been possible to salvage much of this volume because the beetle tends to concentrate its attack on mature and overmature timber ready for harvest, but as in the case of all salvage operations, there is an added cost of production.

There is one manifestation of endemic loss that is somewhat unusual and relegates a stand to a permanent nonmerchantable condition. The annual attacks of the balsam woolly aphid place certain Maritime timber stands in the "unsuitable for regular harvest" category. These areas have not, as yet, been defined.

Of all the disease and insect losses suffered over the years, only three can be pointed out as having a measurable influence on the supply curves for a species. The loss caused by chestnut blight made the chestnut tree virtually extinct, and Dutch elm disease may achieve a similar result. Finally, white pine blister rust and white pine weevil are undoubtedly shifting and shaping the supply curve, but the total loss cannot be said to effect or alter the national supply curve for all species. Of course, individual forest industries

<sup>20</sup>Lockman, M. R., *Forest Fire Losses in Canada (Annual)*. Canadian Forestry Service. Various issues.

<sup>21</sup>Lockman, M. R., *Op. cit.*

and their supply curves have been affected by insect and disease losses but the losses await measurement from the economic standpoint.

### Factors Influencing Utilization

Four interrelated factors have a major influence on the utilization of any given stand of timber: logging technology, manufacturing technology, economics and legislation. Although manufacturing technology indirectly influences economic supply, there is little point in any attempt at analysis since the overall resource information lacks the necessary sophistication. A few brief comments on the other factors are in order.

#### Logging Technology

New logging systems have both the physical and economic capability of increasing utilization of the forest. Through the use of power saws and the introduction of hydraulically operated shears for felling trees, stump heights have steadily decreased. In addition mechanization of limbing has permitted the economic use of smaller top diameters. With respect to stand volume, a critical factor with labor-intensive methods, more stands of low volume can be economically logged with mechanized systems. In the same context, the result of tree-length and full-tree logging is that more of a tree ends up on a skidway than might otherwise be the case. The parts of marginal size can be removed economically if attached to larger pieces. Unfortunately, some defective stems are delivered to the mill under this system that would have been left behind in the forest under labor-intensive logging methods.

According to the most recent survey, 78% of limit pulpwood in eastern

Canada is produced in tree lengths, 20% as shortwood (4-foot and 8-foot bolts) and 2% as full tree. Thus, there remain opportunities for industry to further improve utilization through mechanization, particularly in the area of private land production where new techniques and equipment are slow to be introduced.

There is a distinct possibility that terrain may become a factor in limiting forest land utilization. Although this has been the case with some machines used in harvesting, it is believed that this constraint can be overcome. As an example, today articulated rubber-tired forest tractors are operated on slopes up to 60%; when they were first introduced, the maximum slopes considered operable were 30% or less. It has been suggested that the real limitation of terrain will be encountered in silviculture. Artificial regeneration and restrictions on the use of chemicals will influence the economics of treating rough and broken terrain.

In summary, logging technology has a positive influence on utilization from the standpoint both of physical capability and economic capability, and further improvements can be anticipated.

#### Economics

The need to introduce a specific item on economics under the general heading of utilization may seem redundant, but a clear economic understanding of the production system may have unexpected influence on utilization. The discussion here extends beyond the utilization of the tree or the timber stand to the total forest base. It stems from the frequently heard comment that "economics should no longer dictate natural resource use and exploitation practices". This may be partially true, but economic inputs must be considered at

the outset of any planning program if sound land-use decisions are to be forthcoming. This input should define the relative economic value of forest land with respect to existing or projected primary timber utilization centers. Land transfers to other uses, particularly competing recreation, would be simplified and the optimum timber-supply schedule, from the reduced land base, could be realized. Indirectly, this optimum land base would also encourage optimum utilization of timber capabilities on these lands.

Within such a land use planning system the opportunities for better land and timber utilization are numerous. Industry stability, investment and efficiency could be improved, all of which influences utilization. The alternative is to accept *ad hoc* decisions based on political expediency with no assurance of a long-term supply and unsatisfactory utilization of both the forest and the land capability.

Another economic question is the desirability of utilizing the allowable cut of 10.731 billion cubic feet available from the "inventoried" forest land of Canada. Currently industry has seen fit to utilize only 3.9 billion cubic feet and this from the "allocated" portion of the inventoried land with an allowable cut of 8.48 billion cubic feet. Despite industrial incentives and available timber, Canada already is sharing an ever-smaller portion of the expanding world markets. Part of the answer is undoubtedly related to the resource, particularly its location. Transportation costs in eastern Canada are particularly high. On the Prairies the manufacturing units are remote from international markets and have high transportation costs. In short, any new industries or expansion of capacity will encounter still higher wood costs, and a point of balance must at some time be reached

between size of plant and size of woodshed.

On the positive side, the concentration and growth of production facilities through vertical and horizontal integration does provide for better utilization of various wood qualities and species. Statistics show the number of sawmills at a maximum in 1952, with 8,283 mills reporting, but by 1968 the total had dropped to 1,894. During the period, production rose from 6.8 billion board feet to almost 11 billion. In short, mills are fewer and much larger. For the same period the number of pulp and paper mills increased by only nine, from 128 to 137, roundwood use rising from 1.25 billion to 1.37 billion cubic feet. Likewise, wood-residue use rose from a negligible volume to 0.68 billion cubic feet. This trend should continue until most industries are associated with major "Central Places" and share the benefits of improved social amenities and lower-cost infrastructures. It will be primarily on this basis that hope of achieving the optimum economic utilization will rest.

#### Legislation

Legislation for improved utilization faces almost the same economic constraints as are encountered in any attempt to increase production but its application may not have the same rationale. There are two main aspects of legislation that interact: stumpage rates and specific utilization requirements. Close utilization, within geographical and quantitative limits, can be assisted by low stumpage rates or by differentials in rates for various sections of the same tree. The former is practical only so long as the stumpage rates have no relation to the cost of growing wood, as is generally the case across Canada today. One obvious re-

action to lowering stumpage rates would be a gradual decline in production from all privately held small forest units since little economic incentive for growing timber would exist, if any does in fact, exist today.

Since Crown rates are low in comparison with actual timber-growing costs, it must be concluded that stumpage rates offer very little leverage for increased utilization. Despite this, rates do vary between and within provinces, and the rationale for the differences is not always clear. British Columbia is one province that has moved positively in this matter by introducing reduced rates for additional material harvested under the province's close utilization program. Ontario has, under various circumstances, adjusted rates in recognition of increased harvesting costs.

With respect to legislating for individual tree utilization, minimum size standards usually coincide with current economic limits and, as such, offer little opportunity for early increases in supply. Further, if an attempt is made to remove more of the tree in the form of needles and twigs than is the current practice in the full-tree logging systems, growth rates will suffer unless nutrients are replaced.

A reversal of the trend towards optimum exploitation is now well under way. Legislation to control cutting adjacent to waterways is most common, but another aspect, environmental forestry, is something new. Currently it finds expression outside the realm of operational forestry but will extend its influence, probably through legislation, to all forests exposed to public view. Selective cutting, with its attendant modifications to forest composition, will change supply in terms of cost and product; but the overall effect on timber availability may not be significant.

Legislation to ensure immediate regeneration after the cutting can easily increase the available timber volumes by several percent. If supplies are short and the structure of the forest and product characteristics will permit cutting trees of smaller diameters, an immediate increase in the allowable cut is possible; and the practice has solid economic justification. Any legislation for economic development that provides incentives may encourage programs of reforestation and better land utilization, thereby increasing availability and supply, although possibly at the expense of other sectors of the economy. Such an approach to improved land utilization has many questionable economic aspects and should be considered carefully.

Briefly, new legislation may have either a positive or a negative effect on supply. It cannot be expected to significantly increase the utilization of the individual tree unless prior economic justification exists but may well be of a negative nature and, instead, reduce the acreage or volume of timber available for harvest.

## Summary

At the national level of data aggregation no physical shortage of wood fibre is indicated. On a regional basis there is considerable variation in availability from almost full utilization of natural capability to vast surpluses. Within a specific procurement area or with respect to species and qualities of timber, shortages no doubt exist and adjustments by industry to the resource are continual. Whether the tempo is greater today than yesterday is unknown.

Although the information offers only a broad sketch of the supply situation, it does indicate some important limiting factors as well as opportunities. The forest resource is extensive and, although large areas lie beyond existing transport systems, accessibility is improving and much will soon come within the sphere of economic exploitation.

Utilization is improving through harvesting technology but the major opportunity for improvement seems to lie in the area of manufacturing technology. If the large surplus of poplar and other hardwoods already within the areas of forest allocated to industry were used in manufacturing, a considerable portion of the projected demand could be met without opening up new forest areas and their attendant costs.

In the same context, these new forest areas offer excellent planning opportunities for both timber production and other uses associated with environmental appreciation. If adequate economic resource data are collected and development of the multiple values are timed to needs, ready compatibility of supply and demand is possible by the year 2000. This same type of data could permit the intelligent assessment of opportunities for cultural and management activities

to increase growth on all forest lands. Adequate evidence is available of serious problems in forest development stemming from inadequate resource data and planning.

Inadequately stocked lands constitute more than 10% of the allocated forest land and fire burns over an area equal to one-third of the area cut each year. These current limitations can be looked upon as opportunities for increased production but indiscriminate application of more intensive forest management to achieve this end should be avoided.

In brief, the forest lands of Canada are adequate to meet any of the projected demands over the next 30 years but economic supplies may not be available unless industrial and land use planning, based on improved data are positively undertaken.

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## Appendix

TABLE 18. CANADIAN ECONOMIC INDICATORS

Year	Gross National Product <sup>a</sup>	Personal Disposable Income <sup>a</sup>	GNP/Cap	POI/Cap	Population <sup>b</sup>	Housing Starts <sup>c</sup>	Price Index Wood <sup>d</sup>	Price Index Residential Lumber <sup>d</sup>	Price Index Residential Brick <sup>d</sup>	Price Index Residential Cement <sup>d</sup>	Index of Output/Employee <sup>e</sup>
	billion 1957 \$	billion 1957 \$	1957 \$	1957 \$	million	thousand	1957=100	1957=100	1957=100	1957=100	1961=100
1950	23.114	16.361	1685.68	1193.19	13.712	92.531	86.3	84.1	73.2	85.5	69.1
1951	24.531	17.280	1751.09	1233.49	14.009	68.579	98.7	102.4	80.7	91.7	70.8
1952	26.514	17.838	1833.74	1233.70	14.459	83.246	97.2	100.1	87.3	97.3	71.6
1953	27.525	18.751	1854.16	1263.12	14.845	102.409	96.4	98.9	92.0	98.8	74.4
1954	26.714	18.333	1747.50	1199.25	15.287	113.527	95.8	96.5	92.7	98.5	76.0
1955	29.018	19.574	1848.52	1246.91	15.698	138.276	98.8	98.6	93.6	97.3	81.3
1956	31.508	20.742	1959.33	1289.85	16.081	127.311	101.4	101.2	97.8	97.3	85.4
1957	31.909	21.274	1921.07	1280.79	16.610	122.340	100.0	100.0	100.0	100.0	84.8
1958	32.284	22.467	1890.16	1315.40	17.080	164.632	99.7	98.7	100.4	102.1	87.5
1959	33.398	22.874	1910.31	1308.36	17.483	141.345	101.5	101.4	101.8	100.0	92.9
1960	34.144	23.477	1910.69	1313.77	17.870	108.858	101.5	100.2	102.5	100.7	95.7
1961	35.023	24.000	1920.33	1815.93	18.238	125.577	101.9	99.3	97.8	99.6	100.0
1962	37.195	25.100	2001.56	1350.70	18.583	130.095	105.5	101.2	96.9	99.6	107.6
1963	39.349	26.000	2078.55	1373.41	18.931	148.624	108.0	105.2	101.3	103.3	112.1
1964	41.876	26.800	2170.86	1389.32	19.290	165.658	110.5	113.7	105.5	108.0	117.4
1965	44.739	27.400	2277.49	1394.83	19.644	166.565	111.6	119.4	110.1	109.4	121.8
1966	47.396	28.264	2368.02	1412.14	20.229	134.474	112.8	121.5	111.5	112.9	124.8

<sup>a</sup>Source: Canada Year Book, various issues. NOTE: The GNP and PDI series are as defined prior to August 1969. No substantial change in the results of this report would have occurred if the newly defined series had been used.

<sup>b</sup>Source: Estimated Population of Canada by Province at June 1, 1969. D.B.S. Cat. No. 91-201.

<sup>c</sup>Source: New Residential Construction. D.B.S. Cat. No. 64-002.

<sup>d</sup>Source: Prices and Price Indexes. D.B.S. Cat. No. 62-002.

<sup>e</sup>Source: Canada Year Book, 1969, Page 1108—Output per person employed in manufacturing.

TABLE 19. PRODUCTION OF PRIMARY WOOD PRODUCTS

Year	Fuelwood <sup>a</sup>	Round Mine Timbers <sup>a</sup>	Flatted Mine Timbers <sup>a</sup>	Poles and Pilings <sup>a</sup>	Fence Posts <sup>a</sup>	Fence Rails <sup>a</sup>	Hewn Railway Ties <sup>a</sup>	Sawn Railway Ties <sup>b</sup>	All Railway Ties	Wood for Charcoal <sup>a</sup>	Misc. Roundwood <sup>a</sup>
	M cords					M pieces				M feet <sup>8</sup>	
1950	5,081	171	709	1,376	10,013	1,925	478	4,637	5,115	3,622	3,196
1951	4,817	314	805	1,446	9,792	1,898	536	6,019	6,555	3,382	3,049
1952	4,485	530	947	1,908	10,719	1,981	638	9,407	10,045	3,216	4,539
1953	4,281	256	818	1,562	9,711	1,922	533	7,553	8,086	2,743	3,558
1954	3,918	247	887	1,334	9,183	1,963	325	4,665	4,990	2,990	2,691
1955	3,623	199	763	1,345	8,922	1,714	371	4,491	4,862	2,770	3,415
1956	3,622	208	878	1,617	9,006	1,826	388	5,636	6,024	3,343	1,090
1957	3,563	173	1,159	1,673	9,365	2,206	385	7,160	7,545	3,324	897
1958	3,273	122	708	1,121	9,359	1,851	212	4,983	5,195	2,904	1,248
1959	3,116	102	261	975	10,443	1,410	146	3,462	3,608	2,920	4,382
1960	3,004	102	344	1,258	12,379	1,038	113	3,117	3,230	3,149	3,938
1961	2,994	77	695	1,655	10,454	769	27	2,181	2,208	3,100	15,527
1962	2,816	67	923	1,726	13,482	894	0.9	2,524	2,525	3,160	16,876
1963	2,616	65	570	1,263	18,798	728	0	1,471	1,471	3,680	14,215
1964	2,434	64	641	1,337	18,658	789	0	2,253	2,253	3,360	7,982
1965	2,263	57	749	1,192	19,277	912	0	2,917	2,917	3,360	11,680
1966	2,144	66	760	1,530	19,513	882	0	3,275	3,275	2,925	18,938
1967	2,106	57	791	1,147	21,088	1,547	0	3,272	3,272	2,320	12,245
1968	2,066	49	863	704	17,592	689	0	2,977	2,977	2,080	8,034

<sup>a</sup>Source: Logging, D.B.S. Cat. No. 25-201.

<sup>b</sup>Source: Sawmills, D.B.S. Cat. No. 34-204.

Note: Poles and Pilings from M cu. ft. to number ÷ 15; Flatted Mine Timbers 27.7 fbm/piece.

TABLE 20. PRODUCTION<sup>a</sup> OF SECONDARY WOOD PRODUCTS

Year	Softwood Lumber <sup>b</sup>	Hardwood Lumber <sup>b</sup>	All Lumber	Softwood Veneer <sup>c</sup> *	Hardwood Veneer <sup>c</sup>	All Veneer	Softwood Plywood <sup>c</sup>	Hardwood Plywood <sup>c</sup>	All Plywood <sup>c</sup>	Hardwood Flooring <sup>d</sup>	Shingles and Shakes <sup>b</sup>	Misc. Sawn Material <sup>b</sup>
	million bd ft			million ft <sup>2</sup> (1/10" basis)			million ft <sup>2</sup> (1/4" basis)			million bd ft	M squares	million bd ft
1950	6,107	447	6,554	195	181	376	389	96	485	77	3,192	114
1951	6,430	518	6,949	331	220	551	483	101	584	75	2,982	111
1952	6,298	510	6,808	186	227	413	464	131	595	53	2,425	93
1953	6,781	524	7,306	265	312	578	629	150	779	66	2,610	87
1954	6,817	427	7,244	214	281	495	725	164	889	68	2,711	75
1955	7,547	374	7,920	319	325	643	956	204	1,160	76	2,896	79
1956	7,279	460	7,740	1,094	206	1,300	1,084	221	1,305	78	2,799	77
1957	6,653	446	7,100	549	183	732	1,032	225	1,257	68	2,258	76
1958	6,800	379	7,179	580	203	783	1,278	254	1,532	74	2,324	69
1959	7,196	395	7,591	564	253	817	1,232	300	1,532	72	2,210	65
1960	7,570	443	8,012	487	220	707	1,382	257	1,639	61	2,344	66
1961	7,807	430	8,237	477	224	701	1,628	274	1,902	63	2,290	57
1962	8,410	419	8,829	628	292	920	1,740	322	2,062	66	2,509	56
1963	9,410	468	9,877	791	316	1,107	2,083	364	2,447	66	2,880	52
1964	9,829	527	10,356	547	318	865	2,213	372	2,585	78	2,666	53
1965	10,290	525	10,815	1,020	354	1,374	2,334	385	2,719	81	2,612	51
1966	10,026	573	10,599	1,493	378	1,871	2,584	401	2,985	75	2,589	52
1967	9,739	590	10,329	1,440	368	1,808	2,687	383	3,070	72	2,574	49
1968	10,762	589	11,351	1,473	439	1,912	2,931	375	3,306	65	3,003	40

<sup>a</sup>After 1956 shipments of veneer and plywood; after 1960, shipments of shingles and shakes.

<sup>b</sup>Source: Sawmills. D.B.S. Cat. No. 35-204.

<sup>c</sup>Source: Veneer and Plywood Mills. D.B.S. Cat. No. 35-206. After 1955 veneer was reported as greater than 1/20" and less than 1/20". This was converted to 1/10" basis by assuming all hardwood as 1/32" and all softwood as 1/8". Hence after 1955, production figures are approximations.

<sup>d</sup>Source: Hardwood Flooring Industry. D.B.S. Cat. No. 35-203, shipments from all industries.

<sup>e</sup>Production statistics for softwood veneer are not reliable. Because the major use of softwood veneer is in production of plywood, errors in reporting end uses of veneer make the statistics unreliable. Production figures supposedly do not include veneer used in softwood plywood.

TABLE 21. PRODUCTION OF PULP AND PAPER

Year	Newsprint	Printing Paper	Fine Paper	Tissue and Sanitary Paper	Wrapping Paper	Other Paper	Paperboard	Building Board
	M tons							
1950	5,319	123	91	77	223	102	780	97
1951	5,561	147	106	90	257	104	830	131
1952	5,707	130	94	80	223	93	747	122
1953	5,755	141	106	87	238	101	812	145
1954	6,001	154	116	95	250	94	806	134
1955	6,196	177	125	107	264	104	869	158
1956	6,445	203	139	119	288	100	986	187
1957	6,362	199	136	123	277	89	935	180
1958	6,031	205	140	128	293	96	987	202
1959	6,331	229	153	140	330	91	1,041	215
1960	6,689	240	163	149	322	83	1,067	210
1961	6,718	245	175	157	327	81	1,066	294
1962	6,663	245	195	169	333	97	1,178	325
1963	6,657	260	204	201	341	96	1,299	280
1964	7,380	254	241	196	346	101	1,425	291
1965	7,827	278	256	193	366	94	1,553	297
1966	8,530	341	309	208	429	95	1,699	284
1967	8,193	341	305	224	463	91	1,732	295 <sup>a</sup>
1968	8,193	382	292	254	468	109	1,764	337 <sup>a</sup>

Source: Pulp and Paper Mills. D.B.S. Cat. No. 36-204.

<sup>a</sup>All industries.

TABLE 22. EXPORTS OF PRIMARY WOOD PRODUCTS

Year	Fuelwood	Round Mine Timbers <sup>a</sup>	Poles and Pilings	Fence Posts	Railway Ties
	M cords			M pieces	
1950	22	24	254	966	451
1951	15	86	213	1,248	168
1952	18	399	302	1,710	880
1953	16	103	317	1,694	1,648
1954	15	95	264	1,686	883
1955	15	111	223	1,768	579
1956	17	70	246	2,078	529
1957	4	76	246	2,163	681
1958	3	56	249	2,271	865
1959	3	35	196	2,538	931
1960	3	7	305	2,579	803
1961	2	18	440	2,678	512
1962	3	18	586	2,481	195
1963	0	—	366	2,927	135
1964	0	—	296	3,105	276
1965	0	—	252	2,618	331
1966	0	—	312	1,912	81
1967	0	—	332	2,155	93
1968	0	—	476	2,615	84

Source: Exports by Commodities. D.B.S. Cat. No. 65-004.

<sup>a</sup>After 1962, Round Mine Timbers included in Poles and Pilings.

TABLE 23. EXPORTS OF SECONDARY WOOD PRODUCTS

Year	Softwood Lumber	Hardwood Lumber	All Lumber	Softwood Veneer <sup>a</sup>	Hardwood Veneer	All Veneer	Softwood Plywood	Hardwood Plywood	All Plywood	Hardwood Flooring	Shingles and Shakes	Misc. Sawn Material
	million bd ft			million ft <sup>2</sup> (1/10" basis)			million ft <sup>2</sup> (1/4" basis)			million bd ft	M squares	million bd ft
1950	3,381	182	3,563	171	55	226	3	51	54	16	2,924	48
1951	3,284	149	3,433	218	59	277	22	50	72	6	2,588	47
1952	3,220	117	3,337	147	84	231	12	60	72	3	2,113	38
1953	3,250	122	3,372	174	109	283	3	55	58	4	2,071	50
1954	3,949	95	4,044	206	97	303	8	75	83	6	2,306	37
1955	4,481	123	4,604	327	109	436	23	99	122	11	2,511	42
1956	3,836	106	3,942	237	122	359	28	81	109	10	1,991	42
1957	3,547	90	3,637	56	102	158	43	65	108	10	1,746	37
1958	3,843	90	3,933	75	123	198	48	44	92	10	1,846	36
1959	4,047	122	4,169	53	160	213	118	40	158	11	1,801	35
1960	4,447	116	4,563	34	145	179	164	29	193	12	1,950	33
1961	4,824	100	4,924	43	164	207	181	25	206	13	2,058	36
1962	5,315	131	5,446	42	204	246	271	37	308	14	2,256	39
1963	6,095	126	6,221	63	225	288	280	49	329	18	2,565	39
1964	6,324	130	6,454	28	260	288	455	48	503	20	2,559	44
1965	6,318	156	6,474	82	280	362	448	47	495	20	2,527	43
1966	5,915	202	6,117	193	262	455	510	50	560	18	2,341	39
1967	6,321	152	6,473	242	258	500	642	38	680	17	2,330	37
1968	7,040	142	7,182	183	283	466	690	37	727	14	2,666	35

Source: Exports by Commodities. D.B.S. Cat. No. 65-004.

<sup>a</sup>All veneer figures converted to 1/10" basis from original basis.



TABLE 24. EXPORTS OF PULP AND PAPER

Year	Newsprint	Printing Paper	Fine Paper	Tissue and Sanitary Paper	Wrapping Paper	Other Papers <sup>a</sup>	Paper-board	Building Board	Dissolving and Alpha Pulp	All Other Pulp	All Pulp <sup>b</sup>
M tons											
1950	4,938	17	2	3	10	2.4	75	7	290	1,542	1,832
1951	5,112	27	7	4	17	6.7	92	22	363	1,864	2,227
1952	5,327	29	10	4	14	1.7	73	19	339	1,591	1,930
1953	5,375	28	7	2	11	3.8	52	19	383	1,558	1,941
1954	5,522	27	9	3	14	1.5	42	18	369	1,801	2,170
1955	5,763	33	8	5	18	0.7	55	48	330	2,024	2,354
1956	5,967	38	6	4	15	0.4	79	39	303	2,055	2,358
1957	5,901	37	6	4	20	0.5	87	39	275	1,998	2,273
1958	5,683	42	6	3	34	0.7	82	27	218	1,994	2,212
1959	5,910	51	8	3	43	1.0	79	37	273	2,167	2,440
1960	6,190	52	9	5	32	1.9	106	25	242	2,349	2,591
1961	6,254	46	17	7	43	3.8	106	24	307	2,551	2,858
1962	6,148	48	22	13	36	5.9	131	24	355	2,680	3,035
1963	6,212	54	25	12	31	10.5	170	33	372	2,959	3,331
1964	6,816	74	34	15	32	15.9	179	42	402	3,227	3,629
1965	7,190	99	31	12	29	19.1	187	58	385	3,463	3,848
1966	7,821	141	31	14	47	21.6	258	39	364	3,721	4,085
1967	7,464	156	26	19	100	24	247	40	351	3,917	4,268
1968	7,479	134	28	18	111	32	253	62	368	4,602	4,970

Source: Exports by Commodities. D.B.S. Cat. No. 65-004.

<sup>a</sup>Prior to 1961, by special request from D.B.S.

<sup>b</sup>Excludes screenings.

TABLE 25. IMPORTS OF PRIMARY WOOD PRODUCTS

Year	Fuelwood	Poles and Pilings <sup>a</sup>	Fence Posts	Railway Ties	Charcoal	Converted to Roundwood
	M cords		M Pieces		tons	M ft <sup>3</sup>
1950	1	40	2	105	515	109
1951	2	24	14	194	1,152	245
1952	3	54	23	593	1,304	277
1953	1	37	22	329	1,650	351
1954	1	39	48	116	1,872	398
1955	1	73	40	99	1,802	383
1956	1	133	31	126	1,802	383
1957	2	106	61	140	1,957	416
1958	1	55	82	169	1,949	414
1959	1	70	120	432	2,578	548
1960	1	77	140	559	3,748	796
1961	1	51	161	75	5,553	1,177
1962	0	85	165	14	4,691	994
1963	0	88	175	52	4,884	1,035
1964	0	90	183	35	7,494	1,589
1965	0	92	191	41	7,566	1,604
1966	0	93	196	43	9,746	2,066
1967	0	94	201	166	10,025	2,125
1968	0	95	205	106	12,753	2,704

Source: Imports by Commodities. D.B.S. Cat. No. 65-007.

<sup>a</sup>Imports of Poles and Pilings, and Fence Posts, are not reported after 1961. Import figures for these products for 1961-1966 are trend extensions.

TABLE 26. IMPORTS OF SECONDARY WOOD PRODUCTS

Year	Softwood Lumber	Hardwood Lumber	All Lumber	Softwood Veneer <sup>a b</sup>	Hardwood Veneer	All Veneer	Softwood Plywood	Hardwood Plywood	All Plywood	Hardwood Flooring	Shingles and Shakes
	million bd ft			million ft <sup>2</sup> (1/10" basis)			million ft <sup>2</sup> (¼" basis)			million bd ft	M squares
1950	42	39	81	3.3	9.3	12.6	0.7	1.2	1.9	7	1
1951	75	50	125	4.0	9.9	13.9	0.2	5.7	5.9	10	2
1952	89	51	140	0.5	6.9	7.4	13.4	15.5	28.9	13	42
1953	84	60	144	3.9	11.0	14.9	6.4	21.6	28.0	16	45
1954	98	58	156	3.2	9.3	12.5	1.8	18.7	20.5	18	34
1955	127	80	207	4.2	11.9	16.1	3.7	29.4	33.1	21	17
1956	172	97	269	4.4	12.5	16.9	14.5	44.7	59.2	18	34
1957	143	80	223	4.4	14.2	18.6	6.6	46.5	53.1	17	22
1958	156	91	246	5.7	18.5	24.2	3.7	58.7	62.4	24	19
1959	176	113	289	8.2	29.5	37.7	98.9	88.7	187.6	23	25
1960	138	95	234	7.0	24.1	31.1	5.0	66.9	71.9	12	11
1961	144	94	238	9.2	31.8	41.0	3.0	89.5	92.5	11	13
1962	127	94	221	—	41.6	49.1	2.0	110.2	112.2	11	4
1963	129	99	228	—	44.9	52.4	1.0	93.5	94.5	8	2
1964	159	113	272	—	53.6	61.1	4.3	145.3	149.3	9	1
1965	161	119	280	—	48.5	56.0	1.6	177.7	179.3	7	1
1966	151	110	261	—	51.7	59.2	3.5	150.7	154.2	6	0
1967	176	113	289	—	67.1	74.6	6.5	200.1	206.5	8	0
1968	198	108	306	—	53.8	61.3	5.2	203.9	209.2	7	0

Source: Imports by Commodities. D.B.S. Cat. No. 65-007.

<sup>a</sup>Before 1964, imports of hardwood veneer shown only in value. Same is true of plywood prior to 1959. Value converted to volume by taking average value/quantity ratio, where reported, and applying this for missing years. For softwood veneer, where no quantity is ever reported, ratio of hardwood veneer applied. For these reasons, imports of plywood and veneers should be viewed with caution.

<sup>b</sup>After 1961, included with hardwood veneer.

TABLE 27. IMPORTS OF PULP AND PAPER

Year	Printing Paper <sup>a</sup>	Fine Paper	Tissue and Sanitary	Wrapping Paper	Other Paper	Paperboard	Building Board	Wood Pulp
	M tons							
1950	1.9	3.2	5.9	1.2	7.4	17.6	13.4	36.6
1951	0.8	5.9	3.9	2.4	8.9	21.5	9.2	36.4
1952	1.1	6.2	3.3	1.3	10.1	22.5	11.7	54.6
1953	2.2	5.5	4.3	1.3	12.7	25.2	18.5	43.4
1954	4.1	5.9	5.0	3.6	13.7	31.2	23.0	51.7
1955	4.0	7.5	5.8	3.5	16.0	37.4	23.6	59.6
1956	3.5	6.6	6.8	4.1	17.1	37.5	32.7	63.9
1957	3.1	7.8	8.3	6.3	17.1	42.0	28.7	64.9
1958	5.3	8.0	9.1	8.5	21.1	45.7	26.2	53.8
1959	5.3	7.9	9.1	4.7	25.9	35.1	30.3	65.3
1960	5.7	7.4	8.2	4.5	32.1	66.3	31.4	63.9
1961	6.4	6.5	7.1	4.7	44.0	81.6	24.6	61.7
1962	5.9	5.9	7.1	2.5	37.7	78.8	23.0	63.3
1963	6.2	5.5	6.6	3.8	28.2	75.3	22.6	74.2
1964	7.4	10.9	6.7	11.5	18.0	81.4	22.4	75.2
1965	7.7	12.7	8.2	7.4	18.5	86.3	24.4	93.5
1966	8.2	14.0	6.4	5.4	23.7	77.1	23.9	58.0
1967	8.8	13.8	6.2	6.4	24.4	81.9	24.2	36.2
1968	14.3	13.9	10.0	16.9	24.1	85.0	30.3	46.3

Source: Imports by Commodities. D.B.S. Cat. No. 65-007.

<sup>a</sup>No newsprint is imported.

TABLE 28. APPARENT CONSUMPTION OF PRIMARY WOOD PRODUCTS

Year	Fuelwood	Round Mine Timbers	Flatted Mine Timbers	Poles and Pilings	Fence Posts	Fence Rails	Railway Ties	Wood for Charcoal	Misc. Roundwood	General Primary <sup>a</sup>
	M cords		M pieces					M ft <sup>3</sup>		
1950	5,060	147	709	1,162	9,049	1,925	4,769	3,731	3,196	454,436
1951	4,804	228	805	1,257	8,558	1,898	6,581	3,627	3,049	441,399
1952	4,470	131	947	1,660	9,032	1,981	9,718	3,493	4,539	414,486
1953	4,266	153	818	1,282	8,039	1,922	6,767	3,094	3,558	391,736
1954	3,904	152	887	1,109	7,545	1,963	4,223	3,388	2,691	358,971
1955	3,609	88	763	1,195	7,194	1,714	4,382	3,153	3,415	331,040
1956	3,606	138	878	1,504	6,958	1,826	5,621	3,726	1,090	337,762
1957	3,561	97	1,159	1,533	7,263	2,206	7,004	3,740	897	331,679
1958	3,271	66	708	927	7,170	1,851	4,499	3,318	1,248	296,216
1959	3,114	67	261	849	8,025	1,410	3,109	3,468	4,382	286,440
1960	3,002	95	344	1,030	9,940	1,038	2,986	3,945	3,938	284,534
1961	2,993	59	695	1,268	7,937	769	1,771	4,277	15,527	293,576
1962	2,813	49	923	1,225	11,166	894	2,344	4,154	16,876	283,723
1963	2,616	65	570	985	16,046	728	1,388	4,715	14,215	268,443
1964	2,434	64	641	1,131	15,763	789	2,012	4,949	7,982	249,761
1965	2,263	57	749	1,032	16,850	912	2,627	4,964	11,680	239,141
1966	2,144	66	760	1,311	17,797	882	3,237	4,991	18,938	242,962
1967	2,106	57	791	909	19,134	1,547	3,345	4,445	12,245	228,158
1968	2,066	49	863	332	15,182	689	2,999	4,784	8,034	206,150

<sup>a</sup>All primary forest products except the sawn materials (flatted mine timbers and railway ties) were converted to cubic feet and aggregated.

TABLE 29. APPARENT CONSUMPTION OF SECONDARY WOOD PRODUCTS

Year	Softwood Lumber	Hardwood Lumber	All Lumber	Softwood Veneer <sup>a</sup>	Hardwood Veneer	All Veneer	Softwood Plywood	Hardwood Plywood	All Plywood	Hardwood Flooring	Shingles and Shakes	Misc. Sawn Materials
	million bd ft			million ft <sup>2</sup> (1/10" basis)			million ft <sup>2</sup> (3/4" basis)			million bd ft	M squares	million bd ft
1950	2,768	304	3,072	135			387	46	433	68	268	66
1951	3,221	419	3,640	171			461	57	518	79	396	64
1952	3,167	444	3,611	150			465	86	545	63	354	55
1953	3,615	462	4,077	214			632	117	749	78	584	37
1954	2,966	390	3,356	193			719	108	827	80	439	38
1955	3,193	331	3,524	228			937	134	1,071	86	402	37
1956	3,615	451	4,066	97			1,071	185	1,256	76	842	35
1957	3,249	436	3,685	95			996	207	1,203	75	534	39
1958	3,113	380	3,493	99			1,234	269	1,503	88	497	33
1959	3,325	386	3,711	123			1,213	349	1,562	84	434	30
1960	3,261	422	3,683	99			1,223	295	1,518	61	405	33
1961	3,127	424	3,551	92			1,450	339	1,789	61	245	21
1962	3,222	382	3,604	130			1,471	395	1,866	63	257	17
1963	3,444	441	3,885	136			1,804	409	2,213	56	317	13
1964	3,663	510	4,174	112			1,762	469	2,231	67	108	9
1965	4,133	488	4,621	123			1,888	516	2,404	68	86	8
1966	4,262	481	4,743	168			2,078	502	2,580	63	248	13
1967	3,594	351	4,145	177			2,052	545	2,597	63	244	12
1968	3,920	555	4,475	210			2,246	542	2,788	58	337	5

<sup>a</sup>Due to the confused state of production statistics for softwood veneer, apparent consumption is not calculated.

TABLE 30. APPARENT CONSUMPTION OF PULP AND PAPER

Year	Newsprint	Printing paper	Fine paper	Tissue and Sanitary	Wrapping paper	Other paper	Paperboard	Building board
M tons								
1950	381	108	92	80	214	107	723	103
1951	449	121	105	90	242	106	760	118
1952	380	102	90	79	210	101	697	115
1953	380	115	105	89	228	110	785	145
1954	479	128	113	97	240	106	795	139
1955	433	148	125	108	250	119	851	134
1956	478	169	140	122	277	117	945	181
1957	461	165	138	127	263	105	890	170
1958	348	168	142	134	268	116	951	201
1959	441	183	153	146	292	116	997	208
1960	499	194	161	152	295	113	1,027	216
1961	464	205	164	157	289	121	1,042	295
1962	515	203	179	163	300	129	1,126	324
1963	445	212	185	196	314	113	1,204	270
1964	564	187	218	188	326	103	1,327	277
1965	637	187	238	189	344	94	1,452	263
1966	709	208	292	200	387	97	1,518	269
1967	729	194	293	211	387	91	1,567	279
1968	714	262	278	246	374	101	1,596	305

TABLE 31. PER CAPITA CONSUMPTION OF PRIMARY WOOD PRODUCTS

Year	Population	Fuelwood	Round Mine Timbers	Flatted Mine Timbers	Poles and Pilings	Fence Posts	Fence Rails	Railway Ties	Wood for Charcoal	Misc. Roundwood
	M	cords				pieces				ft <sup>3</sup>
1950	13,712	.37	.011	.05	.09	.66	.14	.35	.27	.23
1951	14,009	.34	.016	.06	.09	.61	.14	.47	.26	.22
1952	14,459	.31	.091	.07	.11	.62	.14	.67	.24	.31
1953	14,845	.29	.010	.06	.09	.54	.13	.46	.21	.24
1954	15,287	.26	.010	.06	.07	.50	.13	.28	.22	.18
1955	15,698	.23	.006	.05	.08	.46	.11	.28	.20	.22
1956	16,081	.22	.009	.05	.09	.43	.11	.35	.23	.07
1957	16,610	.21	.006	.07	.09	.44	.13	.42	.23	.05
1958	17,080	.19	.004	.04	.05	.42	.11	.26	.19	.07
1959	17,483	.18	.004	.01	.05	.46	.08	.18	.20	.25
1960	17,870	.17	.005	.02	.06	.56	.06	.17	.22	.22
1961	18,238	.16	.003	.04	.07	.44	.04	.10	.24	.85
1962	18,583	.15	.003	.05	.06	.60	.05	.13	.22	.91
1963	18,931	.14	.003	.03	.05	.85	.04	.07	.25	.75
1964	19,290	.12	.003	.03	.06	.82	.04	.10	.26	.41
1965	19,644	.11	.002	.04	.05	.66	.05	.13	.25	.59
1966	20,229	.11	.003	.04	.06	.89	.04	.16	.25	.95
1967	20,405	.10	.003	.04	.04	.94	.08	.16	.22	.60
1968	20,744	.10	.002	.04	.02	.73	.03	.14	.23	.39

TABLE 32. PER CAPITA CONSUMPTION OF SECONDARY WOOD PRODUCTS

Year	Population	Softwood Lumber	Hardwood Lumber	All Lumber	Softwood Veneer <sup>a</sup>	Hardwood Veneer	All Veneer	Softwood Plywood	Hardwood Plywood	All Plywood	Hardwood Flooring	Shingles and Shakes	Misc. Sawn Materials
	M	bd ft			ft <sup>2</sup> (1/10" basis)			ft <sup>2</sup> (1/4" basis)			bd ft	squares	bd ft
1950	13,712	201.8	22.2	224.0	9.8			28.2	3.3	31.5	4.9	.020	4.8
1951	14,009	229.9	29.9	259.8	12.2			32.9	4.0	36.9	5.6	.028	4.6
1952	14,459	219.0	30.7	249.7	10.4			32.1	5.9	38.0	4.3	.024	3.8
1953	14,845	243.5	31.1	274.6	14.4			42.5	7.8	50.3	5.2	.039	2.5
1954	15,287	194.0	25.5	219.5	12.6			47.0	7.0	54.0	5.2	.029	2.5
1955	15,698	203.4	21.1	224.5	14.5			59.6	8.5	68.1	5.4	.026	2.4
1956	16,081	224.7	28.0	252.7	6.0			66.6	11.5	78.1	4.7	.052	2.2
1957	16,610	195.6	26.2	221.8	5.7			60.0	12.5	72.5	4.5	.032	2.3
1958	17,080	182.3	22.2	204.5	5.8			72.2	15.7	87.9	5.2	.029	1.9
1959	17,483	190.2	22.1	212.3	7.0			69.4	20.0	89.4	4.8	.025	1.7
1960	17,870	182.5	23.6	206.1	5.6			68.4	16.5	84.9	3.4	.023	1.8
1961	18,238	171.5	23.2	194.7	5.0			79.5	18.5	98.0	3.3	.013	1.2
1962	18,583	173.4	20.6	194.0	7.0			79.1	21.3	100.4	3.4	.014	0.9
1963	18,931	181.9	23.3	205.2	7.2			95.3	21.6	116.9	3.0	.017	0.7
1964	19,290	189.9	26.4	216.3	5.8			91.3	24.3	115.6	3.5	.006	0.5
1965	19,644	210.4	24.8	235.2	6.3			96.1	26.3	122.4	3.5	.004	0.4
1966	20,229	212.9	24.0	236.9	8.4			103.8	25.1	128.9	3.2	.012	0.6
1967	20,405	176.1	27.0	203.1	8.7			100.6	26.7	127.3	3.1	.012	0.6
1968	20,744	189.0	26.8	215.8	10.1			108.3	26.1	134.4	2.8	.016	0.2

<sup>a</sup>Because of the unreliability of production statistics for softwood veneer, per capita consumption is not calculated.

TABLE 33. PER CAPITA CONSUMPTION OF PULP AND PAPER

Year	Population	Newsprint	Printing Paper	Fine Paper	Tissue and Sanitary Paper	Wrapping Paper	Other Paper	Paperboard	Building Board
	M					pounds			
1950	13,712	55.4	15.8	13.4	11.7	31.2	15.6	105.5	15.0
1951	14,009	64.0	17.2	15.0	12.8	34.6	15.1	108.5	16.8
1952	14,459	52.6	14.2	12.4	11.0	29.0	14.0	96.4	16.0
1953	14,845	51.2	15.4	14.1	12.0	30.7	14.8	105.8	20.0
1954	15,287	62.6	16.8	14.8	12.7	31.4	13.9	104.0	18.2
1955	15,698	55.2	18.8	15.9	13.8	31.8	15.2	108.4	17.0
1956	16,081	59.4	21.0	17.4	15.2	34.4	14.6	117.5	27.8
1957	16,610	55.5	19.9	16.6	15.3	31.7	12.6	107.2	24.8
1958	17,080	40.7	19.7	16.6	15.7	31.4	13.6	111.4	27.5
1959	17,483	50.4	20.9	17.5	16.7	33.4	13.3	114.1	27.7
1960	17,870	55.8	21.7	18.0	17.0	33.0	12.6	114.9	26.3
1961	18,238	50.8	22.5	18.0	17.2	31.8	13.3	114.3	32.4
1962	18,583	55.4	21.8	19.3	17.5	32.3	13.9	121.2	34.9
1963	18,931	47.0	22.4	19.5	20.7	33.2	11.9	127.2	34.3
1964	19,290	58.5	19.4	22.6	19.5	33.8	10.7	137.6	28.5
1965	19,644	64.9	19.0	24.4	19.2	35.0	9.6	147.8	26.2
1966	20,229	70.8	20.8	29.2	20.0	38.7	9.7	151.7	26.8
1967	20,405	71.5	19.0	28.7	20.7	37.9	8.9	153.6	27.3
1968	20,744	68.8	25.3	26.8	23.7	36.1	9.7	153.9	29.4

TABLE 34. EXPORTS OF PRIMARY WOOD PRODUCTS TO THE UNITED STATES

Year	Fuelwood	Round Mine Timbers	Poles & Pilings	Fence Posts	Railway Ties
	M cords			M pieces	
1950	22	—	249	965	38
1951	15	—	208	1,247	25
1952	18	—	298	1,709	9
1953	16	—	265	1,694	123
1954	15	—	227	1,685	22
1955	15	—	216	1,768	16
1956	17	—	239	2,078	129
1957	4	—	224	2,163	139
1958	3	—	173	2,271	73
1959	3	1	179	2,537	114
1960	3	—	215	2,579	136
1961	2	—	291	2,677	65
1962	3	—	318	2,481	129
1963	—	—	272	2,926	135
1964	—	—	230	3,104	123
1965	—	—	226	2,618	86
1966	—	—	236	1,911	78
1967	—	—	201	2,155	83
1968	—	—	255	2,612	45

Source: Exports by Commodities, D.B.S. Cat. No. 65-004.

TABLE 35. EXPORTS OF SECONDARY WOOD PRODUCTS TO THE UNITED STATES

Year	Softwood Lumber	Hardwood Lumber	All Lumber	Softwood Veneer	Hardwood Veneer <sup>a</sup>	All Veneer	Softwood Plywood	Hardwood Plywood	All Plywood	Hardwood Flooring	Shingles and Shakes	Misc. Sawn Material <sup>b</sup>
	million bd ft			million ft <sup>2</sup> (1/10" basis)			million ft <sup>2</sup> (1/4" basis)			million bd ft	M squares	million bd ft
1950	2,840.86	167.53	3,008.39	171.49	54.91	226.40	1.00	50.76	51.76	15.54	2,842.47	28.05
1951	2,021.86	140.42	2,162.28	217.56	57.61	275.17	.44	49.88	50.32	5.71	2,477.40	28.85
1952	2,143.85	105.17	2,249.02	146.60	81.38	227.98	.35	60.25	60.60	2.81	2,056.91	25.54
1953	2,331.63	116.52	2,448.15	174.26	107.19	281.45	.05	54.65	54.70	4.20	2,006.96	35.40
1954	2,705.51	85.72	2,791.23	206.02	97.05	303.07	1.06	75.15	76.21	4.96	2,242.39	29.49
1955	3,164.17	109.88	3,274.05	326.88	108.20	435.08	.57	98.73	99.30	7.45	2,418.85	31.56
1956	2,968.03	93.76	3,061.79	236.71	122.30	359.01	.74	80.69	81.43	4.71	1,926.48	31.01
1957	2,618.30	80.77	2,699.07	50.20	101.66	157.86	.36	64.56	64.92	4.57	1,676.88	29.10
1958	3,038.24	81.40	3,119.64	75.10	123.23	198.33	1.13	43.38	44.51	5.22	1,803.60	26.58
1959	3,405.41	112.64	3,518.05	53.18	160.04	213.22	.81	37.52	38.33	5.49	1,745.48	27.89
1960	3,373.75	106.37	3,480.12	34.55	144.00	178.55	.91	27.91	28.82	5.38	1,887.39	27.74
1961	3,680.29	88.71	3,769.00	42.90	163.04	205.94	2.46	24.47	26.93	5.46	2,013.64	31.37
1962	4,180.35	118.62	4,298.97	42.07	198.97	241.04	.97	35.83	36.80	5.66	2,222.20	35.95
1963	4,628.18	116.33	4,744.51	62.82	216.13	278.95	5.02	46.72	51.74	8.78	2,515.38	35.51
1964	4,627.51	116.97	4,744.48	28.47	244.27	272.74	.14	45.25	45.39	9.52	2,503.29	41.53
1965	4,575.08	143.44	4,718.52	82.04	262.79	344.83	.85	45.09	45.94	9.75	2,489.24	41.79
1966	4,389.01	190.90	4,579.91	192.64	248.21	440.85	3.25	46.23	49.48	11.09	2,299.85	38.57
1967	4,526.59	142.97	4,669.56	193.58	244.16	437.74	.32	33.96	34.28	8.30	2,291.90	36.53
1968	5,423.46	131.60	5,555.06	146.07	261.72	407.79	12.46	33.47	45.93	7.05	2,619.32	39.94

Source: Exports by Commodities, D.B.S. Cat. No. 65-004.

<sup>a</sup>Conversion Factor: 0.3125, assuming Hardwood Veneer is 1/32" thickness.

<sup>b</sup>Conversion Factor: Laths—1000=166 FBM; Spoolwood, Pickets—1000=300 FBM.



TABLE 36. EXPORTS OF PULP AND PAPER TO THE UNITED STATES

Year	News-print	Printing Paper	Fine Paper	Tissue and Sanitary	Wrapping Paper	Other Paper	Paper-board	Building Board	Dissolving & Alpha Pulp	All Other Pulp	All Pulp <sup>a</sup>
M tons											
1950	4,725	14.923	.078	.366	2.172	1.745	64.028	5.471	240.897	1,439.353	1,680.250
1951	4,775	21.537	.106	.052	4.276	1.678	66.493	14.707	255.113	1,560.480	1,815.593
1952	4,851	22.649	.058	—	2.303	.910	52.840	14.915	218.424	1,359.802	1,578.226
1953	4,917	23.502	.044	—	4.713	2.907	49.422	15.822	238.805	1,352.082	1,590.887
1954	4,867	22.694	.026	—	6.062	.834	31.894	12.927	218.478	1,440.652	1,659.130
1955	5,028	27.453	.087	.002	9.054	.267	31.829	38.140	195.731	1,661.192	1,856.923
1956	5,219	30.437	.048	.097	6.994	.044	23.229	32.837	175.481	1,727.949	1,903.430
1957	5,058	29.996	.028	.008	4.197	.018	22.321	33.086	158.750	1,678.889	1,837.639
1958	4,892	35.773	.067	.004	4.222	.132	23.378	20.232	163.010	1,662.058	1,825.068
1959	5,108	43.940	.026	.006	8.669	.033	14.577	30.081	176.779	1,780.124	1,956.903
1960	5,230	44.127	.033	.005	3.494	.389	5.079	19.752	174.766	1,814.324	1,989.093
1961	5,228	38.043	.200	.859	4.370	.715	5.919	19.393	241.520	1,924.138	2,165.659
1962	5,226	38.815	.889	.210	4.033	1.672	15.842	20.774	287.177	2,102.348	2,389.525
1963	5,251	41.673	.998	1.724	9.059	3.055	16.539	29.496	285.920	2,211.115	2,497.041
1964	5,676	55.769	.928	.488	9.316	3.428	18.852	34.739	294.783	2,375.242	2,670.025
1965	6,112	81.423	2.076	.852	8.980	7.171	10.370	52.431	294.535	2,517.010	2,811.545
1966	6,652	115.161	2.735	2.288	16.746	8.866	8.585	32.987	283.214	2,683.145	2,966.359
1967	6,340	130.107	.997	6.634	12.182	7.124	6.575	32.016	264.555	2,636.679	2,901.234
1968	6,139	117.193	1.508	5.363	9.901	6.312	14.578	52.441	283.718	2,941.164	3,224.882

Source: Exports by Commodities. D.B.S. Cat. No. 65-004.

<sup>a</sup>Excludes wood pulp screenings. After 1966, mechanical screenings included with similar pulp.

TABLE 37. EXPORTS OF PRIMARY WOOD PRODUCTS TO THE UNITED KINGDOM

Year	Fuelwood	Round Mine Timbers	Poles & Pilings	Fence Posts	Railway Ties
M cords		M pieces			
1950	—	17	—	—	28
1951	—	86	—	—	61
1952	—	352	—	—	757
1953	—	101	—	—	1,217
1954	—	90	—	—	549
1955	—	96	—	—	523
1956	—	62	—	—	400
1957	—	69	4	—	539
1958	—	42	—	—	788
1959	—	30	—	—	174
1960	—	7	—	—	317
1961	—	—	—	—	444
1962	—	—	—	—	66
1963	—	—	—	—	—
1964	—	—	—	—	142
1965	—	—	—	—	241
1966	—	—	—	—	—
1967	—	—	—	—	10
1968	—	—	—	—	39

Source: Exports by Commodities. D.B.S. Cat. No. 65-004.

TABLE 38. EXPORTS OF SECONDARY WOOD PRODUCTS TO THE UNITED KINGDOM

Year	Softwood Lumber	Hardwood Lumber	All Lumber	Softwood Veneer	Hardwood Veneer <sup>a</sup>	All Veneer	Softwood Plywood	Hardwood Plywood	All Plywood	Hardwood Flooring	Shingles and Shakes	Misc. Sawn Material <sup>b</sup>
	million bd ft			million ft <sup>2</sup> (1/10" basis)			million ft <sup>2</sup> (1/4" basis)			million bd ft	M squares	million bd ft
1950	262.92	12.76	275.68	—	.32	.32	.09	—	.09	.44	28.70	12.88
1951	889.06	6.98	896.04	.52	1.44	1.96	17.44	.04	17.48	.20	38.05	7.32
1952	846.21	10.97	857.18	—	2.41	2.41	9.47	—	9.47	.10	19.00	14.13
1953	596.86	3.59	600.45	—	1.29	1.29	.44	.04	.48	.17	22.63	4.17
1954	861.36	7.83	869.19	—	.20	.20	5.12	.05	5.17	.75	29.18	4.25
1955	829.24	10.96	840.20	—	.05	.05	18.19	.30	18.49	3.43	27.41	3.84
1956	469.42	11.38	480.80	—	—	—	24.41	.47	24.88	5.17	27.59	6.75
1957	496.50	8.00	504.50	—	.13	.13	38.58	.26	38.84	4.91	28.05	6.56
1958	425.64	7.43	433.07	—	.08	.08	44.00	.71	44.71	4.34	18.54	6.60
1959	334.50	8.46	342.96	.12	.01	.13	113.24	2.66	115.90	5.59	30.33	2.97
1960	656.19	8.93	665.12	.02	.47	.49	154.76	.53	155.29	6.25	38.12	2.51
1961	623.71	9.92	633.63	—	.33	.33	172.78	.71	173.49	7.46	25.35	5.52
1962	620.89	10.59	631.48	—	.08	.08	255.45	1.05	256.50	7.84	17.48	3.15
1963	692.39	7.81	700.20	—	—	—	252.61	2.06	254.67	8.37	26.02	3.60
1964	1,000.39	9.87	1,010.26	—	.19	.19	406.77	2.81	409.58	10.04	27.81	2.60
1965	957.54	10.20	967.74	—	.31	.31	370.79	1.92	372.71	9.71	16.81	1.68
1966	779.70	8.25	787.95	—	.33	.33	378.09	2.84	380.93	7.01	15.74	0.72
1967	818.85	6.04	824.89	—	.70	.70	483.07	2.70	485.77	7.92	12.20	0.80
1968	579.50	7.00	586.50	—	2.28	2.28	489.30	2.58	491.88	6.34	10.65	1.07

Source: Exports by Commodities. D.B.S. Cat. No. 65-004.

<sup>a</sup>Conversion Factor: .3125, assuming Veneer Hardwood is 1/32" thickness.<sup>b</sup>Conversion Factor: Laths—1000=166 FBM; Spoolwood, Pickets—1000=300 FBM.

TABLE 39. EXPORTS OF PULP AND PAPER TO THE UNITED KINGDOM

Year	Newsprint	Printing Paper	Fine Paper	Tissue and Sanitary	Wrapping Paper	Other Paper	Paper-board	Building Board	Dissolving & Alpha Pulp	All Other Pulp	All Pulp <sup>a</sup>
	M tons										
1950	19	—	.084	—	1.240	—	1.434	—	35.761	82.160	117.921
1951	72	.008	.045	—	3.841	—	9.601	4.651	55.644	161.606	217.250
1952	131	.026	.164	—	2.268	—	12.319	2.136	49.642	161.043	210.685
1953	158	—	.093	—	1.067	—	2.223	.390	76.815	138.136	214.951
1954	250	—	.120	—	1.975	—	8.195	1.433	72.422	198.524	270.946
1955	286	.131	.372	.001	3.484	—	23.183	5.563	56.814	223.761	280.575
1956	348	.956	.489	.998	3.726	—	54.308	2.508	35.700	208.463	244.163
1957	372	.971	.501	1.995	7.667	—	63.967	3.402	41.485	183.998	225.483
1958	389	1.084	.789	.364	18.447	—	55.704	3.705	17.606	198.541	216.147
1959	394	1.480	1.390	.555	25.716	—	61.250	5.894	21.446	195.890	217.336
1960	461	2.040	2.522	1.038	22.434	.048	96.905	6.275	19.678	263.070	282.748
1961	457	1.583	4.796	3.382	23.795	.142	91.131	3.466	16.144	248.293	264.437
1962	482	2.819	7.151	9.242	26.031	.540	108.340	1.106	21.957	221.718	243.675
1963	459	4.786	11.123	4.785	18.361	2.448	141.635	1.203	22.047	257.788	279.835
1964	480	12.358	15.499	8.434	19.843	1.856	131.302	1.187	23.100	315.562	338.662
1965	370	13.141	9.594	4.574	16.090	3.215	141.535	1.218	27.022	320.139	347.161
1966	384	17.407	9.224	5.942	26.131	1.993	178.066	2.249	13.831	309.935	323.766
1967	336	10.489	6.888	5.513	81.241	2.360	183.273	4.987	20.518	252.025	272.543
1968	438	8.035	6.144	1.103	89.056	1.367	173.929	6.761	21.879	294.528	316.407

Source: Exports by Commodities. D.B.S. Cat. No. 65-004.

<sup>a</sup>Excludes screenings. After 1966, mechanical screenings included with similar pulp.

TABLE 40. EXPORTS OF PRIMARY WOOD PRODUCTS TO JAPAN

Year	Fuelwood	Round Mine Timbers	Poles & Pilings	Fence Posts	Railway Ties
	M cords			M pieces	
1950	—	—	—	—	—
1951	—	—	—	—	—
1952	—	—	1	—	—
1953	—	—	49	—	—
1954	—	—	34	—	—
1955	—	—	2	—	—
1956	—	—	6	—	—
1957	—	—	15	—	—
1958	—	—	75	—	—
1959	—	—	15	—	—
1960	—	—	90	—	—
1961	—	—	149	—	3
1962	—	—	267	—	—
1963	—	—	94	—	—
1964	—	—	59	—	1
1965	—	—	24	—	4
1966	—	—	76	—	3
1967	—	—	128	—	—
1968	—	—	216	—	—

Source: Exports by Commodities. D.B.S. Cat. No. 65-004.

TABLE 41. EXPORTS OF SECONDARY WOOD PRODUCTS TO JAPAN

Year	Softwood Lumber	Hardwood Lumber	All Lumber	Softwood Veneer	Hardwood Veneer <sup>a</sup>	All Veneer	Softwood Plywood	Hardwood Plywood	All Plywood	Hardwood Flooring	Shingles and Shakes	Misc. Sawn Material
	million bd ft			million ft <sup>2</sup> (1/10" basis)			million ft <sup>2</sup> (¼" basis)			million bd ft	M squares	million bd ft
1950	.09	—	.09	—	—	—	—	—	—	—	—	—
1951	1.67	—	1.67	—	—	—	.33	—	.33	—	—	—
1952	—	—	—	—	—	—	—	—	—	—	—	—
1953	2.50	—	2.50	—	—	—	—	—	—	—	—	—
1954	3.47	—	3.47	—	—	—	—	—	—	—	—	—
1955	1.91	—	1.91	—	—	—	—	—	—	—	—	—
1956	4.51	—	4.51	—	—	—	—	—	—	—	—	—
1957	3.85	—	3.85	—	—	—	—	—	—	—	—	—
1958	.99	.22	1.21	—	—	—	—	—	—	—	—	—
1959	.73	—	.73	—	—	—	—	—	—	—	—	—
1960	2.24	—	2.24	—	—	—	—	—	—	—	—	—
1961	166.90	—	166.90	—	—	—	—	—	—	—	—	—
1962	116.50	—	116.50	—	—	—	—	—	—	—	—	—
1963	290.95	.07	291.02	—	—	—	—	—	—	—	—	—
1964	232.99	.56	233.55	—	.06	.06	.07	—	.07	—	—	—
1965	195.45	.32	195.77	—	.03	.03	.30	.03	.33	—	—	—
1966	271.83	.35	272.18	—	—	—	1.27	—	1.27	—	—	—
1967	486.14	.70	486.84	—	.01	.01	7.94	—	7.94	—	—	—
1968	541.41	.74	542.15	—	—	—	28.87	—	28.87	—	—	—

Source: Exports by Commodities. D.B.S. Cat. No. 65-004.

<sup>a</sup>Conversion Factor 0.3125, assuming Hardwood Veneer is 1/32" thickness.

TABLE 42. EXPORTS OF PULP AND PAPER TO JAPAN

Year	Newsprint	Printing Paper	Fine Paper	Tissue and Sanitary	Wrapping Paper	Other Paper	Paper-board	Building Board	Dissolving & Alpha Pulp	All Other Pulp	All Pulp <sup>a</sup>
M tons											
1950	.106	—	—	—	—	—	—	.021	2.307	2.530	4.837
1951	1.344	—	—	—	—	—	—	.106	25.799	35.716	61.515
1952	1.575	—	—	—	—	—	—	—	26.963	3.195	30.158
1953	16.830	.001	—	—	—	—	—	—	44.678	15.595	60.273
1954	1.887	—	—	.002	—	—	—	—	40.588	3.657	44.245
1955	1.343	.005	—	.018	.002	—	—	—	32.359	4.557	36.916
1956	—	.010	—	.004	.012	—	—	—	67.643	16.800	84.443
1957	—	—	—	.001	.013	—	—	.009	46.784	33.655	80.439
1958	—	—	—	.001	—	—	—	—	18.682	3.783	22.465
1959	—	—	—	.001	—	—	—	—	45.553	1.748	47.301
1960	—	.118	—	—	—	—	—	—	13.681	6.319	20.000
1961	—	—	—	—	—	—	—	—	5.934	14.683	20.617
1962	.021	—	—	—	—	—	—	—	12.257	40.264	52.521
1963	.059	—	—	—	.046	—	.864	—	27.395	139.127	166.522
1964	73.454	—	—	—	.084	—	.008	—	38.013	141.712	179.725
1965	13.396	—	—	—	—	—	—	—	37.442	166.637	204.079
1966	19.213	.056	—	—	—	.173	—	—	32.345	228.328	260.673
1967	41.215	.195	—	.107	.115	.261	.030	.003	36.498	280.978	317.476
1968	110.548	.004	—	.021	3.518	.986	.036	.016	30.631	379.691	410.322

Source: Exports by Commodities. D.B.S. Cat. No. 65-004.

<sup>a</sup>Excludes screenings. After 1966, mechanical screenings included with similar pulp.

TABLE 43. EXPORTS OF PRIMARY WOOD PRODUCTS TO OTHER THAN THE UNITED KINGDOM, THE UNITED STATES, AND JAPAN

Year	Fuelwood	Round Mine Timbers	Poles & Pilings	Fence Posts	Railway Ties
M cords		M pieces			
1950	—	7	—	—	385
1951	—	—	3	1	82
1952	—	47	1	1	134
1953	—	2	1	—	308
1954	—	5	1	1	312
1955	—	15	3	—	40
1956	—	8	—	—	—
1957	—	7	2	—	3
1958	—	14	—	—	4
1959	—	3	1	1	643
1960	—	—	—	1	350
1961	—	—	—	1	—
1962	—	—	1	—	—
1963	—	—	—	1	—
1964	—	—	7	1	11
1965	—	—	1	—	—
1966	—	—	—	1	—
1967	—	—	4	—	—
1968	—	—	6	3	—

Source: Exports by Commodities. D.B.S. Cat. No. 65-004.

TABLE 44. EXPORTS OF SECONDARY WOOD PRODUCTS TO OTHER THAN THE UNITED KINGDOM, THE UNITED STATES, AND JAPAN

Year	Softwood Lumber	Hardwood Lumber	All Lumber	Softwood Veneer	Hardwood Veneer <sup>a</sup>	All Veneer	Softwood Plywood	Hardwood Plywood	All Plywood	Hardwood Flooring	Shingles & Shakes	Misc. Swan Material <sup>b</sup>
	million bd ft			million ft <sup>2</sup> (1/10" basis)			million ft <sup>2</sup> (¼" basis)			million bd ft	M squares	million bd ft
1950	276.79	1.58	278.37	—	.14	.14	2.26	.25	2.51	.16	52.72	1.05
1951	371.60	1.66	373.26	—	.32	.32	3.55	.22	3.77	.23	72.91	2.95
1952	229.60	.81	230.41	—	.28	.28	1.86	.22	2.08	.14	36.92	.83
1953	319.38	1.77	321.15	—	.07	.07	2.24	.06	2.30	.06	41.75	.70
1954	378.47	1.31	379.78	—	.24	.24	1.54	.05	1.59	.07	33.97	.97
1955	485.01	1.59	486.60	—	.29	.29	4.29	.09	4.38	.20	64.87	.34
1956	393.40	.81	394.21	—	.18	.18	3.13	.08	3.21	.04	37.41	.20
1957	428.01	1.47	429.48	—	.08	.08	4.49	.32	4.81	.14	41.29	.06
1958	377.83	.52	378.35	—	.10	.10	2.48	.06	2.54	.16	24.23	.12
1959	306.27	.69	306.96	.01	.19	.20	3.64	.04	3.68	.12	25.47	.59
1960	414.33	.75	415.08	—	.20	.20	8.28	.14	8.42	.14	24.91	.78
1961	352.61	1.46	354.07	—	1.12	1.12	6.18	.06	6.24	.11	19.40	.02
1962	397.60	1.91	399.51	—	4.87	4.87	14.86	.06	14.92	.25	15.97	.05
1963	483.06	2.17	485.23	—	8.68	8.68	22.81	.14	22.95	.56	23.16	.01
1964	463.26	2.62	465.88	—	15.14	15.14	48.44	.27	48.71	.50	27.41	.12
1965	589.57	1.63	591.20	—	17.32	17.32	76.02	.33	76.35	.46	21.07	.21
1966	474.38	2.87	477.25	—	13.02	13.02	127.27	.43	127.70	.38	25.62	.21
1967	489.06	2.32	491.38	—	13.40	13.40	129.86	.86	130.72	.46	26.29	.10
1968	496.11	2.49	498.60	.03	18.86	18.89	180.57	.56	181.13	.27	36.21	.24

Source: Exports by Commodities. D.B.S. Cat. No. 65-004.

<sup>a</sup>Conversion Factor 0.3125, assuming Hardwood Veneer is 1/32" thickness.

<sup>b</sup>Conversion Factor, Laths—1000=166 FBM; Spoolwood, Pickets—1000=300 FBM.

TABLE 45. EXPORTS OF PULP AND PAPER TO OTHER THAN THE UNITED KINGDOM, THE UNITED STATES, AND JAPAN

Year	Newsprint	Printing Paper	Fine Paper	Tissue and Sanitary Paper	Wrapping Paper	Other Paper	Paper-board	Building board	Dissolving and Alpha Pulp	All Other Pulp	All Pulp <sup>a</sup>
	M tons										
1950	193.931	2.339	1.987	2.244	6.318	.675	9.544	1.529	11.392	17.550	28.942
1951	263.565	5.894	7.196	3.853	8.683	4.984	16.234	2.275	26.588	106.543	133.131
1952	343.889	6.098	9.908	3.623	9.364	.845	7.379	2.277	44.378	66.380	110.758
1953	283.098	4.898	6.940	2.038	5.385	.886	.271	2.541	22.663	52.773	75.436
1954	402.809	4.044	8.759	3.042	5.668	.678	1.480	3.225	37.039	158.263	195.302
1955	447.714	5.605	7.982	5.119	5.737	.432	1.737	3.757	45.229	133.791	179.020
1956	400.378	6.836	5.854	3.098	4.579	.348	1.506	3.221	24.598	101.056	125.654
1957	471.526	6.378	5.504	2.373	8.388	.441	1.100	2.757	28.366	101.005	129.371
1958	402.130	5.077	5.140	2.130	9.740	.535	2.645	2.586	19.109	128.925	148.034
1959	407.895	5.858	6.202	2.931	8.299	.952	3.075	1.006	28.772	188.537	217.309
1960	499.839	6.085	6.272	3.906	5.678	1.437	4.105	.909	33.877	265.924	299.801
1961	568.599	6.702	12.351	2.613	14.493	2.864	9.163	1.017	43.634	364.164	407.798
1962	439.445	6.197	14.098	3.688	5.589	3.703	6.887	1.751	33.930	315.463	349.393
1963	501.948	7.424	12.671	5.155	3.413	4.977	11.166	2.468	36.702	350.766	387.468
1964	586.216	5.447	17.503	5.956	3.133	10.525	29.158	6.143	45.801	395.152	440.953
1965	693.579	4.505	18.897	6.767	3.611	8.751	35.273	4.282	25.804	458.965	484.769
1966	765.631	8.371	18.468	5.837	3.633	10.647	70.895	3.834	35.061	498.930	533.991
1967	746.223	14.944	18.620	6.223	6.569	13.973	57.028	2.689	29.629	747.101	776.730
1968	791.332	8.960	20.297	11.584	8.574	23.669	64.427	2.758	31.568	987.001	1,018.569

Source: Exports by Commodities. D.B.S. Cat. No. 65-004.

<sup>a</sup>Excludes Screenings. After 1966 mechanical screenings included in similar pulp.

TABLE 46. EXPORTS OF RAW WOOD MATERIALS, BY COUNTRY, 1950-1968

Year	United States			United Kingdom			Japan			Other			Total		
	Logs & Bolts <sup>a</sup>	Pulp-wood	Pulp-chips	Logs & Bolts <sup>a</sup>	Pulp-wood	Pulp-chips	Logs & Bolts <sup>a</sup>	Pulp-wood	Pulp-chips	Logs & Bolts <sup>a</sup>	Pulp-wood	Pulp-chips	Logs & Bolts <sup>a</sup>	Pulp-wood	Pulp-chips
	MM ft b m	M rough cords	M tons	MM ft b m	M rough cords	M tons	MM ft b m	M rough cords	M tons	MM ft b m	M rough cords	M tons	MM ft b m	M rough cords	M tons
1950	49.1	1,699	214	5.2	34.6	—	—	—	—	2.7	1.7	—	57.0	1,735	213.5
1951	35.0	2,572	334	4.9	110.4	—	—	—	—	3.2	188.9	—	43.1	2,871	333.5
1952	32.4	2,198	399	12.5	152.7	—	5.4	—	—	1.9	142.1	—	52.2	2,493	399.2
1953	33.0	1,578	471	5.6	122.6	—	7.1	—	—	1.9	48.6	—	47.6	1,749	471.0
1954	34.9	1,551	597	5.6	133.4	—	5.7	—	—	2.1	94.7	—	48.3	1,779	596.8
1955	26.0	1,551	825	5.3	130.3	—	3.6	—	—	2.2	166.2	—	37.1	1,848	824.7
1956	17.8	1,651	839	6.2	114.6	—	2.3	—	—	1.5	167.2	—	27.8	1,933	838.7
1957	18.3	1,494	885	7.9	110.3	—	3.7	—	—	2.1	179.9	—	32.0	1,784	884.9
1958	10.4	1,105	674	6.6	87.5	—	2.7	0.3	—	2.4	83.4	—	22.1	1,276	674.3
1959	11.8	966	591	5.1	64.8	—	1.4	—	—	3.0	69.7	—	21.3	1,100	591.3
1960	17.4	983	791	5.9	59.8	—	2.4	—	—	3.8	109.4	—	29.5	1,152	791.3
1961	40.0	841	964	8.1	85.7	—	37.6	—	—	3.1	224.4	—	88.8	1,151	964.5
1962	20.3	818	988	4.6	68.6	—	32.1	1.0	—	2.3	337.2	—	59.3	1,225	988.1
1963	26.9	781	1,340	5.1	76.1	—	59.5	3.7	5.5	1.9	252.6	—	93.4	1,114	1,345.9
1964	16.6	726	1,123	6.3	92.8	—	42.1	0.2	6.9	2.2	416.6	—	67.2	1,235	1,129.7
1965	13.8	778	779	5.2	100.5	—	42.9	—	55.1	2.6	480.1	—	64.5	1,359	834.5
1966	43.2	899	925	3.3	75.8	54.8	64.9	—	—	5.3	404.1	—	116.7	1,379	979.8
1967	34.9	865	1,189	4.5	65.9	9.4	143.0	5.0	—	2.9	226.0	—	185.3	1,162	1,198.3
1968	41.4	804	1,141	2.7	65.4	68.9	113.2	—	—	3.9	194.0	—	161.2	1,063	1,209.5

Source: Trade of Canada. Exports, D.B.S. 65-202.

<sup>a</sup>Prior to 1961, bolts not included.



TABLE 47. CONVERSION OF PRODUCT VOLUMES TO ROUNDWOOD EQUIVALENT

Product	Product Unit	Roundwood Conversion	1975		1980	
			Product Volume	Roundwood Equivalent	Product Volume	Roundwood Equivalent
		cu ft		MM ft <sup>3</sup>		MM ft <sup>3</sup>
Newsprint	M Tons	113.5/Ton	9,545	1,083.358	10,755	1,220.693
Printing Paper	M Tons	136.5/Ton	510	69.156	656	88.954
Fine Paper	M Tons	136.5/Ton	448	60.749	582	78.919
Tissue and Sanitary Paper	M Tons	177.7/Ton	404	71.791	548	97.380
Wrapping Paper	M Tons	187.9/Ton	557	104.660	677	127.208
Industrial Papers <sup>a</sup>	M Tons	53.3/Ton	103	5.490	92	4.904
Paperboard <sup>a</sup>	M Tons	99.2/Ton	2,463	244.330	3,107	308.214
Building Board <sup>a</sup>	M Tons	65 /Ton	452	29.380	516	33.540
Logs and Bolts for Export	MM fbm	177 /M fbm	143	25.311	147	26.019
Pulpwood for Export	M cds	85 /cd	1,150	97.750	1,115	94.775
General Primary Wood Products	M ft <sup>3</sup>	1 /1	215	.215	208	.208
Railroad Ties	M pieces	4.8/ea	4,444	21.331	4,444	21.331
Flatted Mine Timbers	M pieces	4.4/ea	742	3.265	742	3.265
Softwood Lumber	MM bd ft	158 /M bd ft	12,182	1,924.756	13,811	2,182.138
Hardwood Lumber	MM bd ft	189 /M bd ft	678	128.142	717	135.513
Softwood Veneer (export only)	MM ft <sup>2</sup> (1/10)	12.8/M ft <sup>2</sup>	35	.448	35	.448
Hardwood Veneer	MM ft <sup>2</sup> (1/10)	12.8/M ft <sup>2</sup>	544	6.963	625	8.000
Softwood Plywood	MM ft <sup>2</sup> (3/8)	57 /M ft <sup>2</sup>	2,692	153.444	3,166	180.462
Hardwood Plywood	MM ft <sup>2</sup> (3/8)	63 /M ft <sup>2</sup>	809	50.967	1,121	70.623
Hardwood Flooring	MM bd ft	189 M/ bd ft	105	19.845	114	21.546
Shingles and Shakes	M squares	20 /ea	2,287	45.740	2,282	45.640
Misc. Sawn Products	MM bd ft	160 /M bd ft	57	9.120	60	9.600
Woodpulp (D&A) for Export	M Tons	220 /Ton	428	94.160	466	102.520
Woodpulp (Other) for Export	M Tons	156 /Ton	5,190	809.640	6,425	1,002.300
Subtotal				5,060.011		5,864.200
Wood Residue Consumed				860.000		950.000
TOTAL				4,200.011		4,914.200

<sup>a</sup>These products of waste and non-wood raw materials are not included in roundwood requirements.

1985		1990		1995		2000	
Product Volume	Roundwood Equivalent	Product Volume	Roundwood Equivalent	Product Volume	Roundwood Equivalent	Product Volume	Roundwood Equivalent
	MM ft <sup>3</sup>		MM ft <sup>3</sup>		MM ft <sup>3</sup>		MM ft <sup>3</sup>
11,967	1,358.255	13,178	1,495.703	14,318	1,625.093	15,345	1,741.658
795	107.802	990	134.244	1,215	164.754	1,391	188.620
740	100.344	927	125.701	1,104	149.702	1,223	165.839
693	123.146	901	160.108	1,155	205.244	1,334	237.052
814	152.951	947	177.941	1,058	198.798	1,173	220.407
86	4.584	74	3.944	57	3.038	38	2.025
3,856	382.515	4,746	470.803	5,579	553.437	6,162	611.270
572	37.180	636	41.340	693	45.045	756	59.140
157	27.789	156	27.612	160	28.320	161	28.497
1,080	91.800	1,050	89.250	1,015	86.275	990	84.150
204	.204	203	.203	204	.204	204	.204
4,439	21.307	4,428	21.254	4,222	21.226	4,411	21.173
742	3.265	742	3.265	742	3.265	742	3.265
15,259	2,410.922	16,594	2,621.852	17,927	2,832.466	19,265	3,043.870
756	142.884	797	150.633	837	158.193	877	165.753
30	.384	30	.384	30	.384	30	.384
717	9.178	803	10.278	893	11.430	974	12.467
3,731	212.667	4,442	253.194	5,199	296.343	6,145	350.265
1,492	93.996	1,946	122.598	2,369	149.247	2,640	166.320
128	24.192	142	26.838	157	29.673	169	31.941
2,276	45.520	2,275	45.500	2,265	45.300	2,259	45.180
65	10.400	69	11.040	72	11.520	75	12.000
494	108.680	523	115.060	561	123.420	584	128.480
7,555	1,178.580	8,535	1,331.460	9,465	1,476.540	11,055	1,724.580
	6,648.545		7,440.205		8,218.917		9,044.540
	1,000.000		1,200.000		1,350.000		1,420.000
	5,648.545		6,240.205		6,868.917		7,624.540

TABLE 48. MERCHANTABLE TIMBER BY PROVINCES,<sup>a</sup> 1968 INVENTORIED NONRESERVED FOREST LAND ONLY  
(ALL MATURITY CLASSES)

	NEWFOUNDLAND		PRINCE EDWARD ISLAND		NOVA SCOTIA		NEW BRUNSWICK		QUEBEC	
	Allocated	Not Allocated	Allocated	Not Allocated	Allocated	Not Allocated	Allocated	Not Allocated	Allocated	Not Allocated
millions of cubic feet										
<b>SOFTWOODS</b>										
Spruce	1,501	—	72	—	3,382	—	5,180	—	32,189	28,186
Balsam Fir	2,509	—	23	—	1,934	—	5,151	—	21,142	5,264
Douglas Fir	—	—	—	—	—	—	—	—	—	—
Hemlock	—	—	—	—	280	—	153	—	537	—
White Pine	—	—	—	—	348	—	385	—	1,147	—
Red Pine	—	—	—	—	31	—	46	—	244	—
Jack and Lodgepole Pines	—	—	—	—	3	—	262	—	2,368	3,017
Ponderosa Pine	—	—	—	—	—	—	—	—	—	—
Cedar	—	—	—	—	1	—	698	—	2,700	—
Larch (Tamarack)	—	—	—	—	—	—	—	—	—	—
Yellow Cypress	—	—	—	—	—	—	—	—	—	—
Other Softwoods	—	—	3	—	66	—	72	—	119	41
<b>TOTAL</b>	<b>4,010</b>	<b>—</b>	<b>98</b>	<b>—</b>	<b>6,045</b>	<b>—</b>	<b>11,947</b>	<b>—</b>	<b>60,446</b>	<b>36,508</b>
<b>HARDWOODS</b>										
Poplar	—	—	3	—	69	—	617	—	2,305	914
White Birch	—	—	18	—	177	—	691	—	9,383	3,664
Yellow Birch	—	—	— <sup>b</sup>	—	449	—	713	—	7,517	—
Maple	—	—	28	—	1,421	—	2,168	—	7,069	—
Beech	—	—	2	—	225	—	618	—	1,660	—
Elm	—	—	—	—	1	—	—	—	57	—
Ash	—	—	—	—	94	—	—	—	342	—
Basswood	—	—	—	—	—	—	114	—	355	—
Oak	—	—	—	—	80	—	—	—	—	—
Other Hardwoods	—	—	1	—	23	—	—	—	177	—
<b>TOTAL</b>	<b>—</b>	<b>—</b>	<b>52</b>	<b>—</b>	<b>2,539</b>	<b>—</b>	<b>4,921</b>	<b>—</b>	<b>28,865</b>	<b>4,578</b>
<b>ALL SPECIES TOTAL</b>	<b>4,010</b>	<b>—</b>	<b>150</b>	<b>—</b>	<b>8,584</b>	<b>—</b>	<b>16,868</b>	<b>—</b>	<b>89,311</b>	<b>41,086</b>

<sup>a</sup>No global inventories were available for the Yukon and Northwest Territories.

<sup>b</sup>Included with White Birch.

<sup>c</sup>Mature timber only.

ONTARIO		MANITOBA		SASKATCHEWAN		ALBERTA		BRITISH COLUMBIA <sup>c</sup>		CANADA	
Allocated	Not Allocated	Allocated	Not Allocated	Allocated	Not Allocated	Allocated	Not Allocated	Allocated	Not Allocated	Allocated	Not Allocated
millions of cubic feet											
27,679	9,733	5,932	1,483	2,277	3,239	17,708	1,274	46,300	18,829	142,220	62,744
5,984	767	358	90	71	139	1,109	80	41,815	6,406	80,096	12,746
—	—	—	—	—	—	—	—	13,370	5,772	13,370	5,772
1,128	—	—	—	—	—	—	—	49,906	9,429	52,004	9,429
3,150	—	—	—	—	—	—	—	850	152	5,880	152
900	—	—	—	—	—	—	—	—	—	1,221	—
12,662	2,130	1,621	405	1,668	2,371	14,785	1,063	28,204	6,460	61,573	15,446
—	—	—	—	—	—	—	—	287	61	287	61
2,299	18	19	5	—	—	—	—	24,550	4,188	30,267	4,211
—	—	62	16	—	—	—	—	565	85	627	101
—	—	—	—	—	—	—	—	3,791	293	3,791	293
95	48	—	—	63	85	—	—	—	—	418	174
53,897	12,696	7,992	1,999	4,079	5,834	33,602	2,417	209,638	51,675	391,754	111,129
19,155	2,019	1,844	461	2,080	4,583	20,060	3,498	2,026	2,258	48,159	13,733
10,883	1,080	330	82	126	276	—	—	482	178	22,090	5,280
3,349	—	—	—	—	—	—	—	—	—	12,028	—
5,630	—	—	—	—	16	—	—	16	24	16,332	40
490	—	—	—	—	—	—	—	—	—	2,995	—
829	—	—	—	—	5	—	—	—	—	887	5
461	—	—	—	—	1	—	—	—	—	897	1
298	—	—	—	—	—	—	—	—	—	767	—
396	—	—	—	—	—	—	—	—	—	476	—
240	—	37	9	—	—	—	—	1,005	1,333	1,483	1,342
41,731	3,099	2,211	552	2,206	4,881	20,060	3,498	3,529	3,793	106,114	20,401
95,628	15,795	10,203	2,551	6,285	10,715	53,662	5,915	213,167	55,468	497,868	131,530

TABLE 49. MERCHANTABLE TIMBER BY MATURITY CLASSES, 1968, INVENTORIED NONRESERVED FOREST LAND ONLY

	NEW- FOUNDLAND <sup>a</sup>	PRINCE EDWARD ISLAND	NOVA- SCOTIA	NEW- BRUNSWICK	QUEBEC	ONTARIO	MANITOBA	SASKAT- CHEWAN	ALBERTA	BRITISH COLUMBIA <sup>b</sup>	CANADA <sup>c</sup>
millions of cubic feet											
<b>SOFTWOODS</b>											
<b>Spruce</b>											
Young growth	—	[ 48 ]	—	774	[ 9,619 ]	—	—	164	3,638	—	—
Immature	25	—	—	3,206	—	7,996	—	2,796	9,689	—	—
Mature	1,075	[ 24 ]	—	677	[ 50,756 ]	29,415	—	1,773	4,214	65,129	—
Overmature	401	—	—	—	—	—	—	783	1,441	—	—
Uneven aged	—	—	—	[ 523 ]	—	1	—	—	—	—	—
<b>TOTAL</b>	<b>1,501</b>	<b>72</b>	<b>3,382</b>	<b>5,180</b>	<b>60,375</b>	<b>37,412</b>	<b>7,415</b>	<b>5,516</b>	<b>18,982</b>	<b>65,129</b>	<b>204,964</b>
<b>Balsam Fir</b>											
Young growth	—	[ 23 ]	—	766	[ 4,259 ]	—	—	1	180	—	—
Immature	20	—	—	3,039	—	1,870	—	58	540	—	—
Mature	406	—	—	770	[ 22,147 ]	4,880	—	94	360	48,221	—
Overmature	2,083	—	—	—	—	—	—	57	108	—	—
Uneven aged	—	—	—	[ 576 ]	—	2	—	—	—	—	—
<b>TOTAL</b>	<b>2,509</b>	<b>23</b>	<b>1,934</b>	<b>5,151</b>	<b>26,406</b>	<b>6,752</b>	<b>448</b>	<b>210</b>	<b>1,188</b>	<b>48,221</b>	<b>92,842</b>
<b>Douglas Fir</b>											
Young growth	—	—	—	—	—	—	—	—	—	—	—
Immature	—	—	—	—	—	—	—	—	—	—	—
Mature	—	—	—	—	—	—	—	—	—	19,142	—
Overmature	—	—	—	—	—	—	—	—	—	—	—
Uneven	—	—	—	—	—	—	—	—	—	—	—
<b>TOTAL</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>19,142</b>	<b>19,142</b>
<b>Hemlock</b>											
Young growth	—	—	—	24	[ 82 ]	—	—	—	—	—	—
Immature	—	—	—	75	—	573	—	—	—	—	—
Mature	—	—	—	22	[ 445 ]	535	—	—	—	59,335	—
Overmature	—	—	—	—	—	—	—	—	—	—	—
Uneven aged	—	—	—	[ 32 ]	—	20	—	—	—	—	—
<b>TOTAL</b>	<b>—</b>	<b>—</b>	<b>280</b>	<b>153</b>	<b>537</b>	<b>1,128</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>59,335</b>	<b>61,433</b>
<b>White Pine</b>											
Young growth	—	—	—	41	[ 174 ]	—	—	—	—	—	—
Immature	—	—	—	187	—	1,640	—	—	—	—	—
Mature	—	—	—	72	[ 973 ]	1,492	—	—	—	1,002	—
Overmature	—	—	—	—	—	—	—	—	—	—	—
Uneven aged	—	—	—	[ 85 ]	—	18	—	—	—	—	—
<b>TOTAL</b>	<b>—</b>	<b>—</b>	<b>348</b>	<b>385</b>	<b>1,147</b>	<b>3,150</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>1,002</b>	<b>6,032</b>
<b>Red Pine</b>											
Young growth	—	—	—	1	[ 37 ]	—	—	—	—	—	—
Immature	—	—	—	38	—	468	—	—	—	—	—
Mature	—	—	—	6	[ 207 ]	432	—	—	—	—	—
Overmature	—	—	—	—	—	—	—	—	—	—	—
Uneven aged	—	—	—	[ 1 ]	—	—	—	—	—	—	—
<b>TOTAL</b>	<b>—</b>	<b>—</b>	<b>31</b>	<b>46</b>	<b>244</b>	<b>900</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>1,221</b>

<sup>a</sup>Newfoundland, Island only.<sup>b</sup>British Columbia reports mature volumes only.<sup>c</sup>Not including the Yukon and Northwest Territories, where no overall inventory is available.

TABLE 49. MERCHANTABLE TIMBER BY MATURITY CLASSES, 1968, INVENTORIED NONRESERVED FOREST LAND ONLY (Continued)

	NEW- FOUNDLAND <sup>a</sup>	PRINCE EDWARD ISLAND	NOVA- SCOTIA	NEW- BRUNSWICK	QUEBEC	ONTARIO	MANITOBA	SASKAT- CHEWAN	ALBERTA	BRITISH COLUMBIA <sup>b</sup>	CANADA <sup>c</sup>
millions of cubic feet											
<b>SOFTWOODS (Continued)</b>											
Jack and Lodgepole Pine											
Young growth	—	—	—	83	[ 836 ]	—	—	335	3,746	—	
Immature	—	—	—	158	—	5,877	—	1,968	8,788	—	
Mature	—	—	—	13	[ 4,549 ]	8,916	—	1,678	2,629	34,664	
Overmature	—	—	—	[ 8 ]	—	—	—	58	684	—	
Uneven aged	—	—	—	—	—	—	—	—	—	—	
TOTAL	—	—	3	262	5,385	14,793	2,026	4,039	15,847	34,664	77,019
Ponderosa Pine											
Young growth	—	—	—	—	—	—	—	—	—	—	
Immature	—	—	—	—	—	—	—	—	—	—	
Mature	—	—	—	—	—	—	—	—	—	348	
Overmature	—	—	—	—	—	—	—	—	—	—	
Uneven aged	—	—	—	—	—	—	—	—	—	—	
TOTAL	—	—	—	—	—	—	—	—	—	348	348
Cedar											
Young growth	—	—	—	92	[ 411 ]	—	—	—	—	—	
Immature	—	—	—	484	—	997	—	—	—	—	
Mature	—	—	—	88	[ 2,289 ]	1,298	—	—	—	28,738	
Overmature	—	—	—	[ 34 ]	—	—	—	—	—	—	
Uneven aged	—	—	—	—	—	22	—	—	—	—	
TOTAL	—	—	1	698	2,700	2,317	24	—	—	28,738	34,478
Yellow Cedar											
Young growth	—	—	—	—	—	—	—	—	—	—	
Immature	—	—	—	—	—	—	—	—	—	—	
Mature	—	—	—	—	—	—	—	—	—	4,084	
Overmature	—	—	—	—	—	—	—	—	—	—	
Uneven aged	—	—	—	—	—	—	—	—	—	—	
TOTAL	—	—	—	—	—	—	—	—	—	4,084	4,084
Other											
Young growth	—	[ 2 ]	—	34	[ 25 ]	—	—	20	—	—	
Immature	—	—	—	35	—	70	—	107	—	—	
Mature	—	—	—	2	[ 135 ]	73	—	20	—	650	
Overmature	—	—	—	[ 1 ]	—	—	—	1	—	—	
Uneven aged	—	—	—	—	—	1	—	—	—	—	
TOTAL	—	2	66	72	160	144	78	148	—	650	1,320
TOTAL, ALL SOFTWOODS	4,010	97	6,045	11,947	96,954	66,596	9,991	9,913	36,017	261,313	502,883
<b>HARDWOODS</b>											
Poplar											
Young growth	—	[ 2 ]	—	164	[ 521 ]	—	—	157	8,127	—	
Immature	—	—	—	348	—	8,090	—	1,734	11,473	—	
Mature	—	[ 1 ]	—	43	[ 2,698 ]	13,058	—	3,375	3,298	4,284	
Overmature	—	—	—	[ 62 ]	—	—	—	1,397	660	—	
Uneven aged	—	—	—	—	—	26	—	—	—	—	
TOTAL	—	3	69	617	3,219	21,174	2,305	6,663	23,558	4,284	61,892

<sup>a</sup>Newfoundland, Island only.<sup>b</sup>British Columbia reports mature volumes only.<sup>c</sup>Not including the Yukon and Northwest Territories, where no overall inventory is available.



TABLE 49. MERCHANTABLE TIMBER BY MATURITY CLASSES, 1968, INVENTORIED NONRESERVED FOREST LAND ONLY (Continued)

	NEW- FOUNDLAND <sup>a</sup>	PRINCE EDWARD ISLAND	NOVA- SCOTIA	NEW- BRUNSWICK	QUEBEC	ONTARIO	MANITOBA	SASKAT- CHEWAN	ALBERTA	BRITISH COLUMBIA <sup>b</sup>	CANADA <sup>c</sup>
millions of cubic feet											
<b>HARDWOODS (Continued)</b>											
<b>White Birch</b>											
Young growth	[ 17 ]	—	108	[ 2,102 ]	—	—	—	17	—	—	—
Immature	—	—	401	—	4,622	—	—	131	—	—	—
Mature	[ 1 ]	—	95	—	7,332	—	—	196	—	660	—
Overmature	—	—	[ 87 ]	[ 10,945 ]	—	—	—	58	—	—	—
Uneven aged	—	—	—	—	8	—	—	—	—	—	—
TOTAL	18	177	691	13,047	11,962	412	402	—	—	660	27,369
<b>Yellow Birch</b>											
Young growth	Included	—	36	[ 1,143 ]	—	—	—	—	—	—	—
Immature	—	—	271	—	987	—	—	—	—	—	—
Mature	With	—	219	—	2,348	—	—	—	—	—	—
Overmature	WHITE	—	[ 187 ]	[ 6,374 ]	—	—	—	—	—	—	—
Uneven aged	—	—	—	—	14	—	—	—	—	—	—
TOTAL	BIRCH	449	713	7,517	3,349	—	—	—	—	—	12,028
<b>Maple</b>											
Young growth	[ 26 ]	—	168	[ 1,076 ]	—	—	—	—	—	—	—
Immature	—	—	1,006	—	2,646	—	—	1	—	—	—
Mature	[ 2 ]	—	576	—	2,766	—	—	10	—	40	—
Overmature	—	—	[ 418 ]	[ 5,993 ]	—	—	—	5	—	—	—
Uneven aged	—	—	—	—	218	—	—	—	—	—	—
TOTAL	28	1,421	2,168	7,069	5,630	—	16	—	—	40	16,372
<b>Beech</b>											
Young growth	[ 2 ]	—	25	[ 252 ]	—	—	—	—	—	—	—
Immature	—	—	258	—	274	—	—	—	—	—	—
Mature	—	—	155	—	179	—	—	—	—	—	—
Overmature	—	—	[ 180 ]	[ 1,408 ]	—	—	—	—	—	—	—
Uneven aged	—	—	—	—	37	—	—	—	—	—	—
TOTAL	2	225	618	1,660	490	—	—	—	—	—	2,995
<b>Elm</b>											
Young growth	—	—	—	[ 9 ]	—	—	—	—	—	—	—
Immature	—	—	—	—	465	—	—	1	—	—	—
Mature	—	—	—	—	195	—	—	4	—	—	—
Overmature	—	—	—	[ 48 ]	—	—	—	—	—	—	—
Uneven aged	—	—	—	—	169	—	—	—	—	—	—
TOTAL	—	1	—	57	829	—	5	—	—	—	892
<b>Ash</b>											
Young growth	—	—	—	[ 52 ]	—	—	—	—	—	—	—
Immature	—	—	—	—	330	—	—	1	—	—	—
Mature	—	—	—	—	91	—	—	—	—	—	—
Overmature	—	—	—	[ 290 ]	—	—	—	—	—	—	—
Uneven aged	—	—	—	—	40	—	—	—	—	—	—
TOTAL	—	94	—	342	461	—	1	—	—	—	898

<sup>a</sup>Newfoundland, Island only.<sup>b</sup>British Columbia reports mature volumes only.<sup>c</sup>Not including the Yukon and Northwest Territories, where no overall inventory is available.

TABLE 49. MERCHANTABLE TIMBER BY MATURITY CLASSES, 1968, INVENTORIED NONRESERVED FOREST LAND ONLY (Concluded)

	NEW- FOUNDLAND <sup>a</sup>	PRINCE EDWARD ISLAND	NOVA- SCOTIA	NEW- BRUNSWICK	QUEBEC	ONTARIO	MANITOBA	SASKAT- CHEWAN	ALBERTA	BRITISH COLUMBIA <sup>b</sup>	CANADA <sup>c</sup>
millions of cubic feet											
<b>HARDWOODS (Continued)</b>											
Basswood											
Young growth	—	—	—	25	[ 54 ]	—	—	—	—	—	—
Immature	—	—	—	52	—	182	—	—	—	—	—
Mature	—	—	—	13	—	86	—	—	—	—	—
Overmature	—	—	—	—	[ 301 ]	—	—	—	—	—	—
Uneven aged	—	—	—	[ 24 ]	—	30	—	—	—	—	—
TOTAL	—	—	—	114	355	298	—	—	—	—	767
Oak											
Young growth	—	—	—	—	—	—	—	—	—	—	—
Immature	—	—	—	—	—	315	—	—	—	—	—
Mature	—	—	—	—	—	42	—	—	—	—	—
Overmature	—	—	—	—	—	—	—	—	—	—	—
Uneven aged	—	—	—	—	—	40	—	—	—	—	—
TOTAL	—	—	80	—	—	397	—	—	—	—	477
Other											
Young growth	[ 1 ]	—	—	—	[ 27 ]	—	—	—	—	—	—
Immature	—	—	—	—	—	175	—	—	—	—	—
Mature	—	—	—	—	—	43	—	—	—	—	—
Overmature	—	—	—	—	[ 150 ]	—	—	—	—	2,338	—
Uneven aged	—	—	—	—	—	22	—	—	—	—	—
TOTAL	1	—	23	—	177	240	46	—	—	2,338	2,825
TOTAL, ALL HARDWOODS	52	—	2,539	4,921	33,443	44,830	2,763	7,087	23,558	7,322	126,515

<sup>a</sup>Newfoundland, Island only.<sup>b</sup>British Columbia reports mature volumes only.<sup>c</sup>Not including the Yukon and Northwest Territories, where no overall inventory is available.

TABLE 50. DEPLETION BY CUTTING AND FIRE, NONRESERVED FOREST LAND ONLY, AREA ANALYSIS<sup>a</sup>

	NEWFOUNDLAND (ISLAND)			NEWFOUNDLAND (LABRADOR)			PRINCE EDWARD ISLAND			NOVA SCOTIA			NEW BRUNSWICK		
	Area	Cutover	Fire	Area	Cutover	Fire	Area	Cutover	Fire	Area	Cutover	Fire	Area	Cutover	Fire
thousands of acres															
Allocated to Wood Production	3,029	—	0.5	21,565	—	14	7	—	—	2,021	10	—	7,435	88	7
Not Allocated to Wood Production	—	—	—	—	—	—	—	—	—	—	—	4	21	—	—
Private	5,599	39	1.2	—	—	—	610	4	3	7,594	90	—	8,153	111	12
TOTAL	8,628	39	1.7	21,565	—	14	617	4	3	9,615	100	4	15,609	199	19

	QUEBEC			ONTARIO			MANITOBA			SASKATCHEWAN			ALBERTA		
	Area	Cutover	Fire	Area	Cutover	Fire	Area	Cutover	Fire	Area	Cutover	Fire	Area	Cutover	Fire
thousands of acres															
Allocated to Wood Production	66,081	502	202	93,978	371	21	27,439	25	126	7,016	27	33	46,003	52	63
Not Allocated to Wood Production	87,816	—	—	10,135	—	—	6,766	—	8	16,489	18	75	14,365	10	20
Private	17,868	110	—	11,463	—	6	3,703	4	8	947	6	4	1,859	—	—
TOTAL	171,765	612	202	115,576	371	27	37,908	29	142	24,452	51	112	62,227	62	83

	BRITISH COLUMBIA			YUKON			NORTHWEST TERRITORIES			CANADA — TOTAL		
	Area	Cutover	Fire	Area	Cutover	Fire	Area	Cutover	Fire	Area	Cutover	Fire
thousands of acres												
Allocated to Wood Production	96,021	318	82	51	1	—	—	—	—	370,646	1,394	552.5
Not Allocated to Wood Production	32,409	209	27	51,917	—	80	124,544	—	—	344,462	237	210.0
Private	6,408	45	6	—	—	—	—	—	—	64,204	409	40.2
TOTAL	134,838	572	115	51,968	1	80	124,544	—	—	779,312	2,040	802.7

<sup>a</sup> 5-year average, 1964-1968, inclusive.<sup>b</sup> Alberta figures for fire area include seismic clearing of 29,000 acres of allocated land and 9,000 acres of nonallocated land.

TABLE 51. AREAS OF FOREST BY MATURITY CLASSES, 1968 (Only the inventoried or estimated portions of nonreserved forest land are included in the table<sup>a</sup>)

MATURITY CLASS	NEWFOUNDLAND			PRINCE EDWARD ISLAND			NOVA SCOTIA			NEW BRUNSWICK			QUEBEC			ONTARIO		
	Area	Combined	Percent	Area	Combined	Percent	Area	Combined	Percent	Area	Combined	Percent	Area	Combined	Percent	Area	Combined	Percent
thousands of acres																		
Young growth	1,412			— <sup>b</sup>			555			3,096			—			—		
		2,038	37.1		388	73.9		2,048	21.2		11,329	80.2		69,567	45.2		57,191	54.3
Immature	626			—			1,493			8,233			—			—		
Mature	911			—			6,163			1,978			—			—		
Overmature	2,378	3,457	62.9	—	137	26.1	1,347	7,608	78.8	<sup>c</sup>	2,794	19.8	—	84,398	54.8	—	48,071	45.7
Uneven aged	168			—			98			816			—			—		
TOTAL	5,495		100.0	525		100.0	9,656		100.0	14,123		100.0	153,965		100.0	105,262		100.0
thousands of acres																		
MATURITY CLASS	MANITOBA			SASKATCHEWAN			ALBERTA			BRITISH COLUMBIA			YUKON-NORTHWEST TERRITORIES			CANADA		
	Area	Combined	Percent	Area	Combined	Percent	Area	Combined	Percent	Area	Combined	Percent	Area	Combined	Percent	Area	Combined	Percent
thousands of acres																		
Young growth	9,158			5,636			21,717			—						—		
		22,437	61.3		13,308	73.9		35,390	88.0		61,798	50.2					275,494	54.3
Immature	13,279			7,672			13,673			—			Data not available			—		
Mature	8,974			3,753			4,022									—		
Overmature	5,219	14,193	38.7	939	4,692	26.1	804	4,826	12.0	—	61,196	49.8				—		
Uneven aged	<sup>c</sup>			<sup>c</sup>			<sup>c</sup>			—						—	231,372	45.7
TOTAL	36,630		100.0	18,000		100.0	40,216		100.0	122,994		100.0				506,866		100.0

<sup>a</sup>Inadequately stocked lands are included in the figures except for the province of British Columbia, which reported separately approximately 12 million acres of forest land inadequately stocked, and Newfoundland, which reported 100,000 acres in the same category. Areas reported by New Brunswick were only those non-federal lands with natural forest stands adequately stocked and suitable for regular harvest. An additional 983,000 acres were inadequately stocked, and the remainder unclassified. Nova Scotia figures include 41,000 acres of federal land designated for other uses.

<sup>b</sup>Data are not available; combined only are available.

<sup>c</sup>Class not used in provincial data.

TABLE 52. PRIMARY FOREST PRODUCTION, BY PROVINCES, SHOWN WITH 5-YEAR AVERAGES, 1944 TO 1968

	NEW- FOUN- LAND	PRINCE EDWARD ISLAND	NOVA SCOTIA	NEW BRUNS- WICK	QUEBEC	ONTARIO	MANI- TOBA	SASKAT- CHEWAN	ALBERTA	BRITISH COLUMBIA	YUKON NORTH TERRI- TORIES	TOTAL
thousands of cubic feet												
1944		11,495	108,680	194,520	997,669	446,256	71,083	112,200	135,504	568,967	3,834	2,650,208
1945		11,237	115,272	182,077	1,071,795	453,756	62,659	101,599	127,611	564,616	1,578	2,692,200
1946	Not	11,168	122,787	219,449	1,072,959	530,120	61,754	87,627	132,874	580,353	2,844	2,821,935
1947	Available	10,867	139,731	246,521	1,054,300	593,475	66,995	89,665	135,843	763,089	3,726	3,104,214
1948		10,123	125,923	243,033	1,054,338	565,229	68,197	82,173	134,036	782,871	3,342	3,069,265
TOTAL		54,890	612,393	1,085,600	5,251,061	2,588,836	330,688	473,264	665,868	3,259,896	15,324	14,337,822
5-YEAR AVERAGE		10,978	122,479	217,120	1,050,212	517,767	66,137	94,653	133,174	651,979	3,064	2,867,564
1949	97,220	9,679	104,251	188,916	857,493	455,483	57,426	66,324	109,103	736,174	3,818	2,685,917
1950	112,647	9,878	116,747	199,067	978,406	516,316	56,860	70,486	127,296	832,535	3,227	3,023,465
1951	120,989	10,968	129,386	282,095	1,141,649	600,396	86,792	73,242	124,727	862,195	4,024	3,436,463
1952	102,275	12,244	117,928	223,651	994,917	564,349	75,954	71,747	128,033	910,058	4,227	3,205,383
1953	113,890	9,988	108,096	190,978	941,450	504,180	60,392	71,680	107,616	965,368	4,428	3,078,066
TOTAL	547,021	52,757	576,408	1,084,707	4,913,915	2,640,724	337,454	353,479	596,775	4,306,330	19,724	15,429,294
5-YEAR AVERAGE	109,404	10,551	115,282	216,941	982,783	528,145	67,491	70,696	119,355	861,266	3,945	3,085,859
1954	99,880	9,052	101,422	175,948	1,004,188	497,261	62,035	65,326	107,237	996,064	3,900	3,122,313
1955	112,392	11,259	118,588	202,645	984,111	542,031	56,646	55,225	113,511	1,080,758	2,904	3,280,070
1956	104,987	10,314	111,202	258,562	1,074,032	547,354	67,215	58,184	114,689	1,109,919	6,846	3,463,304
1957	97,660	9,065	104,859	201,847	905,446	565,010	60,337	55,088	125,938	1,042,561	4,355	3,172,166
1958	83,959	10,565	83,283	172,215	816,797	483,544	50,377	41,561	107,612	998,827	5,930	2,854,670
TOTAL	498,878	50,255	519,354	1,011,217	4,784,574	2,635,200	296,610	275,384	568,987	5,228,129	23,935	15,892,523
5-YEAR AVERAGE	99,776	10,051	103,871	202,243	956,915	527,040	59,322	55,077	113,797	1,045,626	4,787	3,178,505
1959	96,695	10,594	89,612	172,602	877,158	531,528	51,766	44,621	135,003	1,173,965	2,843	3,186,387
1960	126,702	10,834	98,095	187,297	879,914	541,329	45,255	49,860	148,485	1,199,843	5,697	3,293,311
1961	98,014	10,157	96,747	193,346	914,096	494,048	37,602	44,036	118,390	1,167,051	1,815	3,175,302
1962	74,649	5,514	81,907	140,627	876,043	519,414	53,160	47,844	131,706	1,342,936	4,106	3,277,906
1963	89,027	6,045	86,554	198,258	913,542	535,077	41,556	42,091	133,472	1,473,423	3,965	3,523,010
TOTAL	485,087	43,144	452,915	892,130	4,460,753	2,621,396	229,339	228,452	667,056	6,357,218	18,426	16,455,916
5-YEAR AVERAGE	97,017	8,629	90,583	178,426	892,151	524,279	45,868	45,690	133,411	1,271,444	3,685	3,291,183
1964	96,800	6,072	104,640	195,503	933,096	569,767	39,402	39,370	124,475	1,514,595	3,265	3,626,985
1965	98,810	6,685	106,792	195,297	935,709	567,131	42,491	45,403	126,584	1,533,113	2,654	3,660,669
1966	100,414	6,663	108,209	212,621	994,015	600,922	43,407	46,387	130,268	1,602,437	3,676	3,849,019
1967	86,393	5,862	106,923	203,800	999,655	607,085	35,922	64,469	111,265	1,572,599	4,474	3,798,446
1968	83,373	5,715	128,209	238,059	985,445	590,964	39,183	64,584	130,769	1,702,455	3,875	3,972,631
TOTAL	465,790	30,997	554,773	1,045,280	4,847,920	2,935,869	200,405	260,213	623,361	7,925,199	17,944	18,907,750
5-YEAR AVERAGE	93,158	6,199	110,955	209,056	969,584	587,174	40,081	52,043	124,672	1,585,040	3,589	3,781,550

Source: Canadian Forestry Statistics. D.B.S. Cat. No. 25-202 (annual).

TABLE 53. ALLOWABLE CUT FOR INVENTORIED FOREST LAND, 1968

	Allowable Cut		
	On Forest Land Allocated to Timber Production <sup>a</sup>	On Forest Land Not Allocated to Timber Production	On All Forest Land
	M cubic feet <sup>b</sup>		
Newfoundland	145,600	—	145,600
Nova Scotia	250,000	—	250,000
New Brunswick	457,000	—	457,000
Prince Edward Island	3,700	—	3,700
Quebec	1,346,100	902,700	2,248,800
Ontario	2,271,900	353,700	2,625,600
Manitoba	196,100	49,000	245,100
Saskatchewan	148,100	261,900	410,000
Alberta	904,300	90,500	994,800
British Columbia	2,758,000	592,600	3,350,600
Canada <sup>c</sup>	8,480,800	2,250,400	10,731,200

<sup>a</sup>Allocated land is defined as that set aside for wood production and includes land so designated by either the provincial or federal government and also whatever private forest land is inventoried.

<sup>b</sup>Merchantable volume.

<sup>c</sup>Not including the Yukon and Northwest Territories, where no overall inventory is available.

TABLE 54. CUTTING CYCLE FOR INVENTORIED, NONRESERVED FOREST LAND AND AVERAGE VOLUME HARVESTED PER ACRE, 1964-1968

	Inventoried Forest Land	Average Annual Cutover	Theoretical Cutting Cycle	Average Volume Harvested per Acre
	M acres	M acres	years	cubic feet
Newfoundland	5,495	39	140	2,380
Prince Edward Island	525	4	131	1,550
Nova Scotia	9,656	100	96	1,110
New Brunswick	14,123	199	70	1,050
Quebec	153,965	612	251	1,580
Ontario	105,262	371	283	1,580
Manitoba	36,630	29	1,263	1,380
Saskatchewan	18,000	51	352	1,020
Alberta	40,216	62	648	2,010
British Columbia	122,994	572	215	2,770

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