



## APPENDIX H THE REGIONAL TIMBER SUPPLY-DEMAND SITUATION IN CALIFORNIA

This appendix was created to address public comment that requested additional information on the broad level timber supply and demand situation in relation to supplies from individual National Forests. Existing information from recent RPA assessments, the Pacific Southwest Regional Guide, Forest Service research publications, and the State of California's Forest and Range Resource Assessment Program was used for this purpose.

### Historical Harvests from Public and Private Lands - Statewide

Timber harvest in California has been in a downward trend for over 30 years. In 1955 timber harvest in the state from all lands totaled 6 billion board feet. In that year, harvest from private lands was 4.9 billion and harvest from National Forests was 1.0 billion. Less than 100 million board feet were harvested from other public lands. Since that time, total harvest in the state has fallen steadily. By 1982, at the bottom of the last recession, harvests had fallen to 2.5 billion board feet. Since then, annual harvests have rebounded to 4 billion board feet. Harvest from private lands fell to 1.5 billion board feet in 1982 and have since rebounded to 2.2 billion board feet. Harvest from National Forests increased to a peak of 2.36 billion board feet in 1968. National Forest harvests then trended downward to a low of 0.9 billion board feet at the bottom of the last recession and have since rebounded to 1.96 billion board feet. Harvests from other public lands have been relatively stable at near 100 million board feet for the last three decades (see Table 1).

As shown in Table 1, harvest levels fluctuate widely from year to year rather than following a smooth pattern. Year to year variations are influenced primarily by changes in housing markets and general business conditions. Only over the long term do timber inventory and growth levels limit harvests.

### Statewide Demand for Timber Products and the Relationship to Harvest Levels

With a population that has grown faster than the national average to over 26 million people and a high level of income per capita, California is one of the largest markets for lumber, wood, and paper products in the world. When discussing the relationship between the demand for timber products (lumber, wood, and paper) and the demand for timber harvest (stumpage), it is necessary to translate the demand for timber products into its timber harvest equivalent. Expressed in these terms, the demand for timber has been increasing, but at a slower rate than the growth in population. While the population has been growing, per capita consumption of timber has been declining. This has occurred due to the introduction of labor and material saving technologies in both timber product manufacturing and in industries that use manufactured timber products. The result of these technological innovations has been a drop in per capita consumption of timber from 390 board feet annually in 1950 to 360 board feet annually in 1983. However, because population in the state grew from 10.6 million in 1950 to over 26 million at present, total demand increased from 4.1 billion board feet annually in 1950 to 9.3 billion board feet annually at present.

While the demand for timber has been increasing, timber harvests in the state have been decreasing. The difference between the growing demand and the declining supply has been made up by increased imports to the state, primarily from Oregon, Washington, and Canada. The state has changed from a net exporter to a net importer of timber products over the last three decades.

California now relies on imports for more than one half of its overall timber product needs. Although California receives only a small proportion of its imports from Canada, Canadian shipments to the U.S. have a significant effect on the state's ability to import timber products from the Pacific Northwest. In contrast to California's reliance on imports, the bulk of the timber products produced in both Washington and Oregon are exported to other states and countries. Increases in Canadian shipments to the eastern half of the U.S. have displaced timber products from the Pacific Northwest. The result has been an increase in the availability of timber products from the Pacific Northwest for California markets. Increased production in the South has also been displacing the Pacific Northwest in eastern markets, which has also increased the availability of products from the Northwest in California markets.

#### Broad Level Socioeconomic Effects

About 95 percent of California's population lives in urban areas. As consumers, the primary effect of changes in harvest levels in the state on them is a change in prices paid for timber products. A reduction in timber harvests in the state reduces competition among suppliers, raises market prices, and leads to increased use of imported products. Econometric analysis done for the 1985 RPA indicates that a one billion board foot change in harvest level would change lumber prices by about three percent. This translates into a \$250 change in the price of the typical new house at current conversion efficiencies. For the U.S. economy as a whole, this would amount to a cost to home buyers of about \$400 million annually.

Another effect on the urban population is through "indirect and induced" employment. While the employment effect of changes in harvest levels is felt most strongly in the communities where the logging and sawmilling takes place, some broader level employment effects also occur. This is because most firms that manufacture and supply goods and services to logging and sawmill companies are typically located in the major urban centers rather than in the rural areas where the logging and milling takes place.

Logging and milling by itself typically requires 4-7 person years of employment per million board feet processed. Newer, more specialized and automated mills using readily accessible timber are at the bottom of this range, while more labor intensive operations are at the top of this range. This direct employment generates indirect employment in firms that supply goods and services to logging and milling firms and induced employment in firms and governments providing goods and services to those employed directly and indirectly. In undeveloped rural areas there is little if any indirect and induced effect because suppliers are located outside of the area and logging and sawmilling employees must "drive into the city" to make major purchases. In addition, on most National Forests a portion of the logs harvested are trucked well outside of the primary zone of influence for

manufacturing into lumber products. As a result, total statewide employment effects from changes in harvest levels are larger than employment effects occurring in the primary zones of influence for individual National Forests. Employment effects on a statewide basis range between 10-20 person years per million board feet of timber harvested. These employment effect estimates were made with input-output models constructed by the Forest Service and the U.S. Department of Commerce. They reflect present technologies. As the trend toward increased timber utilization efficiency continues, employment generated per unit of timber processed is expected to decline.

#### The Outlook for Timber Supplies - Private Lands

Based on an examination of timber growth and inventory levels compared to historical harvest levels, timber supplies from private lands in California can be maintained or increased over present levels over the 10-15 year life of the Forest Plans. Recent harvest levels and timber growth and inventory levels are shown in Table 2. Private harvests averaged 2 billion board feet annually over the period 1978-1985. This compares with sawtimber growth on private lands of 2.3 billion board feet annually. Current private sawtimber inventory is 86.8 billion board feet or the equivalent of a 43-year supply (not counting growth) at current harvest rates and utilization standards. As timber utilization efficiencies increase, the effective supply will also be extended.

The picture changes somewhat when growth and inventory levels are divided among the major private ownership classes. Non-industrial private owners hold 38 percent of the sawtimber inventory. These ownerships account for a similar percentage of annual sawtimber growth. Historically, these owners have harvested a much smaller percentage of the timber growth and inventory on their lands than have large industrial owners. statewide, harvests from non-industrial private ownerships have averaged only about 30 percent of annual sawtimber growth. This proportion has been higher in the northern parts of the state and lower in the central and southern Sierra. With increasing urbanization there is also the likelihood that the harvest rates on non-industrial private ownerships may decline in the future.

Industrial owners hold 62 percent of the private sawtimber inventory. In contrast to non-industrial private ownerships, harvest rates on industrial ownerships are 23 percent higher than annual growth. This means that without significant increases in growth, inventory depletion could lead to declining harvest levels in the next century. However, timber growth and inventory are sufficient to maintain harvests during the 10-15 year life of the Forest Plans.

#### The Outlook for Timber Supplies - Imports

As discussed above, the Pacific Northwest is the primary source of imported timber products in California. Displacement effects in national markets, Canada and the South also play a major role in determining the supply of timber products from the Northwest that is available to California markets.

According to studies conducted by Forest Service research units, timber supplies from the South are likely to increase, but at a slower rate than experienced over the last 20 years during the life of the Forest Plans. A

decline or falldown in supplies from the South is in prospect for the next century if there is no increase in investment and timber growth.

Studies conducted in Canada indicate that sawtimber growth and inventory is not expected to restrain exports to the U.S. until after the turn of the century. However, recent tariff and trade negotiations are expected to moderate Canadian exports to the U.S. over the near term.

A decline in timber harvests in the Pacific Northwest over the next 10-15 years is expected. This is due to reduced availability of timber inventories on both public and private lands.

The overall outlook is that imports will continue to grow to support increased demands by California consumers over the next 10-15 years. However, imports will likely increase at a lower rate than over the last 20 years and may decrease in availability beyond the year 2000.

### The Outlook for Timber Supplies - National Forests

The Allowable Sale Quantities set in individual Draft Forest Plans are an indicator of future timber supply levels from National Forests in California. The Allowable Sale Quantity places an upper limit on the average annual amount of green sawtimber from suitable timberlands that can be sold from a National Forest in the first ten-year period of the Plan. Non-chargeable timber (dead timber and fuelwood from either suitable or unsuitable timberlands) is in addition to the Allowable Sale Quantity. The addition of non-chargeable volume usually increases the total amount sold by a few percentage points.

The amount of timber offered for sale in an individual year is determined through the budget process. When the amount of timber sold in an individual year is less than the Allowable Sale Quantity, sales in future years may be higher than the Allowable Sale Quantity, since the ASQ is a limit on the average annual amount that can be sold over a ten year period.

Total planned timber sales programmed in the individual Draft National Forest Plans in Region 5 is 1.85 billion board feet annually. This is slightly above the average annual volume sold and above the 1.6 billion board foot average annual volume harvested over the past decade. Excluding the period of severe economic recession that occurred in the early 1980s, timber output under the Plans is equal to the 1.85 billion board foot average annual harvest during the decade of the 1970s. Output under the Plans is slightly above the 1985 RPA "high bound" program sale offering goal of 1.8 billion board feet for the year 1990.

### The Subregional Outlook - Overview

The picture is somewhat different when observed at the subregional level. Based on the historical pattern of log flows to mills, the state can be divided into six timber market areas: North Coast, Northern Interior, Sacramento, San Joaquin, Central Coast, and Southern California. National Forests play a significant role in the North Coast, Northern Interior, Sacramento, and San Joaquin areas.

Virtually all of the decline in the state's timber harvest that has occurred over the last 30 years has taken place in the North Coast market area on private lands. The outlook now is for relatively stable output from private lands over the 10-15 year life of the Forest Plans in all major market areas.

The relative contribution of National Forests to the timber supply differs markedly between market areas. In the North Coast area where the private timber supply has been falling most rapidly, National Forests supply only 13% of the timber. In the Northern Interior and Sacramento areas, National Forests supply 50% of the timber. In the San Joaquin area they supply 70%.

Timber outputs under the Forest Plans are lower than average annual sale levels over the last eight years in the Northern Interior area and higher in all other areas. This means that adverse impacts on local economies resulting from the Plans will be centered in Northeastern California.

Timber from the Inyo National Forest has historically been trucked to mills in the Northern Interior and San Joaquin timber supply areas. A more detailed description of those areas follows.

#### The Subregional Outlook in the Northern Interior Timber Supply Area

Timber harvests in the Northern Interior area over the past eight years have averaged 1.04 billion board feet annually. Harvests from National Forests account for 50 percent of the total volume harvested. The Klamath, Modoc, Lassen, Plumas, Shasta-Trinity, and Mendocino are the major National Forest suppliers in the area. Small volumes from other Forests have also been milled in the area (Six Rivers, Eldorado, Inyo, etc). Timber outputs under the Forest Plans are below average sale levels during the last eight years by about 15 million board feet.

Private harvests in the area have averaged 520 million board feet annually over the past eight years. This is slightly less than annual sawtimber growth on private lands of 563 million board feet annually. Private sawtimber inventory is 18 billion board feet. This is the equivalent of a 35-year supply (not counting growth) at recent harvest rates. Harvests on industrial lands may increase slightly because of recent ownership changes.

There are 22 sawmills with a combined 8-hour shift capacity of 2.5 million board feet in the Northern Interior area. This means that mill capacity is somewhat above the available sawtimber supply on an annual basis.

#### The Subregional Outlook in the San Joaquin Timber Supply Area

Timber harvests in the San Joaquin area over the past eight years have averaged 407 million board feet annually. Harvests from National Forests account for 70 percent of the total volume harvested. The Stanislaus, Sierra, and Sequoia are the dominant National Forest suppliers, but volume from the Eldorado, Inyo, and San Bernardino is also milled in this market area. Timber outputs under the Forest Plans are above average sale levels during the last eight years by about 25 million board feet.

Private harvests in the area have averaged 131 million board feet annually over the past eight years. This is less than annual sawtimber growth on

private lands of 145 million board feet annually. Private sawtimber inventory is 5.8 billion board feet. This is the equivalent of a 44-year supply (not counting growth) at recent harvest rates. Harvests on private lands are expected to be maintained near present levels during the 10-15 year life of the Forest Plans.

There are 14 sawmills with a combined 8-hour shift capacity of 1.8 million board feet in the San Joaquin area. This means that mill capacity is over 60 percent above the available sawtimber supply on an annual basis.

Timber from the Inyo National Forest makes up less than 1 percent of the supply available to mills in the San Joaquin and Northern Interior market areas. However, because this timber is available for winter logging, it serves a unique role in the timber economy. Individual timber purchasers are able to keep logging crews employed during the winter months because of the Inyo's contribution to the timber supply. The relatively high prices received for timber sold from the Inyo is an indicator of the importance of its timber to individual purchasers and their employees.

Table 1.  
California Timber Harvests by Ownership, 1952-86  
(billion board feet)

Year	Private	Other Public	National Forest	Total
1952	4.40	.05	.61	5.06
1953	5.32	.04	.63	5.99
1954	4.79	.05	.76	5.60
1955	4.93	.06	1.03	6.02
1956	4.69	.08	1.09	5.86
1957	4.36	.07	.92	5.35
1958	4.47	.09	1.11	5.67
1959	4.29	.12	1.48	5.89
1960	3.70	.11	1.33	5.14
1961	3.85	.11	1.38	5.34
1962	4.05	.11	1.38	5.54
1963	3.69	.11	1.66	5.46
1964	3.50	.11	1.86	5.47
1965	3.21	.14	1.92	5.27
1966	2.97	.11	1.93	5.01
1967	3.06	.11	1.89	5.06
1968	2.82	.16	2.36	5.34
1969	2.88	.12	2.00	5.00
1970	2.62	.10	1.84	4.57
1971	2.59	.13	2.06	4.78
1972	2.66	.12	2.22	5.00
1973	2.81	.10	2.01	4.92
1974	2.86	.11	1.73	4.70
1975	2.71	.10	1.52	4.33
1976	2.76	.08	1.89	4.73
1977	2.96	.09	1.74	4.79
1978	2.78	.08	1.80	4.66
1979	2.26	.09	1.73	4.08
1980	1.86	.07	1.51	3.44
1981	1.72	.04	1.09	2.86
1982	1.50	.06	.94	2.50
1983	1.89	.08	1.68	3.65
1984	2.09	.03	1.56	3.68
1985	2.17	.06	1.82	4.05
1986			1.96	

Sources: California Department of Forestry and Fire Protection  
California State Board of Equalization  
Bureau of Indian Affairs, USDI  
Bureau of Land Management, USDI  
Forest Service, USDA

**Table 2.**  
**Timber Harvest, Growth, and Inventory on Private Land in California**

Area	Average Annual Harvest, MMBF 1978-1985	Net Annual Sawtimber Growth MMBF, 1982-1984	Sawtimber Inventory BBF, 1982-1984
North Coast	949	981	34.9
Northern Interior	520	563	18.0
Sacramento	415	502	20.7
San Joaquin	131	145	5.8
Other Areas	22	141	7.4
All Private Land	2037	2332	86.8
Industrial Private	1785	1458	53.8
Non-industrial Private	252	874	33.0

Source: Harvest data from California State Board of Equalization and forest inventory data from Pacific Northwest Forest and Range Experiment Station, Forest Service, USDA as compiled by the California Department of Forestry and Fire Protection-Forest and Rangeland Resources Assessment Unit.

**Table 3.**  
**Average Annual National Forest Timber Sales Compared to**  
**Allowable Sale Quantities in Draft Forest Plans**

Timber Supply Area	National Forest	1979-86 Average Volume Sold, MMBF	Forest Plan Allowable Sale Quantity MMBF
North Coast	Six Rivers	150.0	175.0
Northern Interior	Klamath (1)	223.6	198.0
	Modoc	59.5	52.0
	Lassen	174.7	154.0
	Shasta-Trinity	215.7	226.0
Sacramento	Mendocino (2)	80.7	93.0
	Plumas (3)	208.0	265.0
	Tahoe	141.7	178.7
	Eldorado (4)	146.7	138.0
San Joaquin	Stanislaus (5)	117.4	134.0
	Sierra	128.4	125.0
	Sequoia	77.2	97.0
	Inyo (6)	12.8	10.0
	San Bernardino	8.8	5.2
So. Calif.	Los Padres	1.3	3.8
	R5 Total	1,747	1,855

(1) Typically 100-130 MMBF of logs flow into Oregon. Most of this amount is from the Klamath National Forest.

(2) Mendocino logs typically flow 40 percent to the Sacramento area, 40 percent to the Northern Interior area, and 20 percent to the North Coast.

(3) Plumas logs typically flow 40 percent to the Northern Interior area, 60 percent to the Sacramento area.

(4) Eldorado logs typically flow 60 percent to the Sacramento area and 40 percent to the San Joaquin area.

(5) Stanislaus logs typically flow 20 percent to the Sacramento area and 80 percent to the San Joaquin area.

(6) Inyo logs typically flow 50 percent to the San Joaquin area and 50 percent to the Northern Interior area.

## REFERENCES

Hiserote, Bruce A., and James O. Howard, California's Forest Industry, 1976, USDA Forest Service, Pacific Northwest Forest and Range Experiment Station, 1978.

Howard, James O., California's Forest Product Industry: 1982, USDA Forest Service, Pacific Northwest Forest and Range Experiment Station, 1984.

Ruderman, Florence K., and Debra Warren, Production, Prices, Employment and Trade in Northwest Forest Industries, USDA Forest Service, Pacific Northwest Forest and Range Experiment Station, quarterly.

USDA Forest Service, America's Renewable Resources: A Supplement to the 1979 Assessment of the Forest and Range Land Situation in the United States, February 1984.

USDA Forest Service, An Analysis of the Timber Situation in the United States 1952-2030, December 1982.

USDA Forest Service, An Assessment of the Forest and Range Land Situation in the United States, January 1980.

USDA Forest Service, Regional Guide for the Pacific Southwest Region, August 1984.

USDA Forest Service, The South's Fourth Forest, Alternatives for the Future, (review draft), 1986.