

U.S. TIMBER SUPPLY AND DEMAND IN THE UNITED STATES, 1996 TO 2050

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ABSTRACT

The U.S. has a century history of periodic national assessments of timber supply and demand. These assessments set the context for broadscale forestry issues such as the small diameter timber issue in the interior U.S. west. Here the solid wood products industries and public lands dominate the forest sector. Both complicate the already complex small diameter issue.

Keywords: timber resources, timber harvest, supply, demand.

INTRODUCTION

For more than a century, the United States has developed periodic national assessments of future supply and demand prospects for timber that have shaped perceptions of resource trends and needs for new or modified forest policies. In this paper, I will briefly discuss the prospective market prospects for the U.S. forest sector using information from the most recent assessments and in that context summarize several possible barriers to improving the utilization of small diameter timber in the Interior West. My definition of small diameter timber is in the context of today's management where small refers to average stand diameters of 8 inches, and where the preponderance of trees are less than sawtimber size.

These projections are the consequence of a myriad of assumptions with the following five being the most important.

1. Continued economic growth is expected to lead to higher incomes and increased consumption of wood.
2. The U.S. population is expected to grow by 126 million people over the next 50 years. If nothing else changes, this will increase wood demands by nearly 9 billion cubic feet per year.
3. The expectation that the housing sector will remain strong both in terms of new housing as well as repair and alteration.
4. The assumption that the growing availability of wood on world markets will meet our increase in consumption.
5. The assumption that public harvests will further diminish as a share of total harvests.

MARKET PROSPECTS FOR THE U.S. FOREST SECTOR

Projections to 2050 show the forest products sector changing and expanding to meet a 40% increase in U.S. consumption of forest products by 2050¹. The rate of in-

crease is less than one-third the annual rate of increase over the last 33 years due, in part, to declining use of paper and paperboard per dollar of Gross Domestic Product, and projected relatively stable housing starts. This increased consumption would be met by (1) an increase in U.S. timber harvest of 23%, (2) an increase in log, chip, and product imports of 85%, and (3) an increase in use of recovered paper of 85%. The proportion of total roundwood needed for domestic product consumption that comes from domestic timber harvest decreases from 80 to 73% by 2050. Projections to 2050 in the current RPA Assessment show the forest products sector continuing to change, with U.S. timber harvest expanding by 24% to meet these increased consumption needs. As a result of steady improvement in growth and productivity on U.S. forestlands, this harvest increment can be accommodated with continued expansion in inventory despite additional erosion in the area of the private timberland base.

Per capita U.S. wood and paper product consumption harvest of roundwood remains just under three-quarters of a ton per person per year while per capita U.S. timber harvest declines. Consumption shifts toward pulp and paper products; from a 27% share in 2000 to a 37% share by 2050, and the share of composites increases from 3 to 7%. Oriented strandboard production displaces softwood plywood further eroding the importance of solidwood products. Hardwood lumber production grows more slowly than softwood lumber production. Softwood lumber imports from Canada rise in the near term, and after 2015 softwood lumber production increasingly expands largely in the South and, to a limited degree, the Pacific Northwest. Pulp, paper, and paperboard production increases most in the South, mainly in the Southcentral region.

Sawtimber prices are projected to increase over the next fifty years, but at a rate (0.5% per year) considerably below that of the past 50 years (1.9 per year). Pulpwood prices remain relatively low, but hardwood pulpwood prices increase at the end of the projection period because of limitations on availability of harvestable hardwoods on nonindustrial private timberlands in the South. Prices for softwood and hardwood lumber will increase at about the same pace as for sawtimber. Prices for oriented strandboard increase faster than for softwood plywood, but remain less than the softwood plywood price. Prices for nonstructural panels and for paper and paperboard remain relatively stable through 2050.

With lumber and plywood comprising a decreasing share of total forest products output, virtually all of the projected 24% increase in U.S. harvest is in nonsawtimber trees—trees used for oriented strandboard or paper and paperboard. The share of total harvest from nonindustrial private land increases from 61 to 63%. Softwood timber inventories increase by 53% mostly on public timberlands. Hardwood inventories, almost entirely in private forests, increase by

¹These projections are described in Haynes (in press).

27%. There are similar changes for softwood inventories across regions. Changes for hardwood inventories across regions, however, are dissimilar with a modest decline in the South. Over the next 50 years, the species composition is projected to remain comparable to current conditions with the exception that in the South upland hardwood acres decrease while planted pine acres increase. For the most part, age structure of forests will shift toward a greater proportion of acres in sawtimber with the exception that the proportion of area in sawtimber will decrease for private hardwood timber land in the South and for private softwood timberland in the West. However, in the West, the sawtimber proportion will increase after 2020 with the structure of U.S. forests projected to remain comparable to current conditions.

The bulk of the U.S.'s timber harvest will occur in the East (80% in 1997 and 82% in 2050) and especially in the South (63% in 1997 and 67% in 2050). Most of the increased softwood harvest in the U.S. comes from the South. Most of the projected agrifiber supply is in the East. By 2050, roughly 60% (two-thirds) of the softwood timber harvest from private lands will come from plantations (in the South and the Pacific Northwest west side) that occupy about 30% of the softwood timber land area and less than 20% of the total timberland area base.

Canada is expected to provide the primary source of imports (over 75%), but imports from other nontraditional sources are also expected to increase. Canada will provide roughly 30% of U.S. softwood lumber consumption over the next 50 years, but imports from other countries (Eastern Europe, the Nordic countries, Southern hemisphere countries) are expected to increase to 5% of U.S. softwood lumber consumption. Canada provides 80% of U.S. paper and paperboard imports that accounts for 14% of U.S. pa-

per and paperboard consumption. Other countries provide imports for 3% of consumption.

PROSPECTS FOR THE INTERIOR WEST

These projections can be scaled down to the Interior West—a region made up of the Pacific Northwest eastside (PNWE), Northern Rockies, and Southern Rockies. In 1997, this region accounted for 15% of the softwood lumber, 12% of the softwood plywood, 11% of the softwood harvest, and 28% of the softwood timber inventories of the United States. The proportions for lumber and harvest have declined from higher levels in the 1970s. The proportions for inventory and plywood represent slight increases over the past 30 years.

The Interior West, more than other regions of the U.S., is dominated by the solid wood products industry. Some 78% (Table 1) of the total harvest in 1997 was used for various sawtimber purposes. This proportion will decline slowly over the next 50 years to 64%. Table 1 also shows increased harvests in the Pacific Northwest eastside as lumber production expands in that region. Table 2 shows the projection for the main two solid wood products—softwood lumber and plywood. Lumber production expands in the PNWE reflecting improvements in timber inventories as shown in Table 3.

These tables reveal possible barriers to effectively manage the densely stocked stands of small diameter trees common in the Interior West. These barriers include (1) bleak future prospects for the processing industry that complicates utilization of small diameter timber, (2) stumpage prices that offer little incentive to land owners/managers to improve stand conditions, (3) and changes in ecological conditions that complicates an already complex problem.

Table 1.—Softwood timber harvest, sawtimber and nonsawtimber, in the Pacific Northwest eastside, Rocky Mountains, and the United States, by Region, 1977-96 with projections to 2050.

Item	1977	1986	1991	1997	Projections				
					2010	2020	2030	2040	2050
----- Million cubic feet -----									
Rocky Mountains:									
Sawtimber	806	836	754	616	481	492	498	506	504
Nonsawtimber	88	138	179	203	257	292	324	354	370
Total	894	974	933	819	738	784	822	860	874
Pacific Northwest eastside:									
Sawtimber	504	479	397	283	248	289	334	388	435
Nonsawtimber	26	72	57	47	54	57	60	62	66
Total	530	551	454	330	301	346	394	450	501
United States:									
Sawtimber	7,137	7,685	6,494	6,336	5,244	5,514	5,555	5,683	5,978
Nonsawtimber	2,730	3,107	3,854	4,217	4,432	5,333	6,286	7,009	7,688
Total	9,867	10,791	10,348	10,553	9,675	10,847	11,841	12,692	13,666

Source: Haynes, In press.

Table 2.—Production of lumber and plywood in the Pacific Northwest east side, Rocky Mountains, and the United States, by Region, 1977-97 with projections to 2050.

Item	1977	1986	1991	1997	Projections				
					2010	2020	2030	2040	2050
----- Million board feet -----									
Lumber:									
Rocky Mountain	4,328	4,584	4,417	3,844	3,061	3,254	3,390	3,549	3,587
Pacific Northwest east side	2,532	2,755	2,274	1,579	1,384	1,795	2,255	2,798	3,356
United States	31,185	35,188	31,475	36,670	32,467	36,079	37,444	39,546	43,310
----- Million square feet , 3/8"basis-----									
Plywood									
Rocky Mountain	1,223	1,026	1,194	1,015	998	900	835	813	828
Pacific Northwest east side	999	1,026	1,005	1,079	1,133	1,107	1,100	1,104	1,104
United States	19,285	22,442	18,747	16,711	12,397	11,195	10,800	10,777	10,761

Source: Haynes, In press.

Table 3.—Softwood timber harvest, growth, and inventory in the Pacific Northwest east side, Rocky Mountains, and the United States, by Region, 1952-97 with projections to 2050.

Item	1952	1962	1970	1976	1986	1991	1997	Projections				
								2010	2020	2030	2040	2050
----- Million cubic feet -----												
Rocky Mountain:												
Harvest	497	684	812	773	876	996	612	781	825	864	902	912
Net annual	1,101	1,256	1,446	1,594	1,956	1,985	2,06	2,251	,094	1,921	1,796	1,696
Inventory	87,545	93,222	94,275	95,111	100,298	101,487	114,682	133,311	148,578	162,265	174,359	185,255
Pacific Northwest eastside												
Harvest	348	454	548	592	687	593	513	332	377	425	80	524
Net Annual	498	695	652	614	645	640	847	933	934	919	909	901
Inventory	16,62	15,059	15,532	15,493	15,580	17,337	22,343	26,771	29,944	32,958	35,848	38,422
United States												
Harvest	7,522	7,321	8,695	9,510	11,289	10,983	10,101	9,848	11,021	12,009	12,818	13,674
Net annual	7,734	9,611	11,338	12,501	12,521	11,973	13,553	15,748	16,237	16,562	16,733	16,385
Inventory	431,789	449,755	460,002	466,956	452,911	449,893	483,842	548,985	608,342	660,970	707,392	742,088

Source: Haynes, In press.

Bleak Industry Prospects

The timber industry in the Interior West has declined much in the past decade. In terms of importance in the U.S., it reached its peak in the 1960-70s when it supplied roughly 15% of the U.S. softwood harvest. Projections (Table 1) reveal a continued diminishing role for the Rockies in percentage terms. There is some increase in harvest after 2020 as private timber inventories improve. Increasingly, the forest products industry in the Interior West becomes dominated by the softwood lumber industry. After 2020 this industry shows improvement as private timber inventories improve. This increased production of lumber

is accompanied by an increase in mill residues further reducing markets for small diameter timber for use as fiber logs (a form of nonsawtimber use).

Stumpage Price Projections

The stumpage price projections for U.S. regions are shown in Figure 1. Stumpage price projections for the Interior West increase slightly as do prices in all U.S. regions. But these price projections offer modest incentive to improve stand conditions. Real stumpage prices are expected to increase by percent per year. Relative to other regions, stumpage prices in the Interior West are generally lower reflecting limited end product markets.

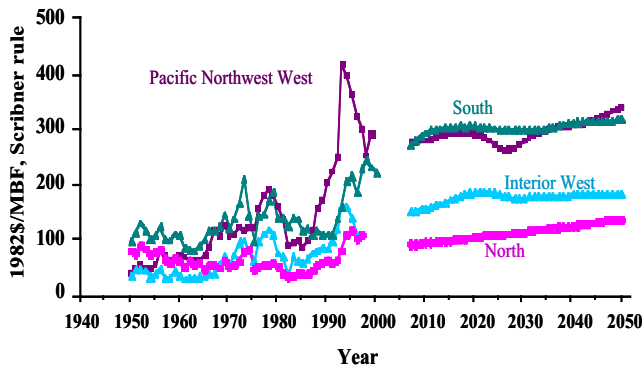


Figure 1.—Softwood sawtimber stumpage prices in 1982 dollars per thousand board feet, Scribner log rule by major U.S. region, with projections to 2050.+

Changes in Timber Resources

In general, the condition of U.S. timber resources are improving, but in the Interior West expected changes in ecological conditions will complicate an already complex problem. For example, the projected 61% increase in inventory conditions shown in Table 3 reflects an improving timber resource situation. Almost all of this increase in timber inventories is on public timberlands where there is a general aging of timber inventories

The most dramatic changes in the timber inventories are shown in Figure 2. A significant shift in the structure of the inventories is expected. Looking at the age class struc-

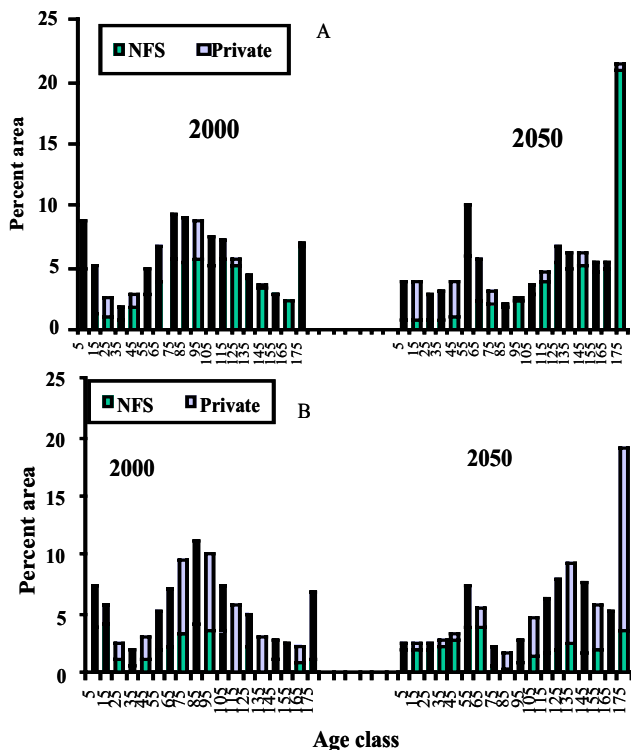


Figure 2.—Age class distribution for all forest types on timberland area for the Pacific Northwest: East (A) and Rocky Mountains (B), by ownership.

ture of the inventories, a shift is expected from the unimodal distributions shown on the left to more of a bimodal distribution shown on the right. The later type of age class distribution suggests there will be fewer mid-seral forests by 2050. In the Rockies, most of the younger stands will be private timberlands while the older forests will be found on public lands. Depending on the characteristics of the various timber types, the conventional notions of the forest health issue may change. Given the propensity of private owners to harvest timber, there may be fewer forest health issues in younger stands in timber types harvested for solidwood products. Also, depending on the characteristics of the various forest types, we may have more or less forest health issues in the public timberlands. For example, in some forest types, successional characteristics within stands may allow those stands to grow out of the attributes that contribute to being a contemporary health concern. For other forest types a gradual aging may exacerbate an already severe problem.

SUMMARY

While much hope is expressed for timber markets to evolve in aiding the management of a perceived serious forest health issue in the Interior West, expected changes elsewhere in the U.S. forest sector are posed to preempt some of these market opportunities.

How can markets be harnessed to assist in the management of interior forests?

First, we need to exploit the opportunities offered by the solidwood products industry. How can public land be a more reliable supplier of sawtimber to help offset some of the uncertainties involved in operating a successful forest products business?

Second, what are realistic opportunities for smaller scale enterprises utilizing lesser used species and sizes of timber? By realistic we have to consider what can be attractive in capital markets and offer a fair wage to workers.

Third, we have not fully considered the public's willingness to accept and pay for restoration forestry activities. Is there a possibility to combine some traditional activities (like thinning and under burning) with efforts to restore selected ecological conditions?

REFERENCES

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