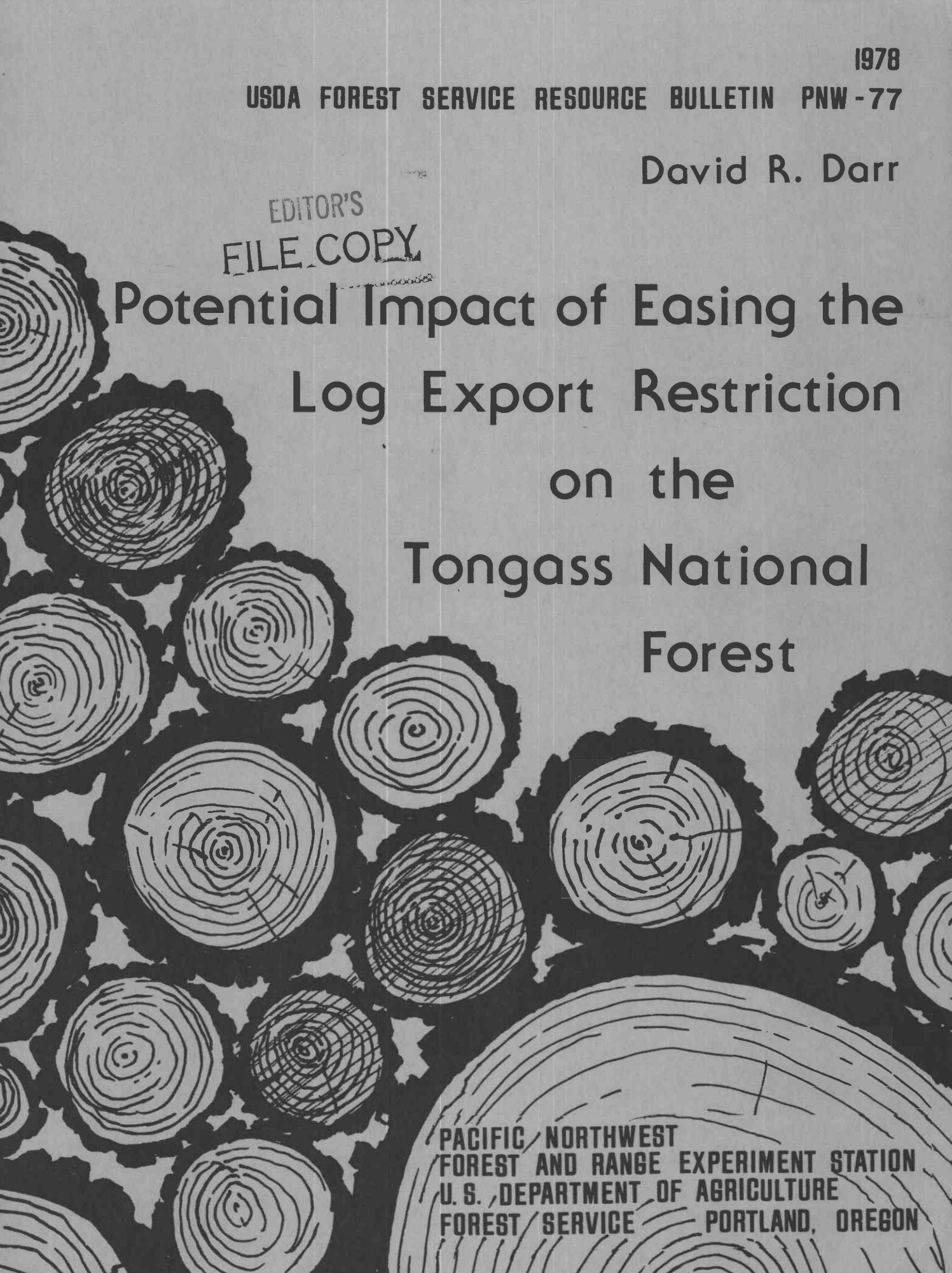
1978
USDA FOREST SERVICE RESOURCE BULLETIN PNW-77

David R. Darr

Potential Impact of Easing the Log Export Restriction on the Tongass National Forest



PACIFIC NORTHWEST
FOREST AND RANGE EXPERIMENT STATION
U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE — PORTLAND, OREGON

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POTENTIAL IMPACTS OF EASING THE LOG EXPORT RESTRICTION ON THE TONGASS NATIONAL FOREST

Reference Abstract

Darr, David R.
1978. Potential impacts of easing the log export restriction on the Tongass National Forest. USDA For. Serv. Resour. Bull. PNW-77, 18 p., illus. Pac. Northwest For. and Range Exp. Stn., Portland, Oregon.

The potential of higher revenues in the log export market is constrained by possible reductions in prices associated with expanded supplies in the Japanese log market. Expanded log exports from the Tongass National Forest might force adjustments by existing cantmills, even under a partial easing of the export restriction.

KEYWORDS: Import/export (forest products), trade policy (international), market prices, supply/demand (forest products), Alaska (Tongass National Forest).

Research Summary

RESOURCE BULLETIN PNW-77
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A longstanding restriction on the export of roundwood logs may restrict the flexibility of the U.S. Forest Service in formulating policies to respond to current competing demands on the timber resource of the Tongass National Forest. Concerns of the agency include stumpage revenues and the stability of existing industry. The potential of higher revenues in the log export market is constrained by possible reductions in prices associated with expanded supplies in the Japanese log market. Expanded log exports from the Tongass National Forest might force adjustments by existing cantmills, even under a partial easing of the export restriction.

BACKGROUND

A longstanding restriction on the management of National Forest lands in southeast Alaska is a prohibition on the export of unprocessed logs beyond the State's borders. Forest Service efforts to control exports date from 1928 (Lindell 1978). The intent of this paper is to lay out a framework for identifying the potential extent of consequences of lifting the restriction on log exports. No attempt, however, is made to weigh these consequences for the purposes of making a recommendation on what log export policy should be. The U.S. Forest Service in southeast Alaska is responsible for rationalizing export and other policies with the goals and objectives of land management. A key to policy formulation, however, is the identification of possible impacts flowing from a change in policy.

The U.S. Forest Service has many objectives in pursuing its land management responsibilities in southeast Alaska. These objectives are not necessarily clearly defined and may conflict. Objectives flow from legislation such as the Multiple Use-Sustained Yield Act of 1960 [74 Stat. 215; 16 U.S.C. 528-531] and the National Forest Management Act of 1976 [P.L. 94-588]. Overlaid on the rather specific guidelines flowing from legislative mandates are rather vague, imprecise national directions related to employment, price stability, economic efficiency, foreign relations, small business, economic growth and development, community stability, and national security. Ideally, analysis of a change in U.S. Forest Service policy would display the consequences of a change in policy for each of the agency's objectives or concerns. For the purposes of this paper the assessment of consequences is limited to two concerns or objectives for managing the Tongass National Forest. Either through public statements or implicitly through its actions, U.S. Forest Service management in southeast Alaska has expressed concern over the stability of existing industry and stumpage revenues. The importance of these two concerns in determing land management policies of the agency depends on the weights attached to them compared with weights given to other concerns.

In regards to the stability of existing industry, the concern is that a change in export policy might threaten the viability of existing industry with coincident adverse impacts on employment, income, and other aspects of community life in southeast Alaska.

The U.S. Forest Service is charged with obtaining fair market value for timber sold from lands under its management. In regard to stumpage revenues, the concern is that the existing export restriction may be constraining the market for the agency's timber to the point of reducing stumpage revenues. An easing of the export restriction might enhance returns to the Treasury.

The impacts of a policy change on the stability of existing industry and on stumpage revenues will depend on how forest products markets respond. The current export restriction can be viewed as a constraint on the actions of producers and consumers which comprise the marketing chain from standing trees to final end use. An understanding of the details of the forest products markets in southeast Alaska is essential to maintain this market perspective: How does the U.S. Forest Service sell timber; who buys it, and where does the finished product go?

Structure of the Timber Market in Southeast Alaska

The U.S. Forest Service currently manages about 90 percent of the timber inventory in southeast Alaska. Over 99 percent of this inventory is classed as softwoods (Hutchison 1968, pp. 64-65). There are some scattered private lands, but most of the remaining 10 percent is under the control of other public agencies. Transportation costs and other factors which isolate Alaska generally prevent the movement of timber from other areas into southeast Alaska. Because of this isolation, the U.S. Forest Service can be viewed as being in a monopoly position in the sale of timber. The agency's behavior, however, does not correspond with what could be expected of a practicing monopolist.

The maximum volume which the U.S. Forest Service can offer for sale each year in southeast Alaska is constrained by a combination of the biological allowable cut and the level of appropriated funds. The annual allowable cut is based on the physical characteristics of each forest and on multiple-use considerations. The level of appropriated funds determines how much operating money the agency has to lay out and administer timber sales and carry on other land management activities. The level of appropriated funds may constrain sales offerings to less than the annual allowable cut.

The U.S. Forest Service, through a timber appraisal process, establishes a minimum appraised price for each sales offering and will not accept any price below this minimum. Each timber sale is advertised and an auction held. Participants in the auction may bid more but not less than the appraised price.

The appraised price for standing timber is calculated as a residual value. In the appraisal process, the U.S. Forest Service makes an assumption about what end products will be manufactured from the standing timber. End product prices are then multiplied by estimates of product yields from the timber sale volume. Estimates of product manufacturing and logging costs and a margin for profit, interest, and risk are then subtracted from the end product value to establish the residual value of the standing timber. This appraisal process does not account for the costs of the agency in growing timber and administering timber sales, and the agency does not attempt to maximize profit through marginal adjustments of price and quantity.

In southeast Alaska, the U.S. Forest Service as timber seller faces a duopsony (two buyers) market structure on the timber buying side. Directly or indirectly, two firms control all of the major timber processing capacity in southeast Alaska. Each of these firms owns one pulpmill and two or more cantmills. Cants are a form of semiprocessed lumber. Rather than the 2 x 4 found in the U.S. market, cants are on the order of 4 x 4 and larger.

The market structure on the purchaser's side of the timber market in southeast Alaska has evolved over time. The first of the current pulpmills was financed by U.S. firms and built at Ketchikan in 1954 (see figure 1 for mill location). The output is currently high-quality woodpulp suitable for use in the manufacture of rayon and cellophane. At the present time most of this market pulp ends up in the lower 48 states. Recent changes in the ownership structure of the mill may result in more of the output going to Japan and other Pacific Rim markets.

The second pulpmill began operations in 1960 at Sitka and marked the direct entry of Japanese capital into the timber market of southeast Alaska (see figure 1

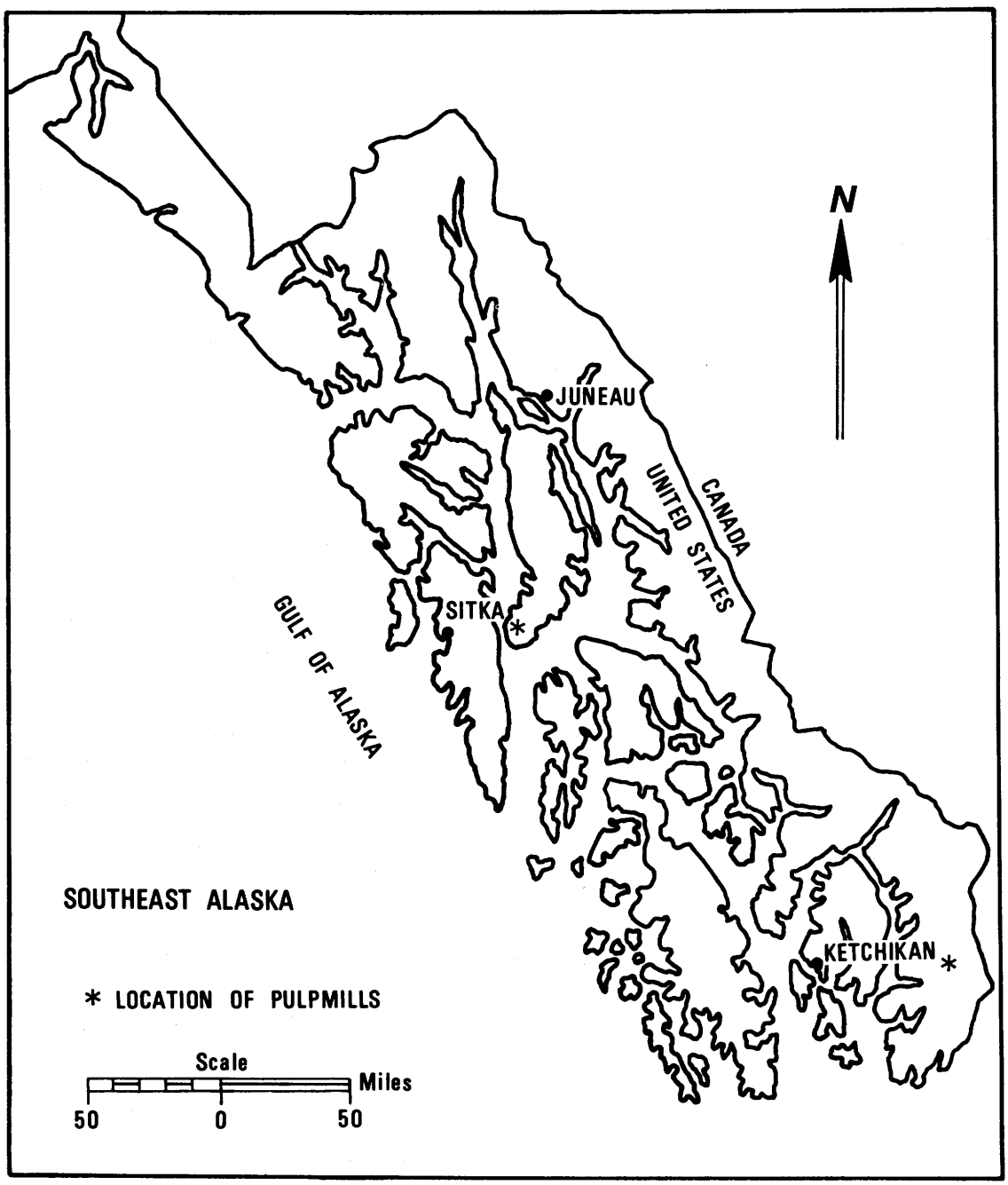

Figure 1.--Map of southeast Alaska east of the 141st meridian.

for mill location). The mill is owned by a consortium of Japanese pulp and paper companies which takes all of the output of the operation. The consortium resells the pulp in Japan.

With the exceptions of small volumes of cedar shipped to Canada and the lower 48 states, output from the cantmills in southeast Alaska goes to Japan. Currently, as has been the case historically, high costs in southeast Alaska and the availability of end products from other competing supply areas have been barriers to the shipment of significant volumes of lumber to markets in the lower 48 states.

As an inducement for the establishment of the pulpmills, the U.S. Forest Service offered to each interested party long-term sales with a 50-year duration. These long-term sales provide over one-half of the timber needed by each of the pulpmills. In addition to volume coming from the two long-term sales, the U.S. Forest Service sells timber in independent sale areas. Currently, the two pulp companies are free to bid on these independent sales.

The geographic separation of the two operations and the stability of timber supply from the two long-term sale areas have led to at least a de facto duopsony situation. If needed, stability of timber supply inherent in the two long-term sale areas gives each of the pulp operations an advantage in bidding for timber on the independent sale areas.

The two pulp companies have discretion over how purchased timber is used. Actual use may not correspond with the end-use assumptions of the Forest Service in the timber appraisal process. Typically, however, higher quality timber is routed to the cantmills and lower quality timber to the pulpmills. There are minimum utilization standards for logging from timber sale areas. These standards are enforced by the Forest Service. The lower quality portion of the timber resource is generally not suited to the manufacture of cants. Small size, rot, and other defects in these logs force their use in the pulpmills. Purchasers of Forest Service timber must have markets for the low-quality portion of the timber sale as well as for the high-quality material. Traditionally, the two pulpmills have provided the only market for low-quality saw logs.

An example of the timber flows in this market is shown in figure 2. The data are for 1974 but are typical of timber flows in recent years. During 1974, a total of 1 324 100 m^3 of the allowable annual cut of 3 624 000 m^3 was not used. Of the timber used, 51.4 percent went to the two pulpmills and the remainder primarily to the cantmills.

Any change in log export policy must work through the timber market depicted in figure 2. To further set the stage for an analysis of the implications of a change in export policy for stumpage revenues and industry stability, we need to look at the current structure of the log market in Japan, the most likely destination for any expanded log export volume from Alaska.

Structure of the Japanese Log Market

Imported logs are used primarily for the manufacture of lumber and plywood (Japan Lumber Journal 1977C, p. 56). Almost all of the imported log volume used for plywood is composed of hardwood species such as lauan. Of the total volume of hardwood log imports amounting to 68.6 million m^3 over the period 1973-75, approximately 58 percent was used for plywood and 42 percent for lumber (Japan

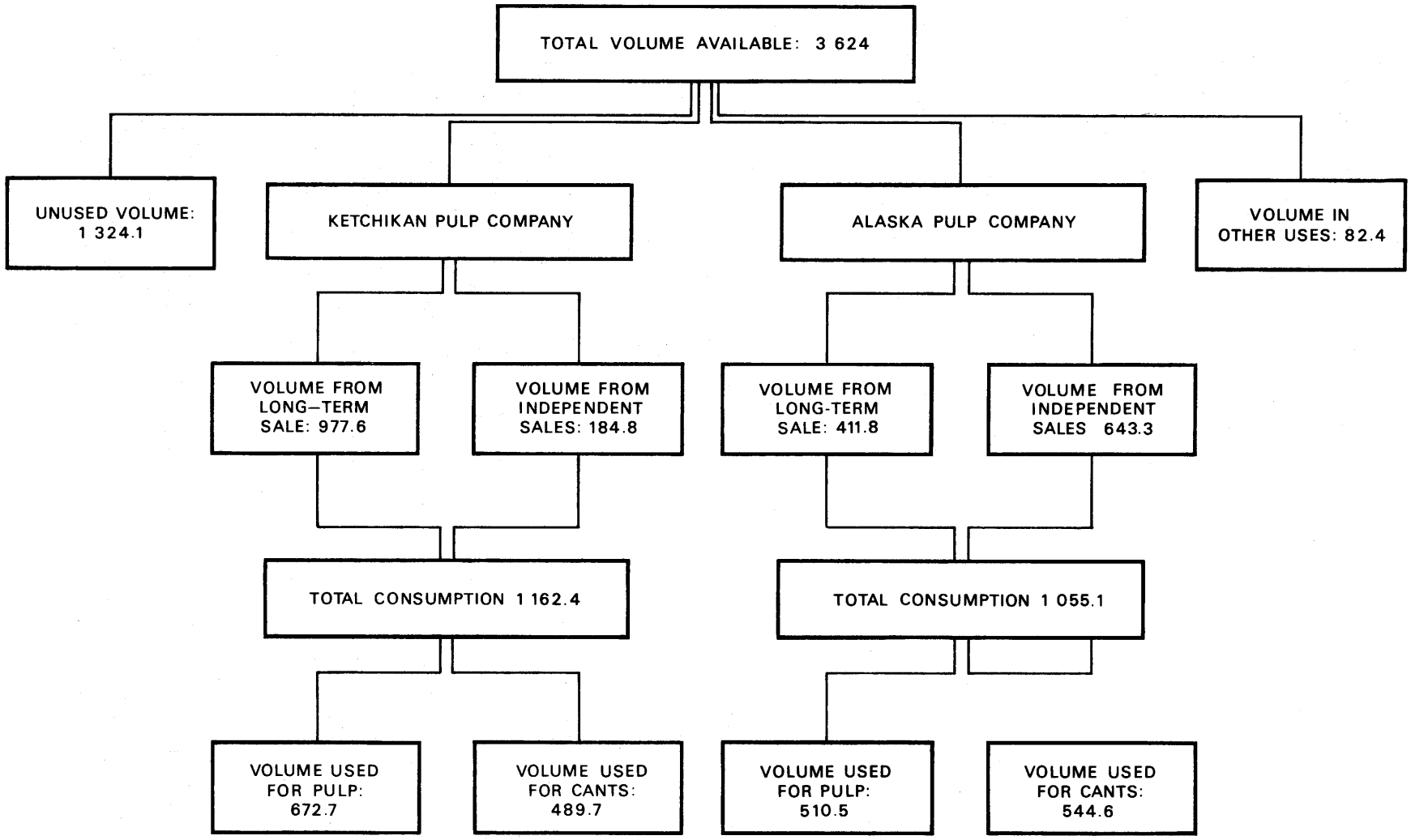

Figure 2.--Log flows in timber market of southeast Alaska, 1974 (Volumes in 1 000 m^3. USDA Forest Service, Region 10, Juneau, Alaska).

Lumber Journal Inc. 1976). Almost all of the imported softwood log volume is consumed in the manufacture of lumber for use in Japan.

The construction industry accounts for about three-fourths of the consumption of lumber of all species. Other major uses are packaging, 8 percent, and furniture and fixtures, 7 percent. Most of the plywood is used for construction purposes or in the manufacture of furniture. Less than 3 percent of Japan's plywood production is exported (Japan Lumber Journal Inc. 1977C, pp. 58-59).

In addition to log imports, lumber imports--primarily softwoods, are a significant source of construction materials in Japan. By the mid-1970's, annual lumber imports amounted to over 4.5 million m^3, about 8 percent of total lumber consumption (Japan Lumber Journal Inc. 1977B).

Plywood and veneer imports, primarily hardwoods from southeast Asia, represent less than 8 percent of Japan's consumption.

Wood flows in the Japanese lumber and plywood industries are depicted in figure 3 for the year 1976. The data are taken from several sources; and there is a problem in making volume estimates comparable among sources, especially for roundwood logs. The data, however, are believed to be reasonable indicators of the magnitudes of wood flows.

Primary sources of softwood logs are domestic forests, the United States, the Union of Soviet Socialist Republics (U.S.S.R.), New Zealand, and Canada. All of the imported softwood log volume is assumed to go to the lumber processing sector. In addition, 9.6 million m^3 of imported hardwood logs, primarily from the Southeast Asian countries of Malaysia, Indonesia, and the Philippines, and 2.9 million m^3 of hardwood logs from domestic sources are assumed to go to the lumber industry. Almost all of the hardwood log input to the plywood industry is from imported sources.

In 1976, the United States and Canada together accounted for about 77 percent of Japan's lumber imports. The concentration of lumber imports from these two sources probably reflects in part the log export restrictions in the two countries. Roundwood log exports from British Columbia are prohibited unless declared surplus to domestic needs. On the U.S. west coast, roundwood log exports are generally prohibited except for logs originating on State of Washington Department of Natural Resources lands or on private lands. For specific details on these regulations, see Lindell (1978). An exception to the restriction on log exports from National Forest lands in Alaska during the period 1969-76 was western redcedar and Alaska yellow cedar. These relatively minor species could then be exported without restriction. Western redcedar must now be offered to domestic cedar processors prior to export. Alternatively, these logs must receive primary processing according to restrictions applicable to the rest of the National Forest timber volume prior to export.

A share of lumber imports from the United States is in the form of so-called "waney" lumber. This lumber is processed to meet minimum requirements for logs originating on Federal lands--timber purchasers can process round logs into lumber with a maximum thickness of 8-3/4 inches. There are neither length nor width maximums. Typically, the lumber is processed on only two sides, leaving the "wane" on the edges of the lumber. Waney lumber is further processed in Japan. Alaska is the major source of waney lumber in the Japanese market. For

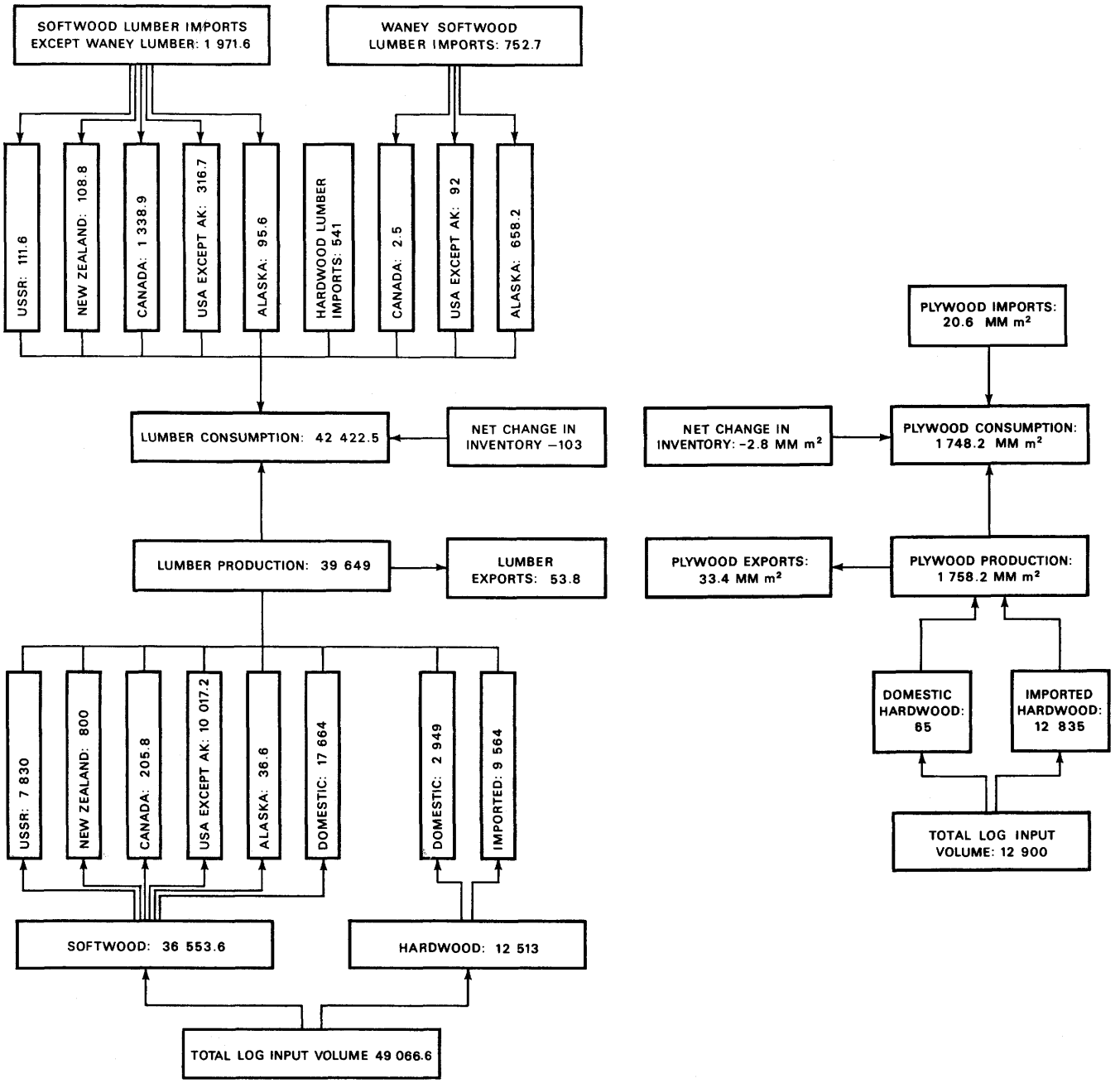

Figure 3.--Material flows in Japan's lumber and plywood industries (Volume in 1 000 m^3 except when noted. Based on data in Forestry Agency of Japan, 1977, and Japan Lumber Journal, Inc., 1977A).

example, Alaska accounted for 87 percent of the 1976 import volume of 752.8 million m^3. Waney lumber amounted to 87 percent of Alaska's shipments of lumber to Japan in 1976 (Japan Lumber Journal Inc. 1977A).

The potential impacts of a change in softwood log export policy in Alaska on prices in Japan depend on the responses of consumers and producers in Japan, timber sale purchasers in southeast Alaska, and producers of competing products in other supply sources. Since existing industry in southeast Alaska grew up with the existing log export restriction, there are no precedents to judge the reactions of producers and consumers in the marketing chain from standing timber to end use in Japan. Scenarios can, however, be constructed based on current timber flow patterns and based on assumptions about the reactions of producers and consumers.

POTENTIAL IMPACTS OF CHANGE

Demand Responses in Japan

The price impacts of any change in log supply from southeast Alaska would depend in part on the elasticity of demand for Alaskan logs and in part on interactions between the price of Alaskan logs and the prices of competing raw materials. Since logs are used as an input in the manufacture of lumber, the demand for logs is derived in part from the demand for the finished product.

There is little in the way of a data base to speculate about the elasticity of demand for lumber in Japan. If we extrapolate from the U.S. experience, the elasticity of demand is probably less than -0.5 and may be on the order of -0.1 or less in the short run (Adams et al. 1977). Reasons for expecting an inelastic demand in Japan as in the U.S. are strong consumer preferences for wood compared with other materials, familiarity of building tradesmen with wood as a construction material, and the relatively small portion of housing costs attributed to wood. Other costs, especially land in Japan, have risen faster than the cost of construction materials.

An inelastic demand for lumber contributes to the expectation of an inelastic demand for imported logs. An additional factor contributing to this expectation is that imported logs are processed near the port-of-entry. Existing distribution channels are not set up to make domestically produced log substitutes for imported logs. The profit motive provides the incentive for log importers to try to operate processing plants near capacity.

In evaluating the potential price impacts of softwood log imports from Alaska, it has been assumed that the elasticity of demand for imported logs is -0.1 at the observed price and quantity in 1976. For the purposes of illustration, impacts are also calculated for a demand elasticity of -0.5. Other assumptions, necessary because of a lack of data, include the following:

1. There are no linkages between the demand for imported softwood logs and softwood lumber imports, hardwood log and lumber imports, or domestic softwood and hardwood sources. At least conceptually, the prices of softwood lumber imports, domestic timber, and hardwood log and lumber imports act as shifters on the demand for imported softwood logs. The assumed lack of linkages among raw material sources abstracts from these interactions and probably lends a bias in the direction of high price impacts.

2. Japanese importers have no species preference for imported softwood logs. This assumption abstracts from the price premiums paid for Douglas-fir, western hemlock and other species. The assumed lack of consumer preference probably lends a bias towards lower price impacts than would actually be realized through a change in export policy.

Supply Responses

Because interactions of demand for imported softwood logs and other sources of timber are not considered in the analysis, the supplies of raw materials from imported softwood lumber sources, domestic sources, and imported hardwood sources are assumed to be unresponsive to changes in softwood log import prices. We still have to consider the price responsiveness of softwood log supplies from the U.S.S.R., New Zealand, Canada, the U.S. west coast, and Alaska.

Softwood log export volume from the U.S.S.R. is probably price inelastic. The need for foreign exchange is a driving force behind this country's export activities. Development plans in eastern Siberia are keyed on a population base dependent on natural resource management and extraction. For the purposes of this analysis, supply from the U.S.S.R. is assumed to be perfectly inelastic with respect to price at the price and quantity observed in 1976.

In New Zealand, the log export market provides an outlet for timber surplus to domestic needs. This would probably tend to make export volume price inelastic over the range of volume considered in this analysis. In addition, New Zealand is moving in the direction of promoting the export of finished products rather than logs (Ferguson and Parks 1976). This direction is an argument in favor of inelastic supply: existing log exporters would probably be motivated to continue log exports prior to the change in direction on trade policy. Softwood log export supply from New Zealand is assumed to be perfectly inelastic at the price and quantity observed in 1976.

British Columbia, the Canadian source of logs in the Japanese market, has a long-standing log export restriction (Lindell 1977). Log exports under this restriction are probably more responsive to market conditions in British Columbia than in the Japanese log market: logs must be declared surplus to domestic needs prior to being eligible for the export market. For the purposes of this analysis, Canadian log exports are considered to be perfectly inelastic at the observed price and quantity in 1976.

Since most of the log exports from Washington, Oregon, and California are from private lands, the profit motivation for log owners tends to make export volume responsive to changes in prices. Even for this source of logs, however, there are arguments in favor of an inelastic supply. Logs are typically exported according to the terms of multiyear contracts which feature annual openings for negotiations on both contracted volume and price. A further argument for an inelastic supply over the range of volumes considered in this analysis is that logs from private lands may be of a species not needed in the owner's operations or may be volume surplus to the owner's needs. Additionally, the export market pays a premium for needed logs. Even if log prices were lowered somewhat, there would still be an incentive to sell these logs in the export rather than the domestic market. For the purposes of this analysis, it has been assumed that the elasticity of supply for logs coming from Washington, Oregon, and California is equal to 0.5 at the observed price and volume in 1976.

The elasticity of supply for additional log volumes from Alaska is assumed to be 0.5. There is little precedent to judge the price responsiveness of this supply, however. Higher prices would make more timber accessible; but the timber appraisal process used by the U.S. Forest Service would capture a share of high revenues, reducing the incentive to export logs.

The structure of demand and supply which has been postulated for softwood logs imported into Japan probably results in an estimate of the maximum price impacts which could be associated with expanded log exports from the Tongass National Forest. Despite this shortcoming, the analysis is useful for policy analysis in that it places an upper limit on price impacts to be associated with a change in policy.

The Conceptual Model

The conceptual model used to illustrate the potential price impacts of a shift in Alaskan log supply is shown in figure 4. The price and volume data used in the illustration are for 1976. Supplies from the U.S.S.R., New Zealand, and Canada are assumed to be perfectly inelastic with respect to price at the recorded volumes for 1976. Supplies from the west coast states of Washington, Oregon, and California, and Alaska are assumed to have an elasticity of 0.5 at the observed price and quantity for 1976. All imported logs are assumed to be homogeneous with no distinctions for species and log grades.

Linear supply schedules are assumed and calculated as:

$$\frac{q_i}{p} e_i = \frac{\Delta q_i}{\Delta p}$$

$$q_i = A + \frac{\Delta q_i}{\Delta p} (p) \quad ;$$

where

e_i = elasticity of supply for logs from source i,
q_i = quantity of imports from source i in 1976, and
p = average price of imported logs from all sources in 1976.

The demand schedule in figure 4 is based on an assumed elasticity of -0.1 at the observed price and quantity for all imported softwood log volume in 1976. The schedule is assumed linear and calculated as:

$$\frac{q}{p} \quad e = \frac{\Delta q}{\Delta p}$$

$$q = A + \frac{\Delta q}{\Delta p} (p) \quad ;$$

where

q = imported softwood log volume in 1976,
p = average price of imported softwood log volume in 1976, and
e = elasticity of demand.

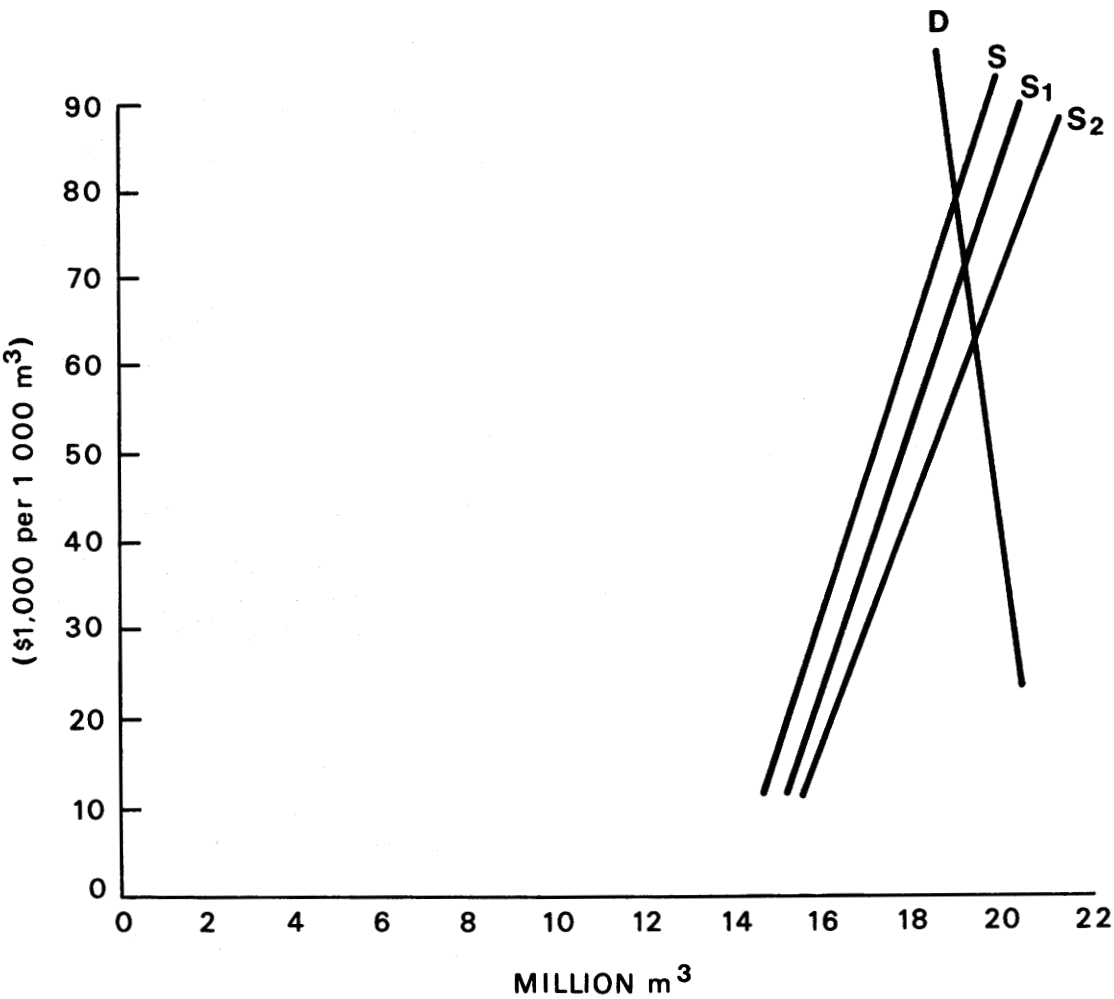

Figure 4.--Demand for imported softwood logs in Japan and supply of imported softwood logs under alternative export policies on the Tongass National Forest (demand represented by "D" in figure. "S" is total softwood supply under current export policy on the Tongass National Forest).

The analysis was also carried through with an assumed elasticity of -0.5.

Two possible supply shifts from Alaska at the observed price and quantity in 1976 were postulated: 679 500 m^3 and 1 585 500 m^3 (S_1 and S_2 respectively in figure 4). The supply elasticity for Alaskan exports after each supply shift is assumed to be 0.5. Supply schedules are assumed linear and calculated as above.

The supply shift of 679 500 m^3 is based on a change in policy to partially ease the current export restriction. Existing industry in southeast Alaska claims to need about 2 944 500 m^3 of timber to maintain existing operations. Since the allowable annual cut is 3 624 000 m^3, this leaves 679 500 m^3 which can be viewed as being surplus to domestic needs. Under the terms of this policy change, the Tongass National Forest would in effect have a 679 500 m^3 export quota.

The assumed supply shift of 1 585 500 m^3 is based on a complete removal of the log export restriction on the Tongass National Forest. The Japanese log importers generally prefer No. 2 and better saw logs--average quality and better (Darr 1975). About 1 585 500 m^3 of the 3 624 000 m^3 allowable annual cut meets this quality criterion.[1/] In the analysis, Alaskan producers are assumed to be willing and able to sell the additional 1 585 500 m^3 at the price observed in Japan in 1976.

For both supply shifts, the analysis assumes that the two export levels are feasible from the standpoint of the Alaskan timber market. Possible impacts on this market are discussed later. The analysis also abstracts from possible problems related to the availability of factors of production such as logging crews and shipping capacity.

Price Impacts in Japan

An increase in supply of 679 500 m^3 of softwood logs from Alaska would reduce the price in Japan from $78,150 per thousand m^3 to $70,833 if the elasticity of demand is assumed to be -0.1 and to $74,565 if the elasticity of demand is assumed to be -0.5; this amounts to percentage declines of 9.4 and 4.6, respectively. For a supply increase of 1 585 500 m^3, the percentage decline in price is 20.6 percent if the elasticity of demand is -0.1 and 10.4 percent if the elasticity of demand is -0.5.

The price declines would range from $3,585 to $16,066 per thousand m^3 depending on the elasticity of demand (e_D) and the amount of the supply shift:

Supply shift and e_D	Dollars per 1 000 m^3
679 500 m^3	
e_D = -0.1	7,317
e_D = -0.5	3,585
1 585 500 m^3	
e_D = -0.1	16,066
e_D = -0.5	8,115

At the lower prices, the increase in supply is less than the assumed increment in Alaskan exports at the 1976 price. The supply offsets occur from Alaska and the other west coast States:

[1]Source: USDA Forest Service, Region 10, Juneau, Alaska.

Supply increase and e_D	Supply offset due to lower price ($1\ 000\ m^3$)	
	Alaska	Washington, Oregon, and California
$679\ 500\ m^3$		
$e_D = -0.1$	33.7	468.8
$e_D = -0.5$	16.8	229.6
$1\ 585\ 500\ m^3$		
$e_D = -0.1$	167.1	1 029.6
$e_D = -0.5$	84.4	520

Impacts in Alaskan Timber Market

If all of the price decline in Japan is passed along to the stumpage market in southeast Alaska, timber appraisals for U.S. Forest Service sales would be as follows:[2/]

Assumed end product:	Stumpage price (dollars per $1\ 000\ m^3$)
Log exports:	
Current policy	26,472.46
Supply increase of $679\ 500\ m^3$	
$e_D = -0.1$	20,033.15
$e_D = -0.5$	23,317.93
Supply increase of $1\ 585\ 500\ m^3$	
$e_D = -0.1$	12,333.36
$e_D = -0.5$	19,331.17
Cants and chips	22,847.73
Pulp	5,033.12

The derived stumpage price for log exports without taking into account market responses ($26,274.46) is higher than either the residual price for cants and chips appraised to the Japanese market or the value of stumpage appraised to the pulp market. After accounting for market responses, only the stumpage value resulting from a $679\ 500\ m^3$ increase in supply with a demand elasticity of -0.5 exceeds the value of stumpage currently appraised to the Japanese cant and chip market.

[2]Darr, David, et al. 1977. An Overview of Some Economic Options for Southeast Alaska. 219 p., illus (Unpublished).

In the above analysis, the assumption has been made that with a 679 500 m^3 quota for the log export market, the existing cantmills and pulpmills could continue operations as is. This assumption ignores the realities of timber quality differentials. If we assume that the distribution of log grades in the timber inventory is equal to the distribution of log grades in an allowable annual cut level of 3 624 000 m^3, the distribution by log grade would be as follows:

Log grade	Percent of volume	m^3
Select and peeler	1.9	68 856
No. 1	8.1	293 544
No. 2	33.0	1 195 920
No. 3	52.9	1 917 096
Cull	4.1	148 584
Total	100.00	3 624 000

Total volume classed as select and peeler, No. 1 and No. 2 equals 1 558 320 m^3. The active cant producers in southeast Alaska have a capacity of about 1 608 150 m^3. Actual consumption in 1974 equaled 1 336 250 m^3. These cantmills consume primarily No. 2 and better saw logs: in 1975, 87.5 percent of the volume was of this quality.[3]

If the cantmills operating at capacity require a log mix of 87.5-percent No. 2 and better quality, these mills need 1 408 800 m^3 to maintain capacity operation. Less than 1 408 800 m^3 of No. 2 and better saw log volume would be left to the cantmills under each of the export supply responses portrayed in this analysis:

Supply increase and e_D	Volume exported	Volume remaining for cantmills
	1 000 m^3	
679 500 m^3		
e_D = -0.1	682.4	875.9
e_D = -0.5	699.6	858.7
1 585 500 m^3		
e_D = -0.1	1 455	103.3
e_D = -0.5	1 537.7	20.6

The cantmill industry might adjust to a lower quality log mix. Alternatively, some cantmill capacity might be closed down under either a partial or complete easing of the export restriction.

A further reason for expecting cantmill closure even under a partial easing of the export restriction is that waney lumber or cants are processed to meet the terms of the current export restriction. If 679 500 m^3 of No. 2 and better saw logs could be exported, Japanese purchasers may substitute logs for cants. In 1976, the volume of waney lumber exports from Alaska to Japan equaled 915 100 m^3,

[3]Source: USDA Forest Service, Region 10, Juneau, Alaska.

log equivalent. If logs were substituted on a one-to-one basis, only 235 600 m^3 need be taken in the form of waney cants. A volume of 235 600 m^3 is equivalent to the annual log input of one of the larger cantmills now in operation.

The volume of No. 2 and better saw logs remaining for the cantmills after a supply increase of 1 585 500 m^3 is not adequate to support a cantmill if the elasticity of demand is -0.5. A volume of 103 000 m^3 is only marginal as a source of raw material for a cantmill.

Full use of an annual allowable cut of 3 624 000 m^3 either under the terms of an export quota of 679 500 m^3 or a complete lifting of the export restriction would require utilization of No. 3 grade saw logs and cull logs as well as high quality material. The two pulpmills have a capacity totaling 1 585 500 m^3 of log input. The combined cut for No. 3 saw logs and cull material for an annual allowable cut of 3 624 000 m^3 equals 2 065 680 m^3. Historically, the two pulp operations have been the only market for this low quality material. The excess volume of 480 180 m^3 might be used through development of a chip export market, through adjustment of cantmills to a lower quality log mix, or through expansion of the pulpmills. Because of the need to meet utilization standards, the excess volume of lower quality material might prohibit the sale of timber if the prospective purchaser could not find an outlet.

In either a partial or complete lifting of the export restriction, one or both of the pulpmills are the likely purchasers of the export sales. The established positions of these mills in the timber market of southeast Alaska and the end product market of Japan coupled with the timber supply stability inherent in the long-term sales give them formidable advantages in bidding against outsiders. Each of the pulp operations as purchaser of timber sales eligible for the export market would be in a position to judge the relative profitability of routing logs to the export market, to the cantmills, or to the pulpmill.

Assuming that the two pulp operations purchased any sales made available to the log export market, there are two primary reasons for expecting them to continue operation of the pulpmills. First, the timber sale purchaser would need an outlet for the low quality material. Currently and historically, this outlet has been the two pulpmills. Second, the high-fixed costs of pulpmill manufacture act as incentives for keeping the pulpmills in operation. Depending on the accounting procedure, fixed costs of pulp manufacture may amount to as much as 50 percent of total costs. These costs would continue even if the pulpmills were shut down. If "rational," the owner of an operating pulpmill would tend to look upon recovery of fixed costs as profits.

IMPLICATIONS OF ANALYSIS OF IMPACTS

Stumpage Revenues

The log export market offers potential for increasing stumpage revenues. This potential, however, is constrained by the possible reduction in prices caused by an expansion of supply in the log export market. The results of this study indicate that an expansion of supply by 679 500 m^3 would reduce potential stumpage revenues to about the level realized if timber is appraised at the present volume level to the cant and chip market in Japan. An expansion of supply by 1 585 500 m^3 would reduce potential stumpage revenues well below the potential from the cant and chip market. Even for the larger supply increase, however, stumpage revenues from the log export market would exceed revenues from sales to pulp as the end use.

Industry Stability

If the Japanese followed current practice and took primarily No. 2 and better saw logs after an easing of the export restriction, the existing cant industry in southeast Alaska would have to curtail operations or adjust to a lower quality log mix. Adjustment by the cantmill industry would be necessary even under the terms of 679 500 m^3 export quota which seemingly protects the stability of existing industry. The necessary adjustments would be accentuated by a complete easing of the restriction.

Relation to Previous Work

Swenson (1971), and the Public Land Law Review Commission (1969) both recommended easing the export restriction to the extent of logs surplus to the needs of existing industry. This recommendation was based in part on the expectation of higher stumpage revenues and in part on the presumed stability of existing industry. Neither study considered the details of possible market responses in the timber market of southeast Alaska and the end product market of Japan. Missing were considerations of timber quality relative to end use and of the elasticities of demand and supply in Japan.

The methodology used to specify the model of Japanese forest products market is a crude analytical tool in many respects. A general equilibrium econometrics model is perhaps a better approach from a conceptual standpoint. In U.S. literature, McKillop's (1973) work remains the only attempt at this approach. Although a model could be postulated to simulate demand and supply interactions, trade flows are influenced by a variety of factors such as tariff and nontariff trade barriers and changes in domestic policies unrelated to the prices or quantities of wood flows. Aside from the conceptual problems of modeling these nonmarket forces, there are formidable data problems in estimating the flow of an intermediate product, roundwood, among producers and consumers. The data problem for specifying a model of Alaskan log exports is confounded by a lack of precedent by which to judge the reactions of producers and consumers.

Export Policy

An easing of the export restriction provides an additional outlet for the higher quality portion of the Alaskan timber resource. The advantage of logs over cants in terms of stumpage revenues decreases as log export volume increases. The trade-off associated with the potential of higher stumpage revenues from the log export market is the potential for disruption of the stability of existing industry--especially cantmill operations. An expansion of the use of higher quality material carries with it the need to utilize coincidental lower quality timber. In considering any change in export policy, the Forest Service in southeast Alaska has the problem of weighing this trade-off with other objectives which determine the mix of the agency's responses to competing demands.

From a national perspective, the potential for increased stumpage revenues in southeast Alaska might be realized at the expense of decreased log export revenues in Washington, Oregon, and California--price reductions in the Japanese market feed back to all log supply areas. In 1976, the value of log exports to Japan from the three west coast States totaled $764.5 million (Ruderman 1977). Price declines associated with the supply increases protrayed in this analysis ranged from 4.6 to 20.6 percent. These declines correspond with a range in

potential revenue reduction of $32.2 million to $157.5 million for exporters in Washington, Oregon, and California. The distributional aspects of revenue gains and losses might be a deciding factor in any change in export policy in southeast Alaska.

The status of National Forest land in southeast Alaska is confused by the possible extent of land transfers to the State of Alaska and to Native corporations. Undoubtedly, some land and timber will be transferred from the Federal Government to local organizations. This will reduce the allowable annual cut on the Tongass National Forest and add a constraint on the flexibility of the U.S. Forest Service to change the export policy to fulfill the agency's goals and objectives. Future timber management policies on lands selected by Native corporations are not clear. The export of roundwood logs is one option being considered. Maximization of stumpage revenues is one possible objective of timber management on these lands. The potential price impacts of increased log export supplies discussed in this paper for National Forest lands applies as well to increased supplies from Native lands.

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GPO 986-366