TIMBER UTILIZATION TRENDS AND OPPORTUNITIES FOR TRIBAL TIMBER

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I appreciate the invitation of the Intertribal Timber Council to speak at the National Indian Timber Symposium. In return, let me extend to you an open invitation from our Director, John Erickson, to visit the Forest Products Laboratory in Madison, Wisconsin. The Forest Products Lab (FPL) has been doing forest product utilization research for over 75 years. There are nearly 100 research scientists at FPL, along with an administrative and support staff of over 200, so altogether we have about 300 people at the laboratory. Our research ranges from wood protection, wood decay, and basic engineering properties of wood, to research on engineered wood structures, pulping, papermaking, national timber markets, and new uses for wood in biotechnology. We have tours scheduled each week and can make special tour arrangements for groups or individuals. We will be happy to make special tours for your convenience. You may also want to contact individual experts at FPL on technical questions related to wood science and wood use. If you want to schedule a tour, as an individual or part of a group, please contact our Host Coordinator (phone 608-264-5640).

My research is in the area of national timber market research and economics. Our economics research at the Lab involves studying national trends in wood product demand and projecting how those trends will affect demand for timber from U.S. forests, both public and private. Many of our economic projections will appear in the upcoming Forest Service Timber Analysis report. The Timber Analysis report is scheduled to be published later this year. A preliminary draft of the report has been released for public review (Haynes 1989). Projections that I discuss are based primarily on the draft version of the Timber Analysis report, so they should be regarded as only preliminary study results at this stage. Many of the projections I am going to talk about are preliminary projections, they are not final study results, but I think they will help to give you an idea where we think the trends are going in timber markets in the future. Also at the end of my talk I am going to get further into some specific market opportunities, ways of perhaps developing market niches outside of the, broader commodity product area.

One purpose of this report is to present some current views on changing wood product technology and likely effects on regional markets for timber. I will highlight some important trends that we see taking

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place in the forest product sector. My objective is to convey a sense of awareness about certain trends that may be helpful in planning timber management or market strategies on tribal timber lands.

However, I must emphasize that I cannot tell you what the best silvicultural strategy or market strategy will be for you, because the tribal timber situation and timber markets vary from one location to another. You must plan at the local level to determine your own tribal timber goals and what is the best strategy in your local area.

I will also discuss some market opportunities or ideas for wood products that might be developed as a small business or tribal enterprise. These include fabricating wood trusses for construction, manufacturing wooden parts for windows, doors, or cabinets; flooring stock, or other "cut stock" products; and the general idea of making cut stock or specialty lumber grades tailored to Japanese, East Asian, or European markets. These are just examples of ideas that could provide new market niches or add value to the use of tribal timber with a fairly modest capital investment.

General Overview

I will begin with a quick overview of timber utilization and wood product production in the United States. In 1986, the most recent year for which we have compiled all of the national data, we estimated that forests in this country produced a total of about 18 billion cubic feet of roundwood timber. That's about 75 cubic feet of wood per year for each man, woman, and child in the United States. Where does all this wood go in the economy?

If we look at the 18 billion cubic feet or 75 cubic feet of roundwood per capita, we find that about 41 per cent goes directly to sawmills, 25 per cent to pulp mills, 17 per cent into fuelwood, 9 per cent into veneer and plywood mills, and 4 per cent into particleboard mills and miscellaneous Industries, while 3 per cent is exported as roundwood or chips. (Fig. 1, See page 312.) However, once the roundwood gets to the mills a lot of by-products are produced, such as sawmill chips, slabs, and veneer cores, and these mill residues usually wind up in pulp mills, particleboard plants, or fuelwood. So, in the final analysis about 40 per cent of all the wood winds up in the pulp and paper sector, 25 per cent in fuelwood, 25 per cent in lumber, plywood, and particleboards, and 10 per cent in other products and end uses (Fig. 2). I want to emphasize that this situation describes where we are today. However, things are gradually changing so that in the years or decades ahead we will find a different range of product and market opportunities for timber developing in the future. As technology changes, and as the wood resource evolves over time, we expect that

the industry structure and location will change, resulting in new and different timber market opportunities. Let's begin by taking a look at structural panel products for example.

The Structural Panel Sector

The structural wood panel products are the familiar softwood plywood and the newer waferboard and oriented strandboard (OSB) products. These are mostly 4 by 8 foot panels, and they are used mostly in construction where structural strength is needed for sheathing, flooring, or roof decking. (Structural panels do not include other particleboards, hardboards, or insulation boards that do not provide the same structural properties.)

Just a short time ago (about 25 years ago) the only structural wood panel product that was made in the United States was softwood plywood and it was made primarily from Douglas-Fir in the Pacific Northwest from about 1905. Then, in the late 1950s and early 1960s, a lot of research and development was done on small-log plywood processes and improved adhesive systems. This development resulted in the ability to make plywood efficiently out of southern pine species. As late as 1964, just after the first commercial southern pine plywood mill opened, almost all U.S. plywood production was still located in the West (Fig. 3). However, by 1979 a big share of the structural panel plywood production was located in the South (Fig. 4). Dozens of Southern Pine plywood mills had developed and virtually all net growth in plywood production of the 1960s and 1970s was in the South, not the West. This major geographic shift of the plywood industry shows how a changing technology can shift the pattern of wood use and influence timber management strategies in different regions. The idea of managing southern pine timber to produce veneer logs for plywood thus became an important part of southern timber management strategies in the 60s and 70s.

Development of OSB and Waferboard

A trend of the last decade that may become even more significant is the development of waferboard and OSB. These are newer structural panel products that can be used in many ways like softwood plywood for structural purposes, but they can be made from a completely different kind of wood resource. The thin wood wafers and wood strands that go into OSB and waferboard are made mostly from low-density hardwood species, like Aspen or Yellow Poplar. These are species that are found in the eastern forests as well as the northern and southern hardwood forests. The OSB/waferboard technology can use other species also, including softwoods, but the really dramatic change is the ability to make good structural wood panels out of low-value hardwood species, which was not previously possible before with plywood technology.

The modern OSB/waferboard industry started out in the United States in the 1970s, with just one mill located in the North as late as 1979 (Fig. 5). By 1989, 26 OSB mills were located around the country, mainly in areas of the North and South where low-value hardwood pulpwood type raw materials are utilized. Again mostly Yellow Poplar in the South and Aspen or Poplar in the North. Some of the mills in the South are using Southern Pine. (Fig. 6).

During the 1980s, OSB/waferboard technology took over a sizable share of the structural wood panel market (Fig. 7). The preliminary projections from the draft Timber Analysis report (not final results) suggest that the OSB/waferboard industry will continue to grow beyond the year 2000. Our preliminary projections for the year 2010, for example, show that most of the net growth in structural panel production will be in the OSB/waferboard technology (Fig. 8). Softwood plywood production is expected to level off and actually decline somewhat in the years ahead. The South and North will become major producers of OSB/waferboard. Some OSB/waferboard will also be produced in the West.

Note that the softwood plywood industry is not expected to disappear or be replaced by OSB/waferboard. We expect that plywood will remain a dominant but declining part of the structural panel industry in the decades ahead. However, changes are taking place in plywood technology. Some of these changes are a response to the competitive challenge of new and efficient OSB/waferboard mills. New technologies for peeling small logs, new gluing techniques, and improved veneer drying will be adopted by plywood mills to make them more efficient and more competitive with low-cost OSB/waferboard mills. As a consequence of these improvements in plywood processing, plywood mills will also develop the ability to use smaller diameter and lower quality timber. If you want more detail on these developments, I suggest that you contact Henry Spelter of our research project in Madison, who has just completed a study of likely developments in plywood technology and their effect on timber requirements (Spelter 1988).

The "Leveling Principle"

At this point it is appropriate to digress and discuss possible implications for timber markets of the future. I think we have to infer that the development of OSB/waferboard and changes in plywood technology will result in an increasing ability for the industry to use small logs and low-quality hardwoods in place of higher quality softwood peeler logs. The OSB/waferboard mills use timber that is similar to pulpwood in size and quality. Modern plywood mills are able to use small diameter timber also. As managers of tribal timber resources, you may want to consider what will be the effect of this

development on the price premium that timber buyers are willing to pay for higher grade sawlogs and veneer logs in the future.

Historically, wood in a high quality sawlog or veneer log was always worth more per cubic foot or per board foot than pulpwood or smaller, lower quality logs. This will continue to be true in the future for some time to come. However, if a plywood mill of the future can use small logs, and if OSB/waferboard mills can use pulpwood-type raw material, then it stands to reason that the need for higher quality softwood timber will gradually decline. In essence, manufacturers of mass commodity wood products are simply trying to use cheaper wood raw material to reduce costs. As they succeed in doing so, they will also reduce the need and demand for larger diameter or traditionally higher quality timber. Given certain assumptions about timber supply, a reduced need for larger diameter timber could tend to level the market premium that is paid for higher quality timber. This is what I have called the "leveling principle" of commercial and technological development in timber markets (Ince 1986). In fact, over the past decade we have already seen some anecdotal evidence for a decline in the premiums paid for higher grade softwood timber in the South and West (Figs. 9 and 10).

We also know that the average commercial diameter for some timber species is declining in some areas, such as in the West where the average diameter of softwood timber is declining. In other words, at the same time that technological change is reducing the technological need for larger diameter or high quality timber, the supply of such timber is declining. We have not analyzed future softwood timber supply and demand from the standpoint of different size classes or grades. Both the supply and the need for high quality softwood timber appear to be declining, but the question of which will decline more rapidly is really a "toss up". Also, the supply and demand situation will vary from one location to another. In one area, if old plywood mills continue to operate or new market opportunities are developed for large diameter softwood logs, and if the supply of such timber declines, then the premium for the higher quality timber could go up. In another area if the market is shifting to smaller logs and the need for larger diameter timber is not urgent, then the premium for higher quality timber could decline. I am not suggesting that we can predict the future, I am simply saying that you need to be cautious about assuming that high quality or large diameter softwood timber will continue to command a high price premium in the mass commodity timber markets of the future.

Lumber Markets and Sawmill Sector

Lumber markets and lumber manufacturing technology represent another broad area that reflects the leveling principle of commercial

development in timber markets. In the last 25 years of so, the housing and wood construction industry has shifted over to a 2-by-4 or 2-by-6 technology. The bulk of the mass construction market has shifted away from the use of wide dimension lumber like the traditional 2-by-12 inch joists and wide dimension boards. Consumers and the construction industry have opted for lower costs and greater efficiency. The structural wood panels that I discussed previously have virtually replaced wide dimension boards as sheathing material in wood construction because wood panels are cheaper and easier to install.

Builders now typically use floor trusses and roof trusses made from 2-by-4 inch dimension lumber on the majority of construction sites. There are still a market and a price premium for some larger dimension softwood lumber and boards, but increasingly we are moving toward a mass commodity market dominated by 2-by-4 or 2-by-6 softwood lumber. We know, of course, that smaller dimension lumber can be sawn from smaller and lower value sawtimber than required for larger dimension lumber.

In addition, sawmilling technology has evolved to use small diameter logs quite efficiently. Small log sawmills have appeared and will continue to be installed all over the country. Our preliminary projections for the draft Timber Analysis report show substantial declines in average diameter of softwood sawtimber, particularly in the West (Fig. 11). Despite the declining average log diameter, the average lumber recovery factor is expected to increase in the decades ahead (Fig. 12). This is good news for sellers of small diameter timber, but again it may mean less future need for larger diameter or higher quality timber. In general, prices for softwood sawtimber may be projected to rise in the future (preliminary projections of softwood sawtimber prices are shown in Fig. 13), and demand may go up or down in response to economic cycles. However, there will probably be less of a priority in the need for larger diameter or "old-growth" softwood timber, at least in manufacturing mass commodity products such as construction lumber and wood panels. To be more precise, softwood sawmills may continue to use larger diameter timber, but there will be less need to pay a high premium for that timber if they can use smaller diameter timber instead. Exceptions to this principle will occur in the case of high quality softwood timber for export or for specialty products that would require the special appearance characteristics of wood from old-growth or large diameter timber. Examples could include certain wood paneling markets in Europe and softwood product markets in Japan where there is a strong preference for fine-grained clear wood from old-growth softwood timber because customers highly value the appearance of such wood.

In the case of hardwood sawtimber and hardwood veneer-quality timber, higher premiums for higher quality hardwood logs will probably continue, and the demand for export of such logs will increase. Preliminary studies that were done for the Timber Analysis suggest that the prices paid for higher quality or larger diameter hardwood sawtimber in the future will generally increase more than the prices for lower quality hardwood sawtimber. Higher quality hardwood will continue to be used in applications where the appearance quality of the wood makes a big difference in value, such as in furniture, cabinets, and hardwood veneer. In these kinds of applications, consumer preferences for traditional wood quality and appearance may support increasing demand for the older and larger diameter hardwood timber.

Fuelwood

Another important trend is the use of wood for fuel. The preliminary projections in the draft Timber Analysis show a generally increasing use of wood for fuel. This includes roundwood fuelwood (like residential fuelwood) and industrial fuelwood in the form of whole-tree chips, mill residues, or pulping liquors (Fig. 14). Note that fuelwood is generally a low value product, although it can be a way to use low value timber that otherwise would have no market value. Even trees like the mesquite can be used to produce revenue as fuelwood or charcoal. However, in general, demand for fuelwood and the price of fuelwood will vary depending on the price of other energy sources. Since we have fairly abundant resources of coal in this country, fuelwood prices are not likely to rise substantially unless there is much more demand for residential fuelwood, charcoal, or other specialty products. A big increase in demand for fuelwood took place in the 1970s along with the so-called energy crisis, but use of residential fuelwood has begun to be limited in some areas because of concerns about smoke pollution from wood stoves. If you want more information about national or regional demand for fuelwood or likely changes in sawmilling technology, I suggest that you contact Ken Skog of our research group at the Forest Products Lab. He has been studying developments in these sectors.

Pulp and Paper

The last major timber market area that I will discuss briefly is pulpwood. As I mentioned earlier, the pulp and paper sector is the largest single commercial user of wood in the U.S. economy. It is also a sector that is projected to grow substantially in the future, with increasing demand for pulpwood. Like other product sectors, important changes are taking place in the pulp and paper sector. I have been involved in a detailed study of likely technological developments in this sector, investigating the likely impact of such developments on

pulpwood requirements. Again, all I have to share with you at this time are preliminary results from the draft Timber Analysis (not final results). Nevertheless, the preliminary results should give us a reasonable sense of the direction of pulpwood demand in the future.

First, we are projecting that production of paper and paperboard will increase in all regions, with total production probably more than doubling in the next 50 years or so (Fig. 15). Production of paper and paperboard has already doubled in the last 30 years, so this projection is in line with historical trends. One of the significant things that will occur in the decades ahead is increased use of wastepaper or recycled fiber (Fig. 16). Our analysis shows that although the utilization rate for wastepaper has declined and leveled off in recent decades, it will go up in the decades ahead. This is because stronger environmental incentives will be used to reduce the problem of waste disposal in our economy, and more importantly, because the pulp and paper industry is likely to develop and apply technology to utilize more wastepaper. As a result of the increased use of wastepaper, we project that wood pulp production will not grow as rapidly as paper and paperboard production, as recycled fiber is substituted for wood pulp (Fig. 17). Also, technological changes, such as increased use of high-yield mechanical pulp, will reduce the amount of pulpwood needed to produce a ton of pulp (Fig. 17). As a consequence, pulpwood consumption is projected to increase, but not nearly as rapidly as the projected increase in production of paper and paperboard (Fig. 18). While paper and paperboard production is projected to double in the next 50 years, a corresponding projection of pulpwood consumption shows an increase of less than 40 per cent. Hardwood fibers are generally much shorter and less flexible. They are stiffer and provide less strength than softwood. Furthermore, we anticipate that the fraction of pulpwood that is hardwood will increase substantially to about 40 per cent of all pulpwood (Fig. 18).

Once again, we see an example of the leveling principle. The need for the higher value softwood pulpwood will increase overall, but it will decline in proportion to the need for lower value hardwood pulpwood. Logically, if the balance of hardwood and softwood pulpwood supply does not change substantially, we would expect that hardwood and softwood pulpwood prices would come closer together in the decades ahead. Again, this is all in general terms, and we must look closely at the local market situation because the timber market situation can vary greatly from one location to another.

Summary of National Trends

In the previous sections I have made a number of points about regional and national trends in timber markets. First, as illustrated by this

trend in the development of OSB/waferboard, we are likely to see continuing evolution of technology and changing wood resources around the country, which means that timber markets will gradually change in the decades ahead, despite the ordinary “ups and downs” of the business cycle. This is a pretty interesting trend, this is the growth in pulpwood of OSB/waferboard. This is historical data, it is not a projection.

Second, if current trends are any indication of the future, we are likely to see technology changing in such a way that greater use will be made of lower quality or lower value timber (more use of small diameter softwood timber and low value hardwoods). This may be good, it may create better markets for small timber sellers, but in broad and general terms, this will tend to level the premium that mills pay for higher quality softwood timber in the mass commodity markets.

On the other hand, a rapidly declining supply of high quality softwood timber in some localities could offset the leveling effect of c hanging technology, particularly if the supply is declining more rapidly than the need for high quality softwood timber. (We have no complete analysis of the general situation at this time.)

Third, opportunities will exist to obtain a high premium for some kinds of high quality timber, both hardwoods and softwoods, if there is increasing demand for products that make use of the unique appearance characteristics of wood from “old-growth” or high quality timber. This could be true in particular of high value hardwood used in furniture, cabinets, or flooring, for example, or high value softwood logs or specialty softwood products for export to Europe and Asia, if such markets are developed.

Finally, the most important point is that you must think about these issues in terms of how they relate to your particular local situation. National and regional market trends are important, but the timber market situation and proper strategies can be understood only at the local level. ‘No single market strategy will work for everyone. The idea of developing a market strategy is to branch out and follow a path that is suited to your own local goals. National and regional studies are very useful, but each tribe should work up its own local market strategy depending on its own local situation.

Market -Opportunities

This is a good time to mention names of specialists who are available in the BIA to help in the process of defining your own tribal goals and market strategy in the timber or wood product area. At the Central Office (BIA in Washington, D.C.), the specialist is John Carlson; at

the regional level, Jay West, who is stationed in Minneapolis; and in Portland, Oregon, Gary Sims.

I understand that these specialists will be joined in the future by two other regional utilization and marketing specialists, including one who will be located in Phoenix. As John Carlson has communicated to me, these people are available to provide assistance in matching your timber resource with the market opportunities. I think this means sitting down with tribal members and helping to explore goals and opportunities on a local basis.

If my understanding is correct, many of you have already been looking at regional market opportunities through studies sponsored by the Intertribal Timber Council, and many of you have been working with the BIA utilization specialists and other consultants. I should also mention that the U.S. Forest Service has a number of timber utilization specialists, as some of you know, and you may also want to contact these people for advice. However, I think the best advice is to look at the regional and national market information, and then sit down at the local level to re-do a local market study tailored to your own tribal goals and local timber situation. In that regard, you may want to contact people like John Carlson, Gary Sims, and Jay West for help in obtaining the market information and matching your local resource with the market.

Finally, I will briefly discuss some specific market opportunities in wood products that you may want to consider. I know that many of you have already considered such opportunities, and I am hopeful that this presentation will lead to further discussion about the advantages and disadvantages of various market opportunities. Again, you have to look at opportunities from the standpoint of your own local situation, comparing notes with the experiences of others, but thinking about developing your own local strategy. No one, particularly not I, can tell you what your best strategy will be. You will have to work that our for yourself based on your own goals and your own local situation.

Truss Fabricating

The first opportunity that I will discuss in the fabrication of wood trusses for light frame construction. The truss fabricating industry is a relatively new wood product industry, having grown up in the 1960s and 1970s along with increasing use of prefabricated wood trusses in light frame construction. Light frame wood construction is now based predominantly on wood trusses, typically metal-plate connected roof trusses or floor trusses made from 2-by-4-inch softwood dimension lumber. There are many different designs in light frame wood trusses. Typically, fabricators use computer programs to obtain the right

designs for trusses to meet customer needs and to ensure adequate structural performance. An important element of modern truss fabricating is the use of precisely engineered designs and selected grades of lumber to provide necessary strength requirements. Generally, high grade softwood lumber is needed in the top and bottom "chords" (top and bottom spans) of trusses. Various manufacturers of the metal connector plates can provide information and access to the computer programs that are used in designing trusses to meet customer needs.

The Forest Products Laboratory made an extensive series of studies of the technology and engineering practices of the truss fabricating industry back in the 1970s (Kallio and Galligan 1978). These studies contain the most recent national survey data available on the truss fabricating industry. We found that truss fabricators are typically small businesses that use softwood lumber to produce roof and floor trusses for light frame construction.

Our survey of truss fabricators was based on an estimate that there were 1,700 truss fabricators in the United States. The survey found that the average replacement value of facilities among truss fabricators was less than $150,000. This suggests that you could enter the truss fabricating business with a fairly small capital investment. An average firm in the 1970s produced about 17,000 trusses per year, mostly roof trusses. Since the 1970s, floor trusses have become increasingly popular, so truss fabricators probably produce a somewhat larger share of floor trusses today. Average market value of output was on the order of $500,000 in the 1970s, but revenues varied with the demand for housing and new construction activity.

This leads to some market factors that you will need to consider if you are thinking about going into the truss fabricating business. First, the furniture parts, window and door components, cabinet parts, floor stock, and furniture stock. In general, we are looking at making an intermediate' product that has higher value than rough or finished lumber, but not a final product.

On the basis of this general description, a number of market considerations can be discussed. First, the business of making an intermediate product can result in a more stable market situation than making a finished product. The customer will be someone who takes what you produce and makes and sells the finished product (which could be finished furniture, doors, windows, or so forth). In that arrangement you avoid difficulties of dealing with consumer customers. However, to establish a market, you will have to go out and locate wood product manufacturers who are willing to buy the cut stock or rough mill products that you can make.

Second, an advantage in this kind of business is that you can often make a product that has a higher value in the market than rough or finished raw lumber. If you already have a tribal sawmill, this can be looked upon as a way to add value to the revenue from your timber resources. Alternatively, the economics of a cut stock operation could help justify investment in a sawmill if you don't already have a sawmill operation. Finally, another market advantage of the cut stock operation is that it provides some market flexibility. Usually, the process and equipment can be adjusted to produce a range of products, so the product line can be switched if necessary. In addition, cut stock products cover a range of wood species, including both hardwood and softwood species, which given you even greater market flexibility. Also, further down the road in the future you might expand from a cut stock operation into making finished products like high value furniture or cabinetry after you have gained some familiarity with the market.

In addition, cut stock plants are usually set up with a number of small woodworking machines, with one or a few workers on each machine. To some extent, each small machine can be operated separately in an efficient manner, without depending on the immediate output of other machines. This means that not every worker must be at the plant at the same time. In the context of tribal community employment, this could offer the advantage of more flexible work schedules, job sharing, and so forth. In addition, technical schools around the country have good training programs on setting up and running cut stock plants, so you can usually obtain good education and advice on how to set up and manage this type of operation. One additional point is that either cut stock products or wood trusses will require wood that is dried, usually by kiln drying, and higher quality products will require that the wood be dried to lower and more uniform moisture content.

Cut Stock & Specialty Lumber Export Opportunities

Finally, one other opportunity area is in the export of cut stock products or specialty grades of lumber tailored to the needs of overseas customers. We know that countries in Europe and East Asia have become leading manufacturers of familiar products like hardwood furniture, and we are already familiar with their wood requirements for those products. For example, there is a big demand by European and East Asian customers for high quality hardwood veneer logs used in furniture manufacture. However I want to discuss a different category of products: specialty cut stock products or specialty grades of lumber that are used in other countries where consumers have different needs and different tastes than typical American consumers.

For example, at least one U.S. manufacturer has been making disposable wood chopsticks out of Aspen wood for export to Japan. It has been

reported that this one manufacturer was planning to produce upwards of 7 million pairs of chopsticks per day (Journal of Commerce, Tuesday, January 31, 1989, p. 124). This may seem like quite a market opportunity, but it can also serve to suggest how difficult such an operation can be. First, in making a specialty product like chopsticks, one may have to go overseas to find the right equipment. Then, assuming that you have the right equipment, you may encounter problems with customer specifications and product quality. Imagine, for example, how finicky buyers can be about the quality of wood in chopsticks! One can imagine that problems like wood stain or rough surface could create real difficulties with the customers.

In a more general context, there are a range of opportunities in the export market for products with which we are usually not very familiar. Interestingly, a number of these products involve opportunities in which foreign customers are buying softwood on the basis of its appearance. In this country we are more familiar with using hardwoods, such as Oaks, Cherry, or Walnut, in applications where good appearance is desirable. Except for a few species like California Redwood or Eastern Red Cedar, we mostly tend to use softwoods in applications where appearance does not matter as much as strength properties, as in construction. Nevertheless, some overseas customers in East Asia for example, do buy softwoods for appearance or decorative purposes. For example, did you know that the Japanese have a big market for softwood flooring (not hardwood flooring)? I understand that they are looking for softwood flooring that has highly visible grain, such as Southern Pine or perhaps Western Larch. We have had visitors at FPL from Europe that tell us of European markets for high quality softwood paneling.

I know of one instance where a buyer from Germany was purchasing select structural grade southern pine lumber in a 2-by-4 inch dimension that was then being sliced in half to produce decorative wood paneling. The European buyers were paying a high premium for the clear straight-grained softwood dimension lumber because of its appearance, whereas in the United States we would think of such lumber only in terms of construction applications, in wood trusses for example.

Another example that I am familiar with is the Japanese practice of buying specialty grades of softwood lumber, sometimes cut to metric dimensions that the Japanese carpenters use. Japan has a rich tradition of using wood, particularly many softwood species, in applications where the appearance of the wood makes a big difference.' For example, a lot of exposed softwood is used in interior design; in that application, good visual characteristics, such as fine-grained appearance, are preferred. The Japanese seem to have a strong preference for wood from old-growth softwood timber that has a fine-grained appearance.

These are just a few examples, and I'm sure that some of you have found other examples in your experience. Generally there are a number of export opportunities in cut stock or specialty grades of lumber for export. The last idea that I want to leave with you concerns how you go about matching visual characteristics of wood that are desired by overseas customers with the kind of wood that you can produce. As I have said, in many examples of making cut stock or specialty grades of lumber for export to East Asia or Europe, we are talking about making a wood product that satisfies certain visual requirements. Often the customers are simply trying to match a wood species that is native in their country with a wood species that we can produce in this country. This may sound very simple but it can create some real headaches, as I think some of you have found out already. The Japanese and Europeans can be very finicky customers when it comes to the appearance of wood.

What I have to suggest is a simple market approach that you might take in dealing with such customers in general. Usually you will be dealing with some kind of middleman, or perhaps you will be dealing directly with an overseas manufacturer or distributor. The overseas dealer or manufacturer should have a pretty good idea about exactly what kind of wood is needed. The problem is in communicating what they need to you, the producer of the wood product.

Sometimes the dealer or manufacturer will come all the way over here to visit you at your sawmill to look at the kind of wood you produce or will come to talk 'with you at trade shows, and sometimes you or your middleman may go all the way over there to talk about their needs.

However, even if everyone is being very honest and friendly it can be very difficult to communicate exactly what the overseas customer needs. This is made all the more difficult by the fact that wood is highly variable in appearance. We all know that no two pieces of wood look exactly the same. When you communicate needs across oceans of distance and language barriers, it is no wonder that there tends to be some confusion. You must keep in mind that these customers are not buying U.S. lumber grades. They may specify a U.S. lumber grade simply because they feel too frustrated in communicating their actual needs.

People whom I have talked to in the wood export business repeatedly tell stories about how difficult it is to satisfy needs of European or Japanese customers. Yet I often hear that the way the marketing is done is to ship our wood products overseas and then wait to see if the customer continues the business, makes a complaint, or cancels the order. That's a hard way to do business!

The alternative that I would suggest is an idea that is based on wood anatomy work that we have been doing at the Forest Products Lab for many years. I owe this marketing idea to Donna Christensen of our Lab, who works in the Center for Wood Anatomy Research.

It seems that our wood identification specialists have also been dealing with the problem of matching wood samples with wood species for many years. This is done mainly for scientific research purposes, but sometimes people want to know about what kinds of wood species will match with a particular type of wood with which they are familiar. Over the years we have learned that there is only one efficient and foolproof way to match wood. The customer needs to send samples of the wood that they are trying to match. This works very well at our laboratory. Once we get a sample in the Lab, we can very quickly tell the customer what kinds of wood will match that sample. If we don't have a sample from the customer, it is almost impossible to make a match and the communication problems are enormous.

Therefore, if you are dealing with overseas customers who are buying wood for its appearance quality, the general idea is to always have the customer send you a batch of wood samples so that you can try to match those samples in your mill.

For example, if you are trying to sell Japanese customers species like hemlock, you probably will not know exactly how the wood will be used or what Japanese wood species they are trying to match. There are hemlock species in Japan (e.g., Tsuga seiboldii), which are not the same as our native hemlock species, and there are also important wood species that appear similar to hemlock, such as "sugi" (Cryptomeria japonica). If you compare samples of these species with native American hemlock, you will notice that some specimens are very similar while other specimens are quite different, because all the species vary quite a bit.

The last idea I want to leave you with is how you go about matching the visual characteristics of wood that are desired by the overseas customers with the kind of wood that you can produce in this country or locally on a tribal enterprise. No two pieces of wood look exactly the same. This is a truism from wood anatomy, we all know this and we shouldn't expect that overseas customers are going to be able to tell us what it is that they are looking for in any kind of letter, correspondence or verbal contact that they might make with us. You may-even travel over there, send trade delegations or have people visiting those countries, but across language barriers and oceans of distance it is impossible, I think, for someone to communicate what the difference is clearly between these two pieces of wood, for example.

The alternative idea comes out of our wood anatomy group at the laboratory. We have large samples of wood specimens from all around the country and we go about this business of helping people match one species with another. But the only foolproof approach that we have determined you can use is to have people send you samples that show exactly what is wanted in terms of appearance, you will find it much easier to sort and select wood for export and you will also be in a better position to make arrangements that are satisfactory to both you and the customer. If you are thinking of going in the Japanese market or Korean market or whatever, where they are buying wood where they want a certain set of visual characteristics I would recommend that you have them send you a box of wood samples so that you can go about looking at that wood and seeing what can be done in your mill or your area in terms of sorting and producing a certain amount of that type of wood. This will set you up in a better bargaining position, able to tell the customer, "We can separate 20 per cent of our material out of the mill and meet that visual requirement, but you are going to have to give us a little more because we still have 80 per cent of the wood that has got to go to another market."

That is basically the idea I wanted to leave with you. You need to look at samples of wood from the overseas customer to get some idea of what it is they are looking for.

I should also mention I have some samples I brought along from our wood anatomy collection. Some of you may want to look at these. It is very interesting. We have Eastern and Western Hemlock from the U.S. and then samples of Japanese Hemlock species and also "sugi" which is a Cryptomeria species, a different wood species. In some cases they match very well, in others they don't. If you are looking across the Pacific Ocean and trying to communicate with these people about how you match the wood they are looking for it is almost impossible unless you see a piece of the wood.

In summary there are substantial changes taking place in wood product technology, and increasing ability to use lower quality timber, more hardwoods, but in the midst of these changes there are still opportunities to manufacture high value wood products and particularly products that depend on the unique appearance character of high quality wood. Thank you.

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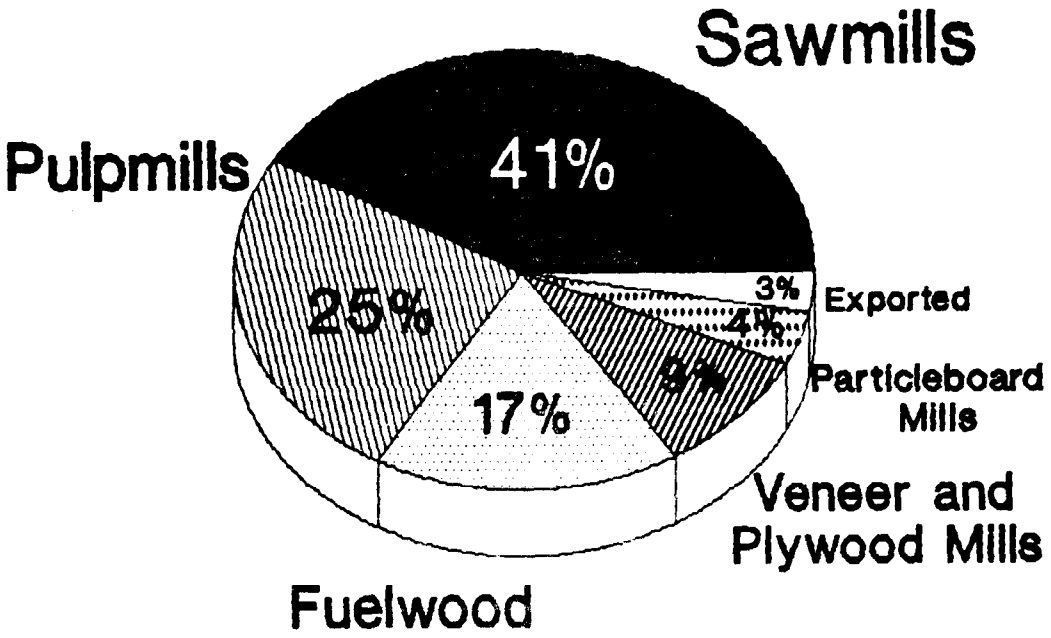

Figure 1.--Roundwood supply to primary processing plants in the U.S. (percentages of total, 1986).

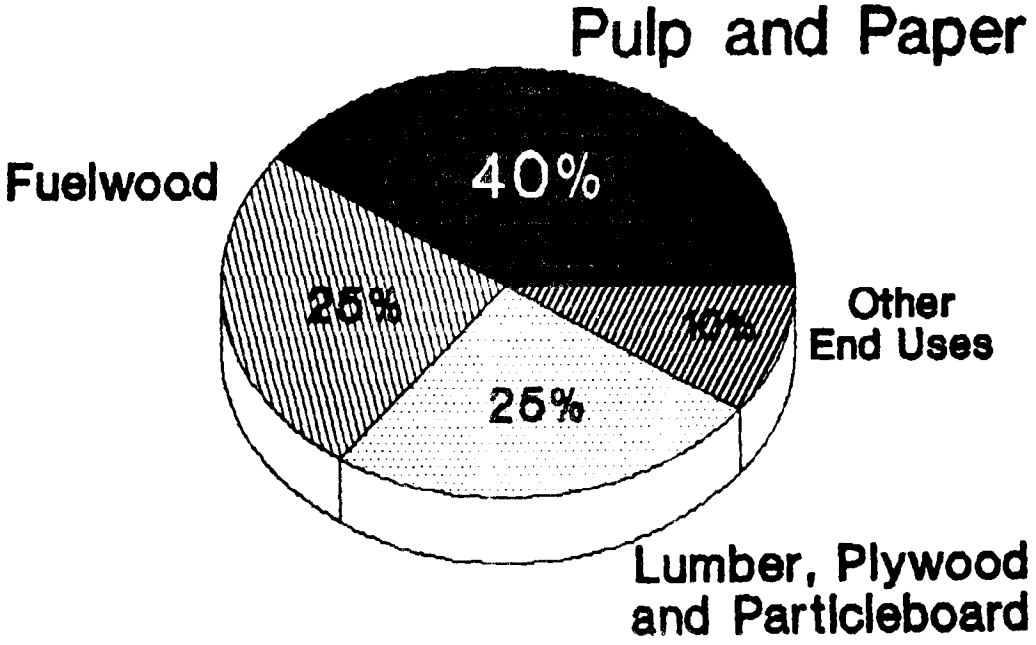

Figure 2.--Final product distribution of wood and wood fiber in the U.S. (percentages of total, 1986).

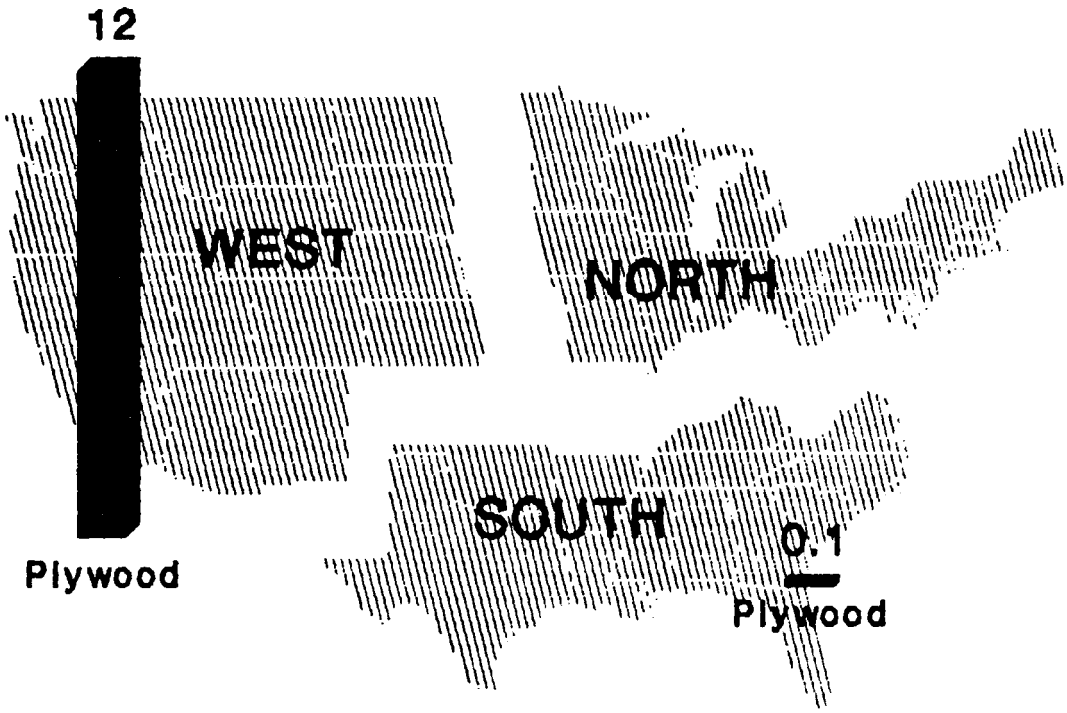

Figure 3.--Distribution of U.S. structural wood panel production in 1964 (billions of square feet, 3/8-inch basis).

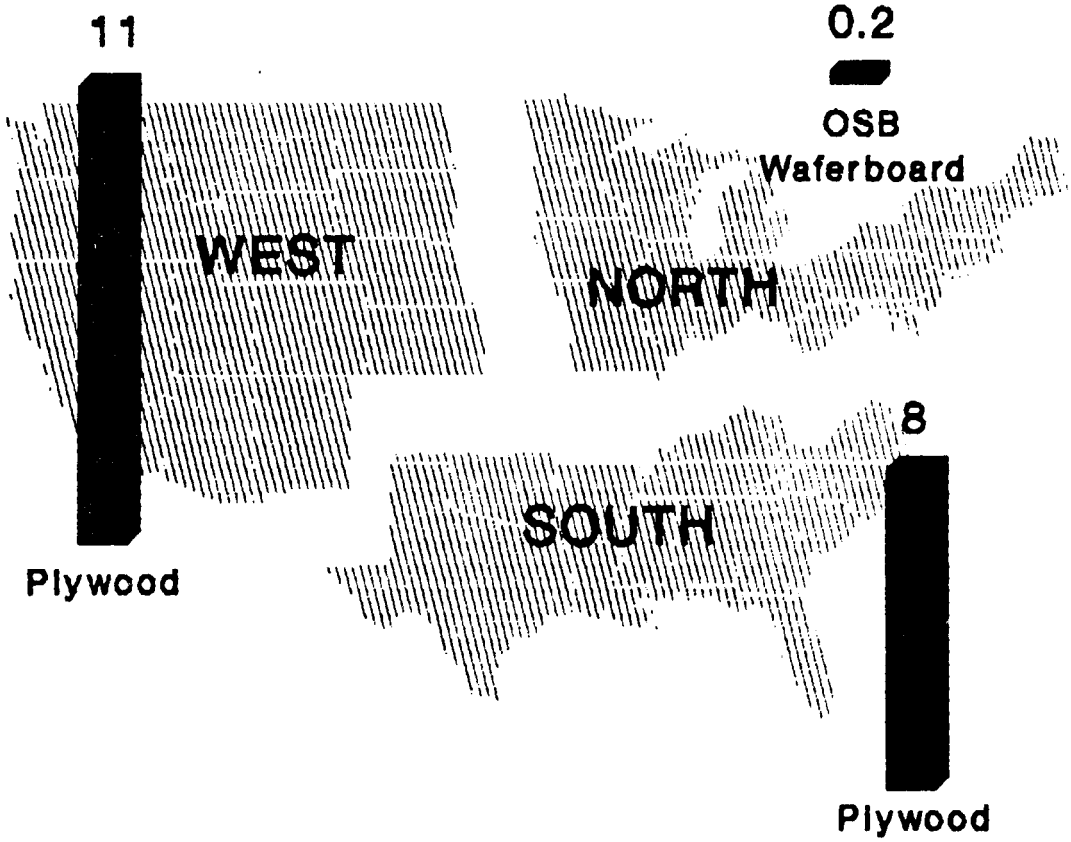

Figure 4.--Distribution of U.S. structural wood panel production in 1979 (billions of square feet, 3/8-inch basis).

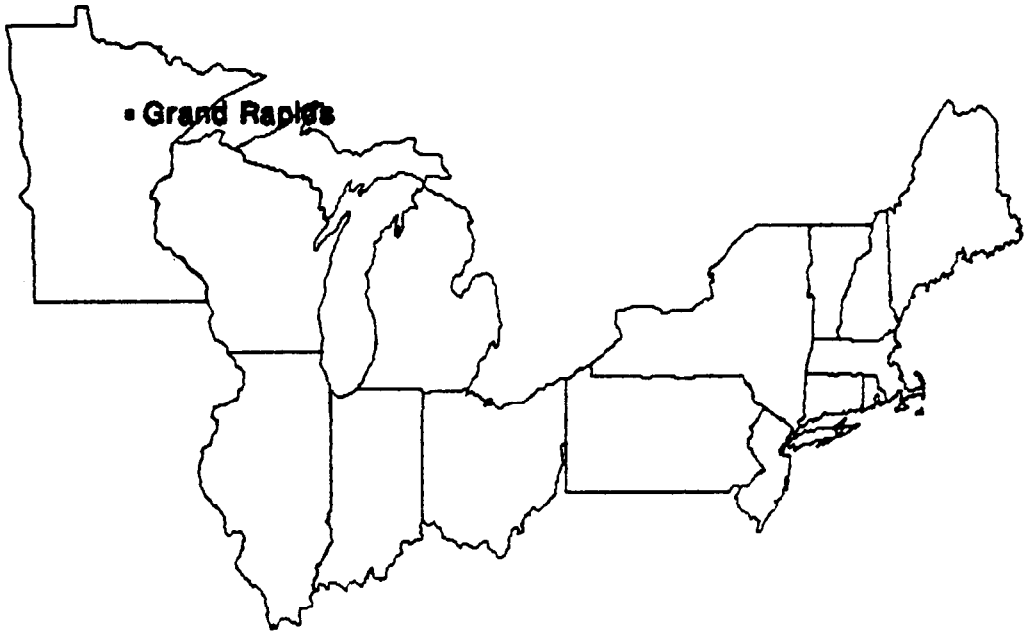

Figure 5.--Location of U.S. OSB/waferboard mills (one mill) in 1979.

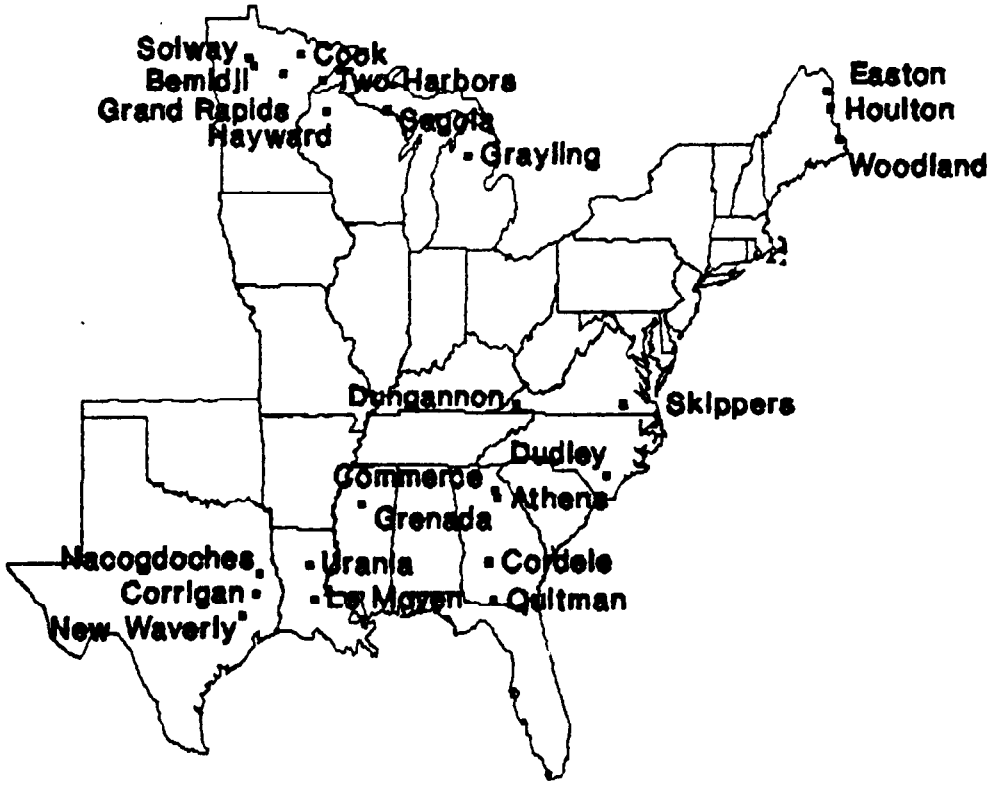

Figure 6.--Location of U.S. OSB/waferboard mills in the North and South (24 mills) in 1989.

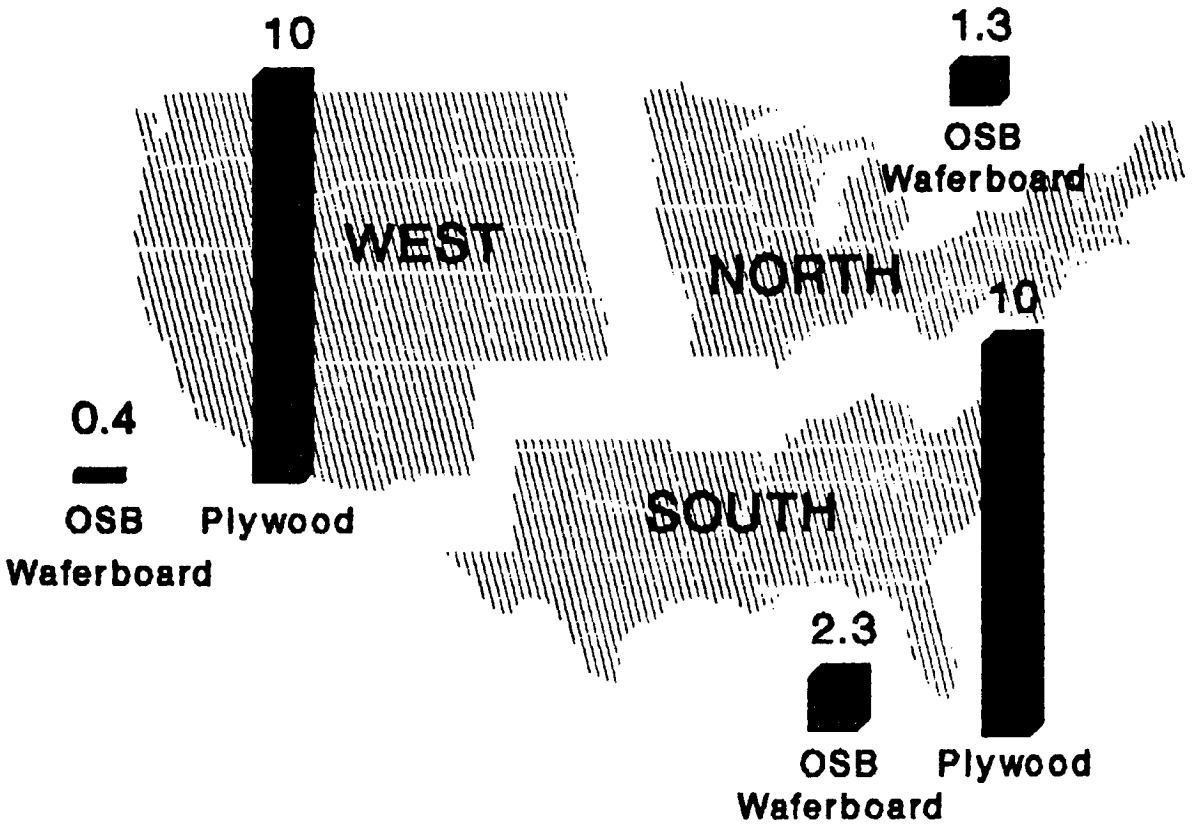

Figure 7.--Distribution of U.S. structural wood panel production in 1988 (billions of square feet, 3/8-inch basis).

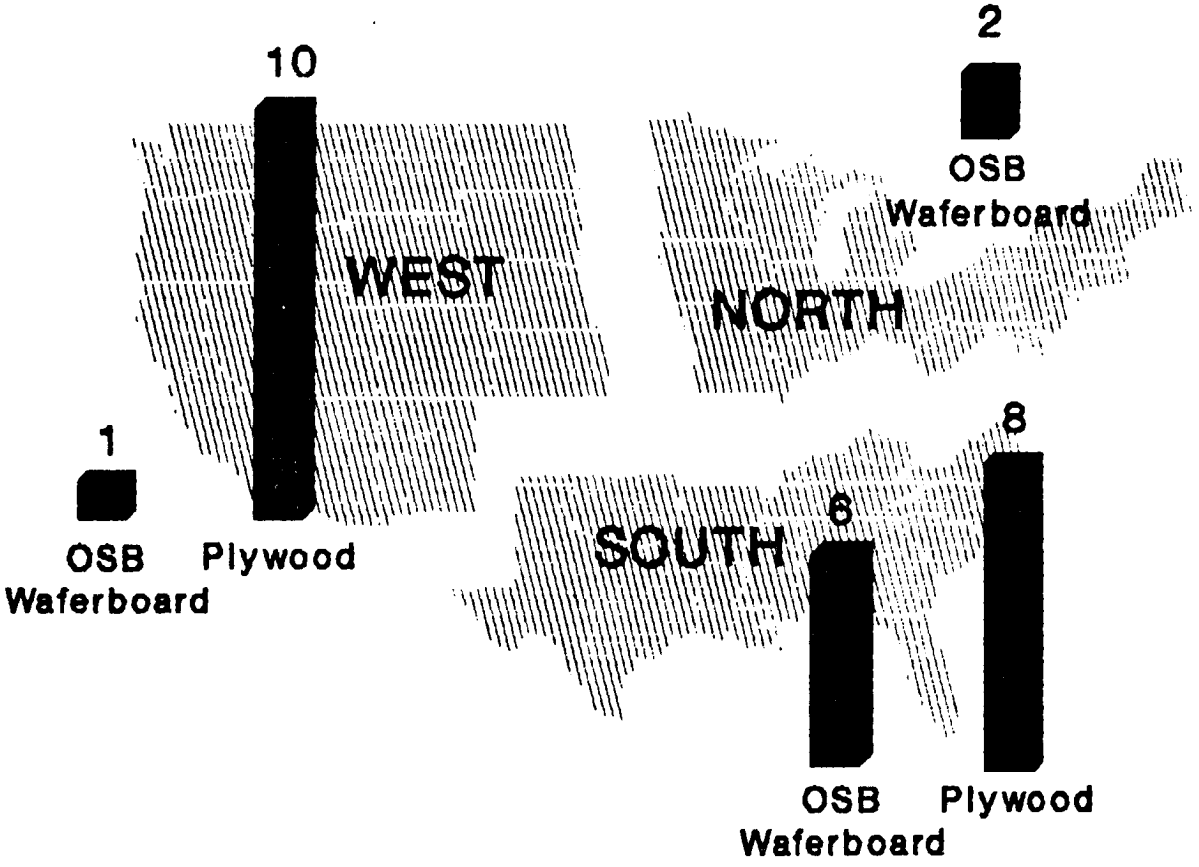

Figure 8.--Projected distribution of U.S. structural wood panel production in the year 2010 (billions of square feet, 3/8-inch basis).

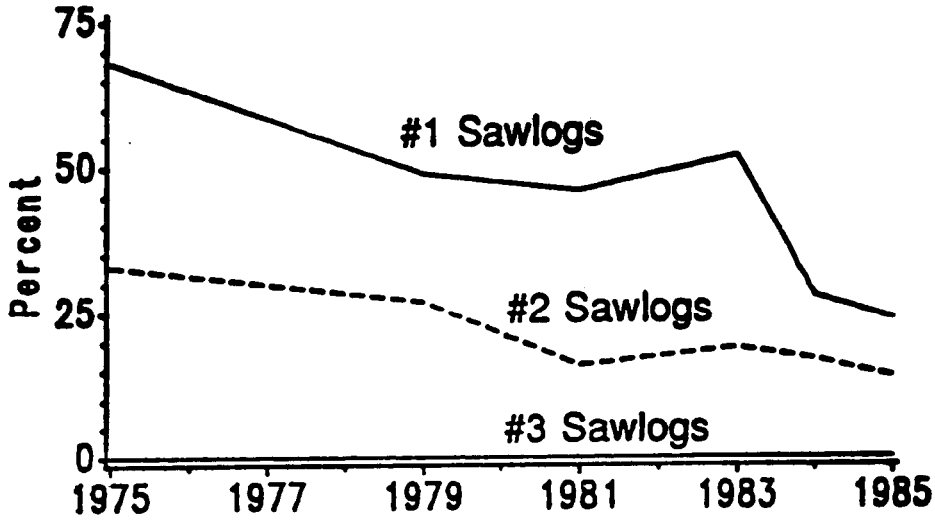

Figure 9.--Price premiums for high grade Douglas-fir relative to #3 sawlogs (Spelter 1987).

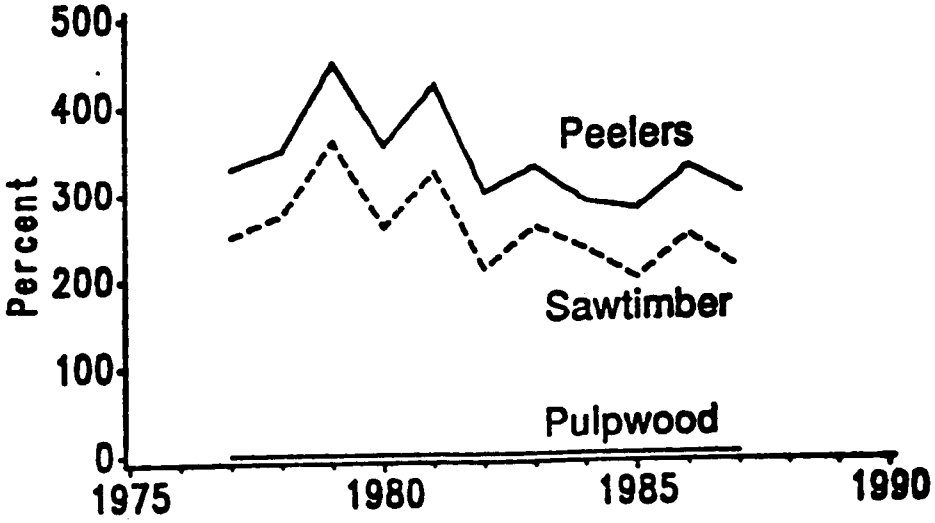

Figure 10.--Price premiums for high grade southern pine relative to pulpwood (Spelter 1987).

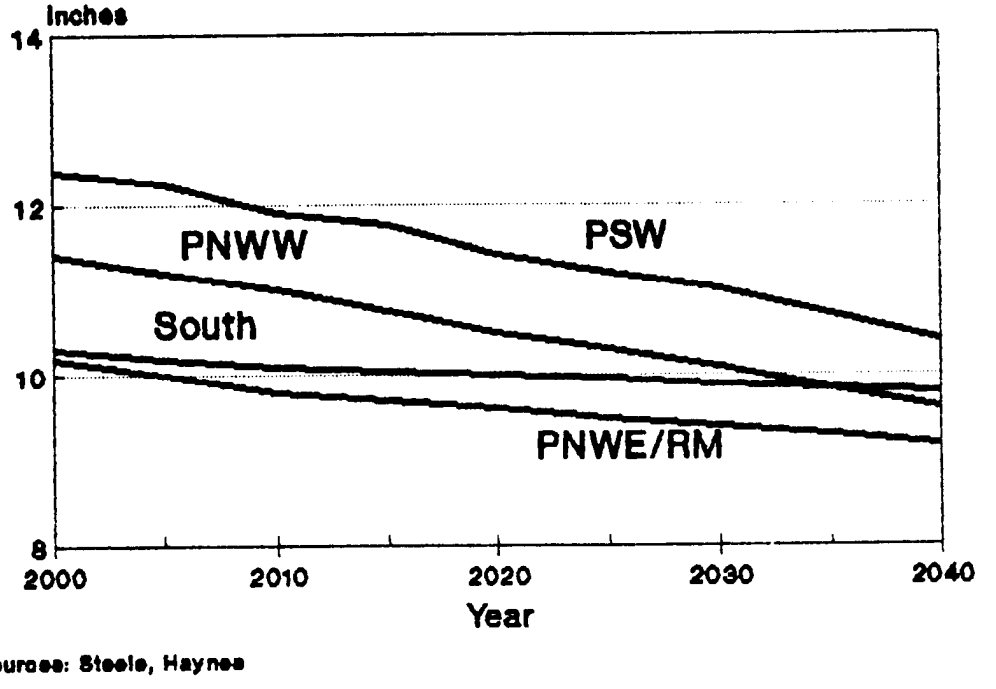

Figure 11.--Preliminary projections of softwood sawmill log diameters, 2000-2040, by region (Haynes 1989).

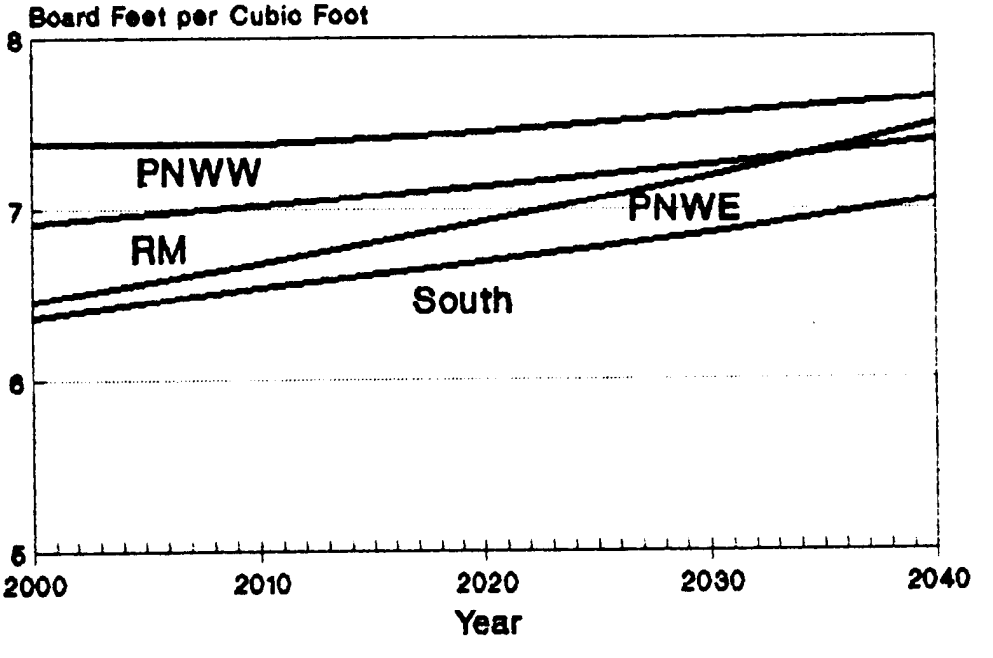

Figure 12.--Preliminary projections of softwood sawmill lumber recovery factor (lrf), 2000-2040, by region (Source: Skog, FPL).

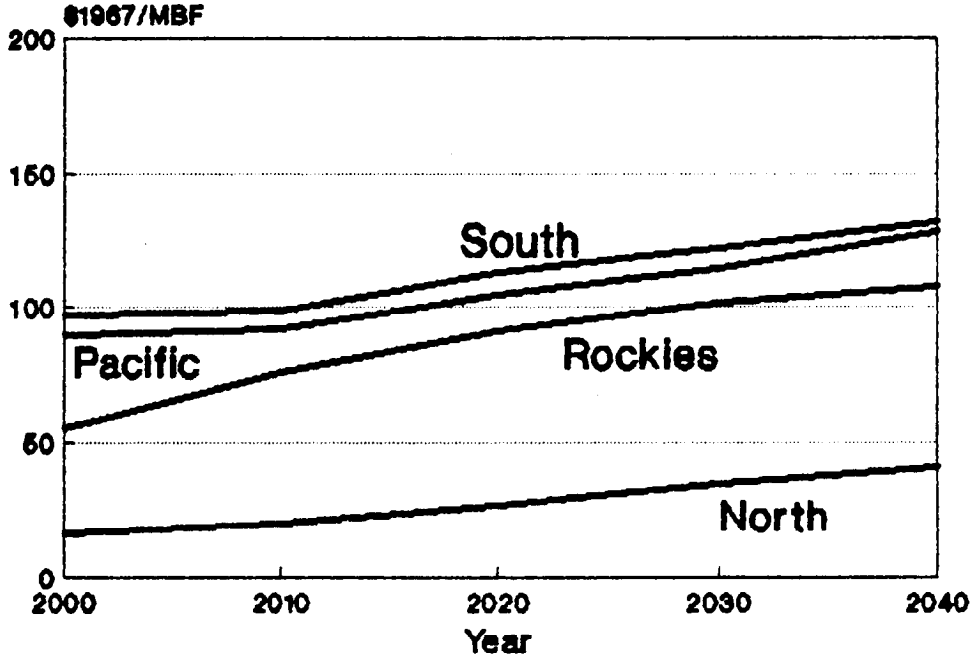

Figure 13.--Preliminary projections of softwood stumpage prices, 2000-2040, by region (Haynes 1989).

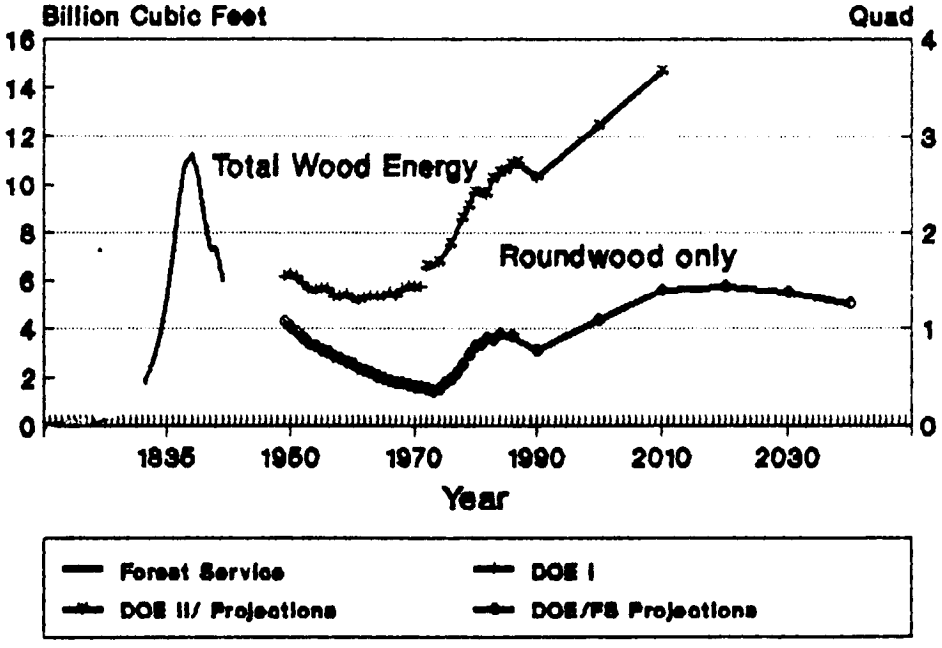

Figure 14.--Long-term historical trends in fuelwood use within the geographic area of the United States (from 1800's) and projected future fuelwood use, billions of cubic feet (Source: Skog, FPL).

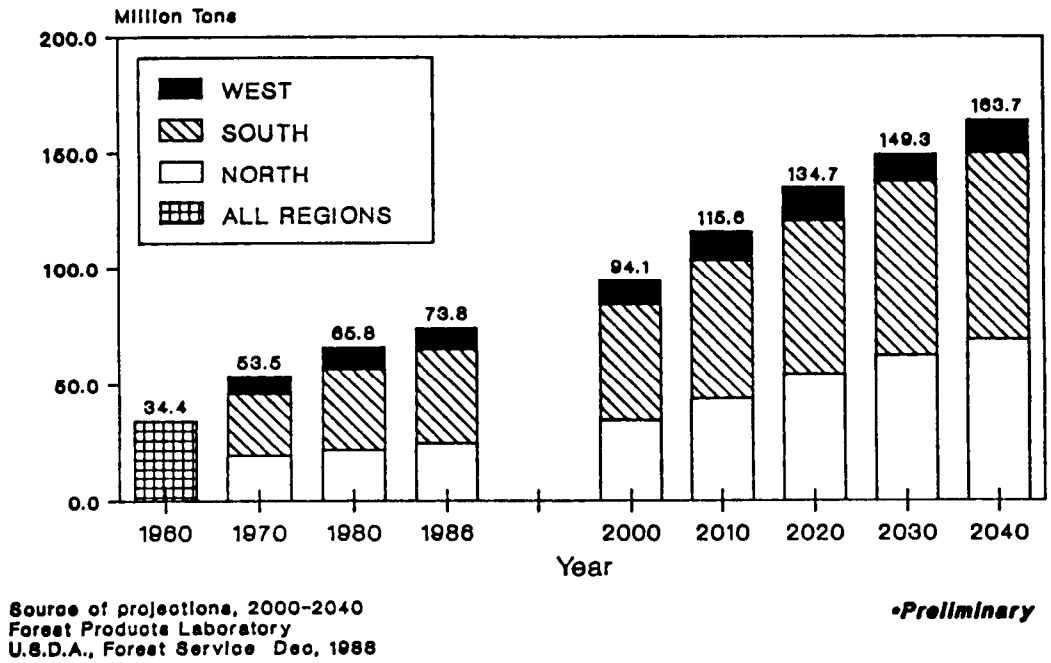

Figure 15.--Historical and projected trends in U.S. paper and paperboard production (millions of short tons).

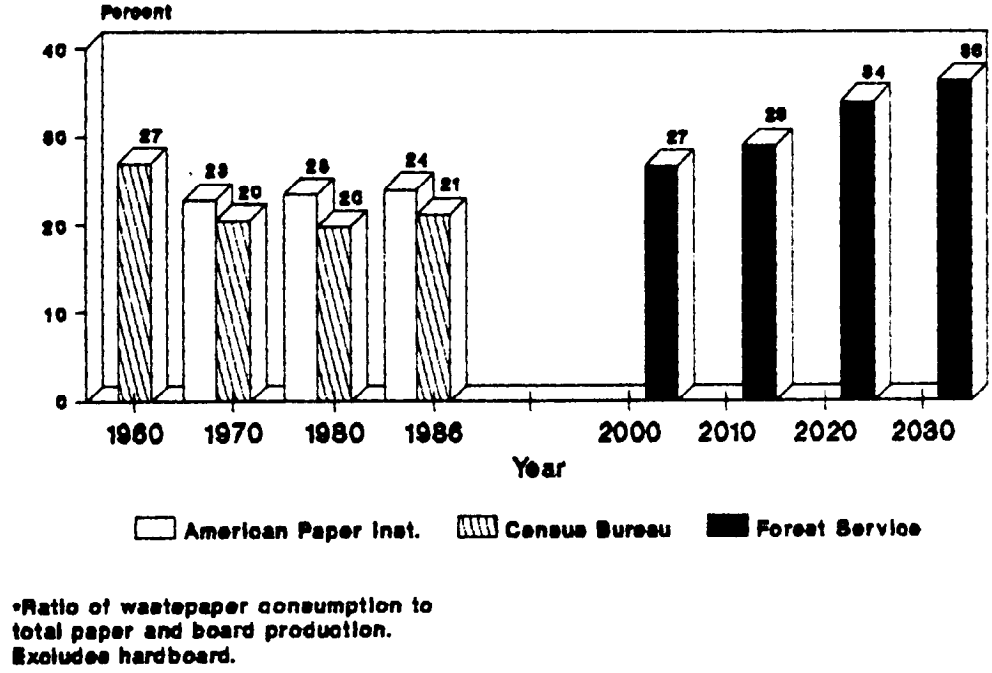

Figure 16.--Historical and projected trends in the ratio of wastepaper consumption to total paper and board production.

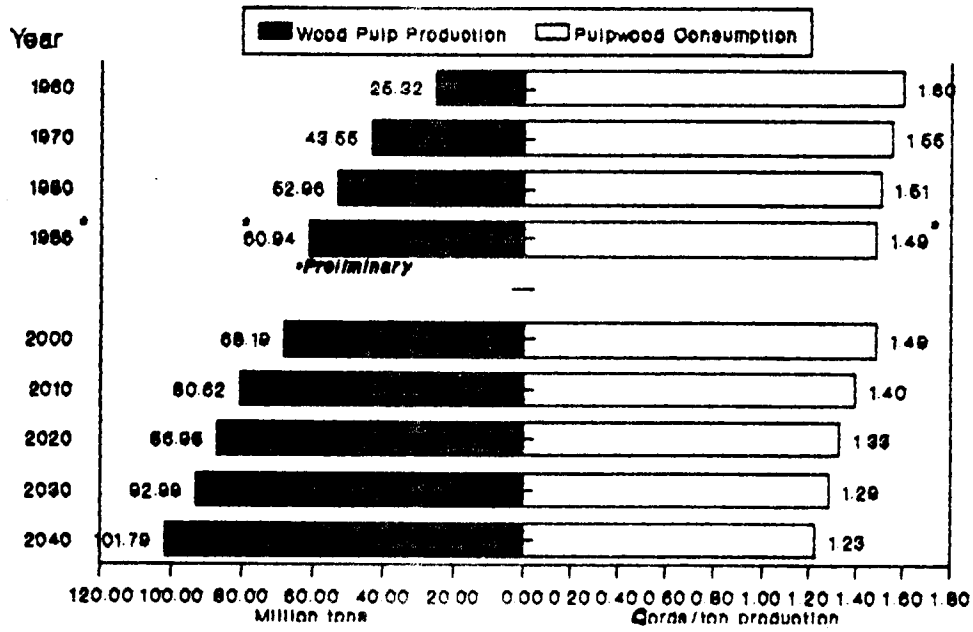

Figure 17.--Historical and projected U.S. pulp production and consumption of pulpwood at pulp mills (pulp production in tons, and pulpwood consumption in cords per ton of pulp).

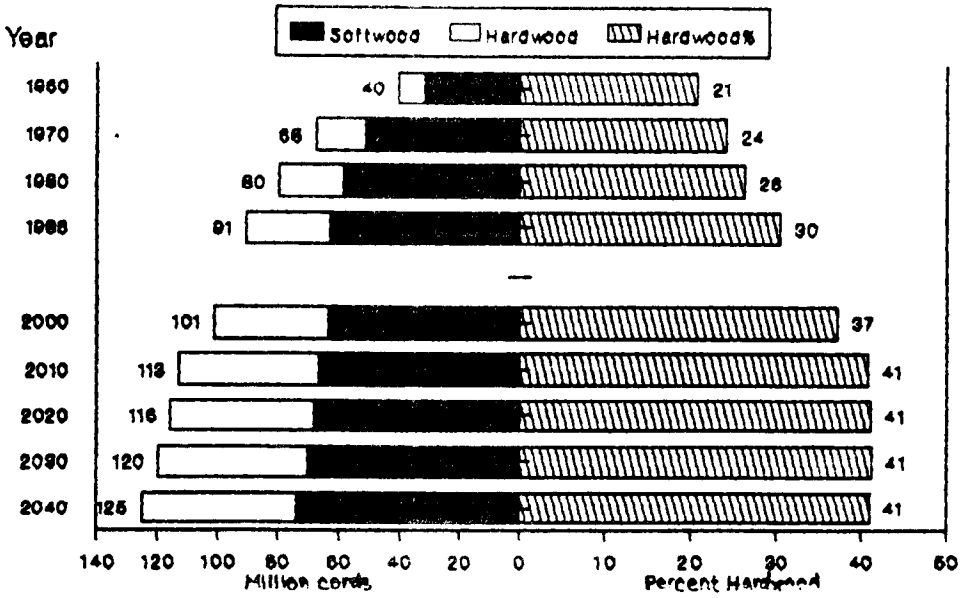

Figure 18.--Historical and projected U.S. pulpwood consumption (in cords) and hardwood as a percent of the total.