TIMBER RESOURCES and INDUSTRIES in the ROCKY MOUNTAIN STATES

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TIMBER RESOURCES AND INDUSTRIES IN THE ROCKY MOUNTAIN STATES

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FOREWORD

This report presents the most complete set of statistics on timber inventory, cut, and timber products output that has ever been prepared for the Rocky Mountain States[1] as a whole. Some of the material has already been published in reports for individual States or portions of States. This report discusses past trends in timber industries and the importance of timber industries in the economy of the Mountain States, but does not attempt to project or analyze the data in terms of possible future developments. However, this report does provide much of the basic resource and timber industry data necessary for anyone looking into future possibilities. The Bibliography, page 50, contains a listing of the most recent and pertinent literature concerning the problems of and opportunities for timber-oriented industrial developments in the Rocky Mountains.

Most of the inventory statistics shown here agree with those shown in "Timber Trends in the United States" (71),[2] except those for Arizona and New Mexico. Statistics for these States in the Timber Trends report are based on incomplete inventories, whereas those shown in this report result from surveys completed in 1962. However, because compilations were not finished until late 1964, these later data for Arizona were not available for the Timber Trends report. Moreover, some information shown in the industries map and presented in the text relating to pulpmill and plywood plant locations and capacities is more recent than the data shown in the tables.

Statistics from many sources have been used in compiling this report. Inventory data result from surveys made by the 59 National Forests in the Rocky Mountain States, the Intermountain Forest and Range Experiment Station, the Rocky Mountain Forest and Range Experiment Station, and the Bureau of Indian Affairs. Surveys of timber cut and timber products output were made cooperatively by the Intermountain and Rocky Mountain Forest and Range Experiment Stations. Estimates of lumber production are based on surveys by U.S. Bureau of Census.

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[1] The following are called Rocky Mountain or Mountain States in this report: Idaho, Montana, South Dakota (west of the 103d meridian), Wyoming, Colorado, Utah, Nevada, Arizona, and New Mexico.

[2] Underlined numbers in parentheses refer to publications listed in the Bibliography, page 50.

CONTENTS

TABLES

ROCKY MOUNTAIN TIMBER AS PART OF THE NATION'S SUPPLY

This section of the report considers the timber resources of the Mountain States in comparison with those of other major sections of the United States and of the entire United States as of the beginning of 1963. Recent trends in types and capacities of timber-based industrial establishments in the Mountain States are compared with trends elsewhere in the Nation.

FOREST LANDS AND TIMBER

Under this heading, the timber resources of the Mountain section are examined and compared with those of other sections of the country in regard to forest land areas, timber volumes, land and timber ownerships, timber stand-size classes and types, and rates of timber growth and cut.

Land Areas

The Mountain section contains nearly one-fourth (24 percent) of the gross land area of the United States (fig. 1). In this respect it is roughly comparable to each of the other three main sections of the country--the North, the South, and the Pacific Coast--as recognized in this report

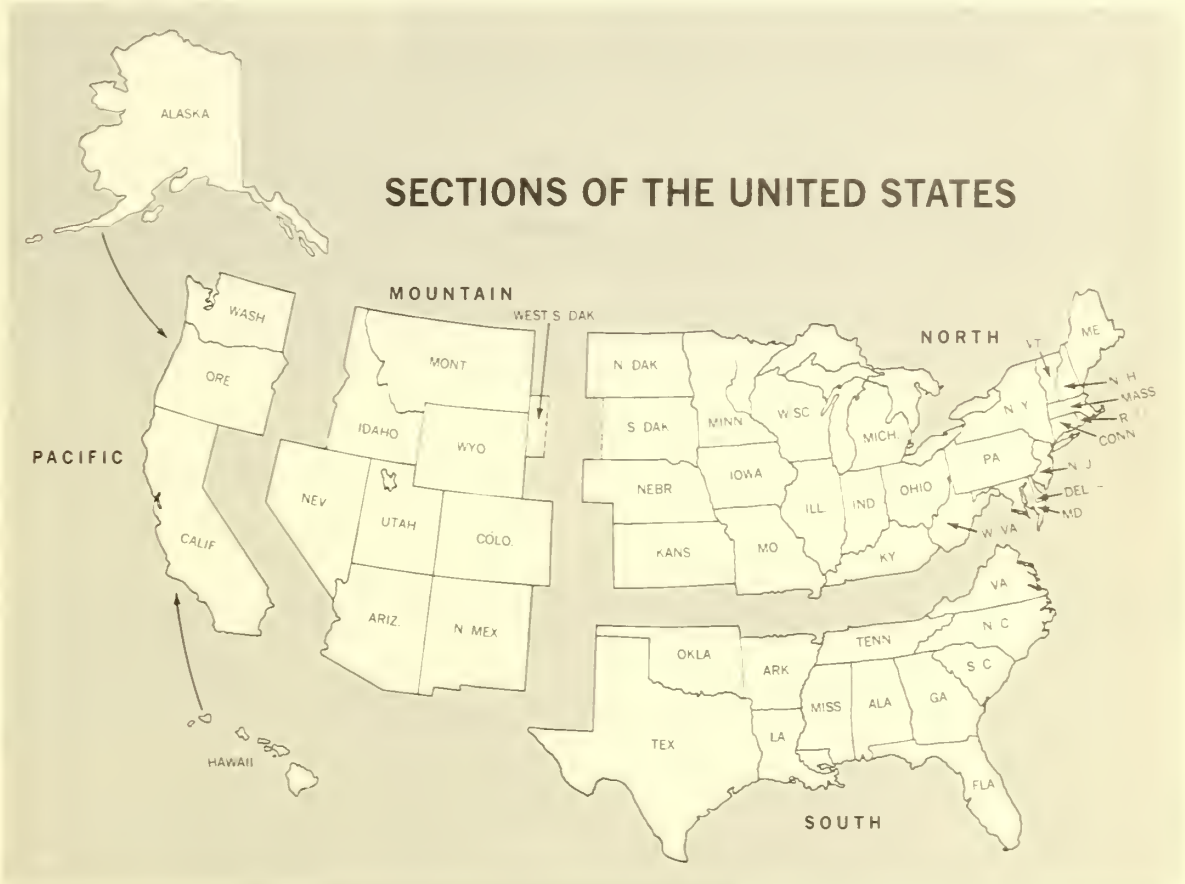


Figure 1

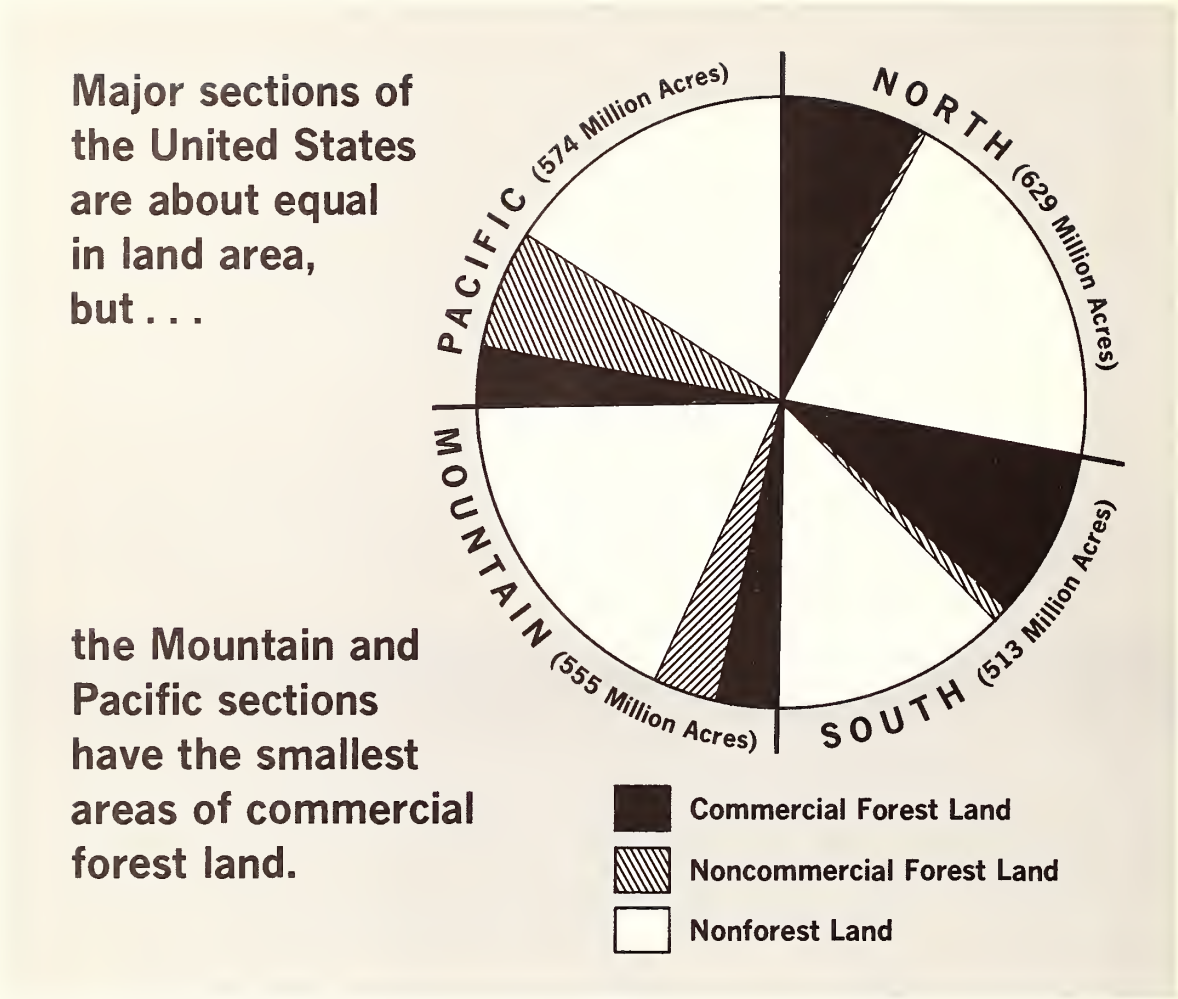


Figure 2

and in the "Timber Trends in the United States" (71). In total forest land the Mountain section falls somewhat behind the other sections of the country, as the following tabulation shows:

Section	Forest land (Million acres)
North	179
South	220
Mountain	143
Pacific	217
Total	759

Mountain and Pacific Coast sections about equal in commercial forest area

The Mountain section includes some of the widest environmental extremes for plant life to be found anywhere on the continent. Therefore, it is not surprising that only 26 percent of the land area in the Mountain section is forested. This is the lowest percentage of all four sections of the country. Although the Mountain States have less forest land, they have nearly as much commercial forest land (66 million acres) as the Pacific Coast States (70 million acres),[3] as shown in figure 2.

More than half of Mountain States forest land not commercially important for timber

The "noncommercial" forest land classification includes lands that fall under one of two subclasses. Nearly 7.4 million acres (5 percent) of the forest land in the Mountain States--more than in any other section--are "productive-reserved." This means they are in parks and other areas where commercial timber operations are prohibited. Nearly 70 million acres (49 percent) of the Mountain States forest land are unsuited for commercial timber operations and are termed "unproductive."

Public ownership of commercial forest land highest in Mountain States

The contrast between the proportions of commercial forest land in public ownership in the United States as a whole and that in the Mountain States is striking. Only 28 percent of the commercial forest land of the United States is publicly owned, but in the Mountain States 77 percent is in this category. Nearly two-thirds (66 percent) of the commercial forest land in the Mountain States is in National Forests. Conversely, the Mountain States have the least acreage of commercial forest land in private ownership of any major section of the country (table 1).

Table 1.--Ownership of commercial forest land

Section	Federal		Other public	Private
	National Forests	Other		
	Million acres			
North	10	2	20	140
South	11	3	3	184
Mountain	43	5	2	15
Pacific	33	6	4	28
Total	97	16	29	367

Softwood forest types characterize commercial forest in West

Softwood forest types are predominant in the commercial forests of both the Mountain and Pacific sections. The commercial forests of the Mountain States have nearly 60 million acres of softwood types (91 percent of the commercial area), and the Pacific section has somewhat more (65 million acres, or 93 percent). The South has a greater area in softwood types (81 million acres) than either the Mountain or Pacific sections, but it has a still greater area in hardwoods (120 million acres). Consequently, the commercial forest land of this section is more characteristically hardwood than softwood (fig. 3).

[3] Includes commercial forest land area for coastal Alaska only. Some parts of the forest land of interior Alaska are expected to meet standards for commercial forest land, but data are not yet available.

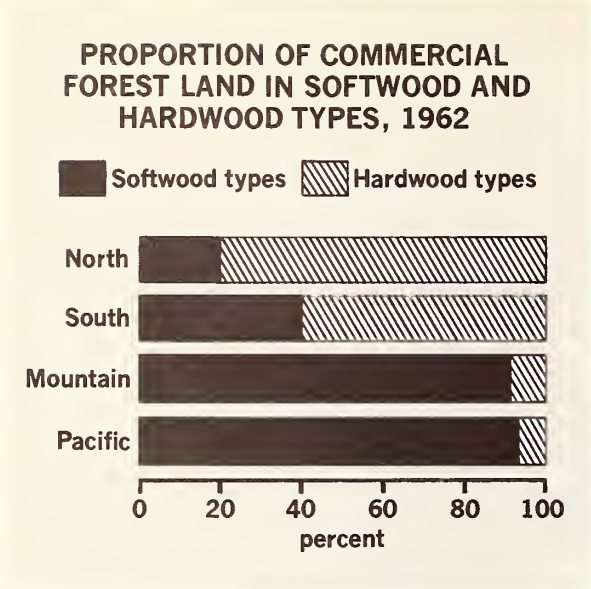


Figure 3

Mountain States commercial forest land largely in sawtimber stands

Nearly 60 percent of the Mountain States commercial forest land is in sawtimber stands; the proportion (69 percent) is even higher in the Pacific States (fig. 4). Since these sections include practically all of the old-growth sawtimber stands remaining in the United States, much attention has been given to finding methods for harvesting the old-growth and often highly defective timber. An integral part of the problem is making the transition to more intensive management while achieving an inventory that is better balanced than at present for continuous production at a high level.

Timber Inventories[4]

Mountain States have one-fifth of Nation's softwood sawtimber volume

With less than one-sixth of the total growing stock inventory of the United States, the Mountain States have more than one-fifth of the Nation's volume of softwood growing stock. The situation with respect to sawtimber inventories--total and softwood--is similar, as shown in table 2.

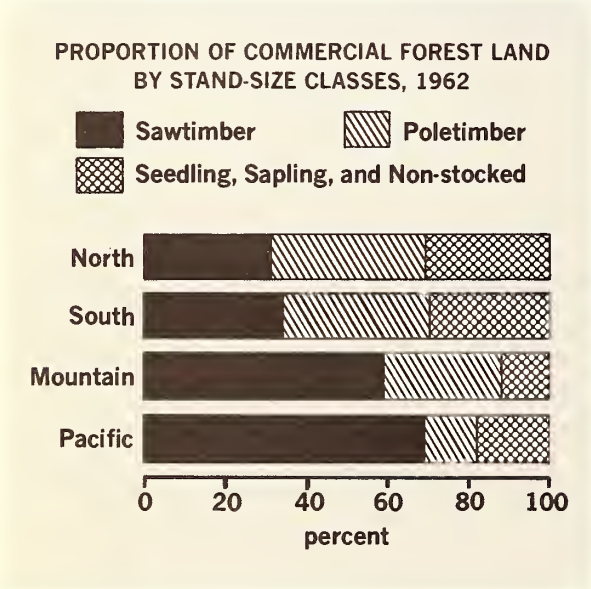


Figure 4

[4]Throughout this report volumes of growing stock (sound, live trees 5.0 inches and larger in diameter) are given in cubic feet. Volumes of sawtimber (trees 9.0 inches and larger for softwoods, 11.0 inches and larger for hardwoods) are given in board feet.

Table 2.--Proportions of United States inventories of sawtimber and growing stock, by sections, 1962

Section	All sawtimber[1]	All growing stock[2]	Softwood sawtimber[1]	Softwood growing stock[2]
	Percent			
North	12.2	21.8	3.3	7.2
South	16.3	21.4	10.9	14.5
Mountain	16.3	15.6	19.7	21.4
Pacific	55.2	41.2	66.1	56.9
United States	100.0	100.0	100.0	100.0

[1] Board-foot basis. [2] Cubic-foot basis.

Proportion of timber volume in public ownership highest in Mountain States

Of all four sections of the country, the Mountain section has the highest percentage of its total timber inventory in public ownership (83 percent), as shown in figure 5. This is largely due to the high proportion in National Forests (73 percent). Conversely, the Mountain States rank lowest in the percentage of forest inventory under private management. Consequently, future development of timber resources is largely dependent on management by public agencies.

Sawtimber trees account for 78 percent (75,788 M cubic feet) of the growing stock volume of the Mountain States. Although this percentage is higher elsewhere in the West--the average for the West is 85 percent--the Mountain States rank several points above the national average (73 percent).

One-fifth of the Nation's softwood sawtimber and 22 percent of the softwood growing stock are in the Mountain States. The principal softwoods are Douglas-fir, ponderosa pine, lodgepole pine, Engelmann spruce, and several species of true firs. Nearly two-thirds (63 percent) of all western white pine sawtimber and 71 percent of all western larch sawtimber are found in Idaho and Montana.

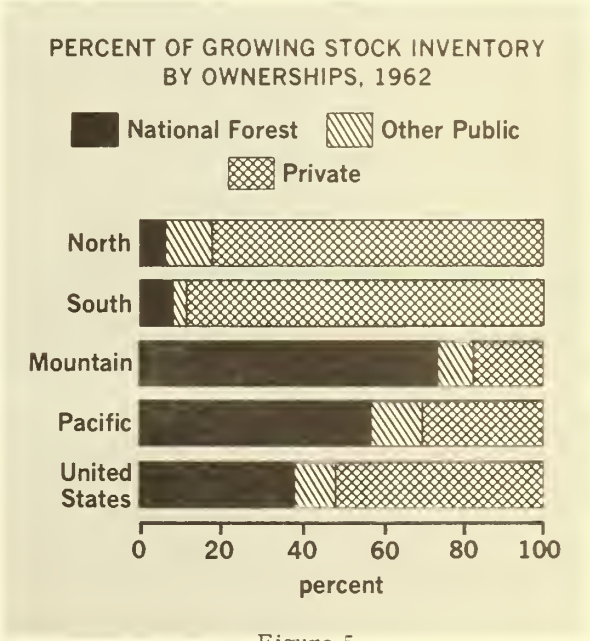


Figure 5

Sawtimber and growing stock volumes per acre relatively high in Mountain States

Sawtimber and growing stock volumes per acre in the Mountain States rank well above the national average and are exceeded only in the Pacific Coast section. The high proportion of sawtimber trees remaining in western stands is the main factor producing the higher averages shown by these two sections in the following comparison:

Section	Growing stock per acre (M cu. ft.)	Sawtimber per acre (M bd. ft.)[1]
North	0.8	1.8
South	.7	2.0
Mountain	1.5	6.3
Pacific	3.7	19.8
United States	1.2	5.0

[1] International $\frac{1}{4}$-inch log rule board-foot volumes are used throughout this report.

Growth and Cut

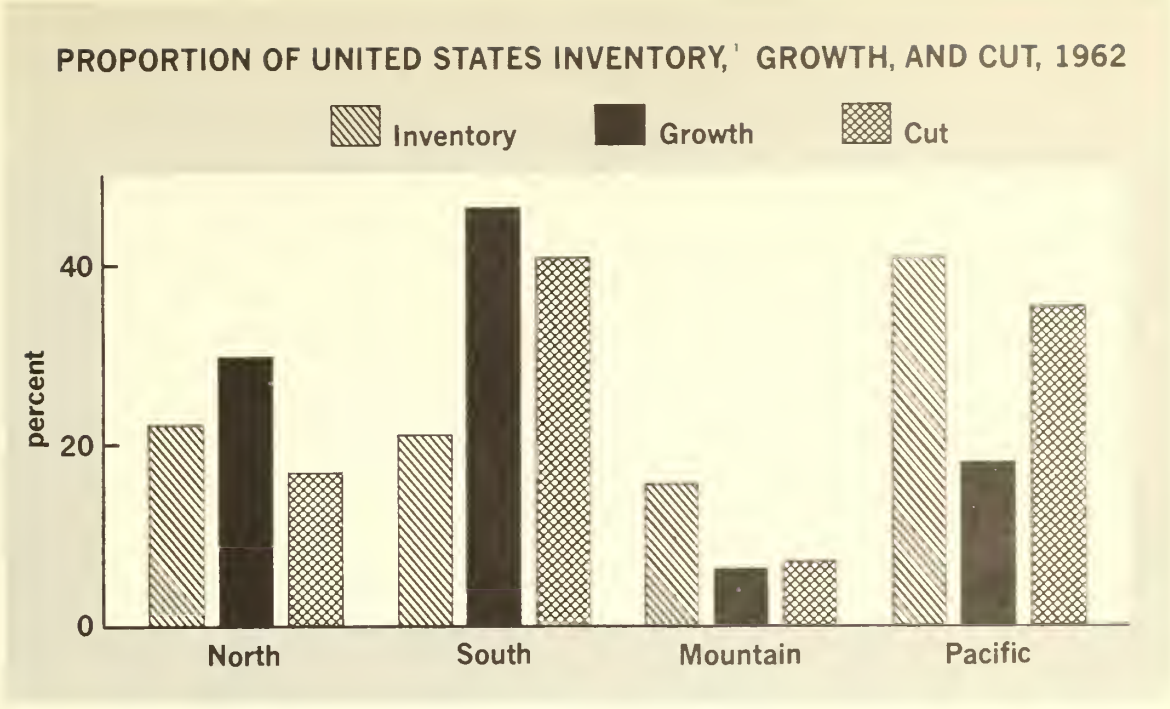
Timber cutting rate lowest in Mountain States

Both the highest and lowest percentages of the country's timber inventory are found in the western sections: the highest percentage in the Pacific section and the lowest in the Mountain section. Each of the eastern sections contributes more volume through growth than either of the western sections, while the South and Pacific sections (in that order) provide the highest percentages of the United States timber cut (fig. 7).

With an annual timber cut of not more than 1 percent of inventory, the Mountain States section has the lowest cutting rate in the country (fig. 8). This applies whether the cut is considered with respect to all sawtimber, all growing stock, softwood sawtimber, or softwood growing stock.

Timber growth rates are markedly higher in the eastern sections than in the western sections (fig. 9). Both the Mountain and Pacific States have large amounts of mature and overmature timber with low or even negative growth rates. These low rates depress overall growth rates for both growing stock and sawtimber. The eventual liquidation of much of this slow-growing timber will permit replacement by younger, more rapidly growing trees, and will bring about an increase in the general net growth rates.

Figure 6.--A clearcut block satisfactorily regenerated with western larch saplings near Trout Lake on the Flathead National Forest in Montana. Other clearcut blocks can be seen across the lake. Even though cutting rates are low in the Mountain States, some parts of these States are cutting at or near allowable annual rates.



[1] Inventory of live, sound trees 5.0 inches and larger in diameter breast high.

Figure 7

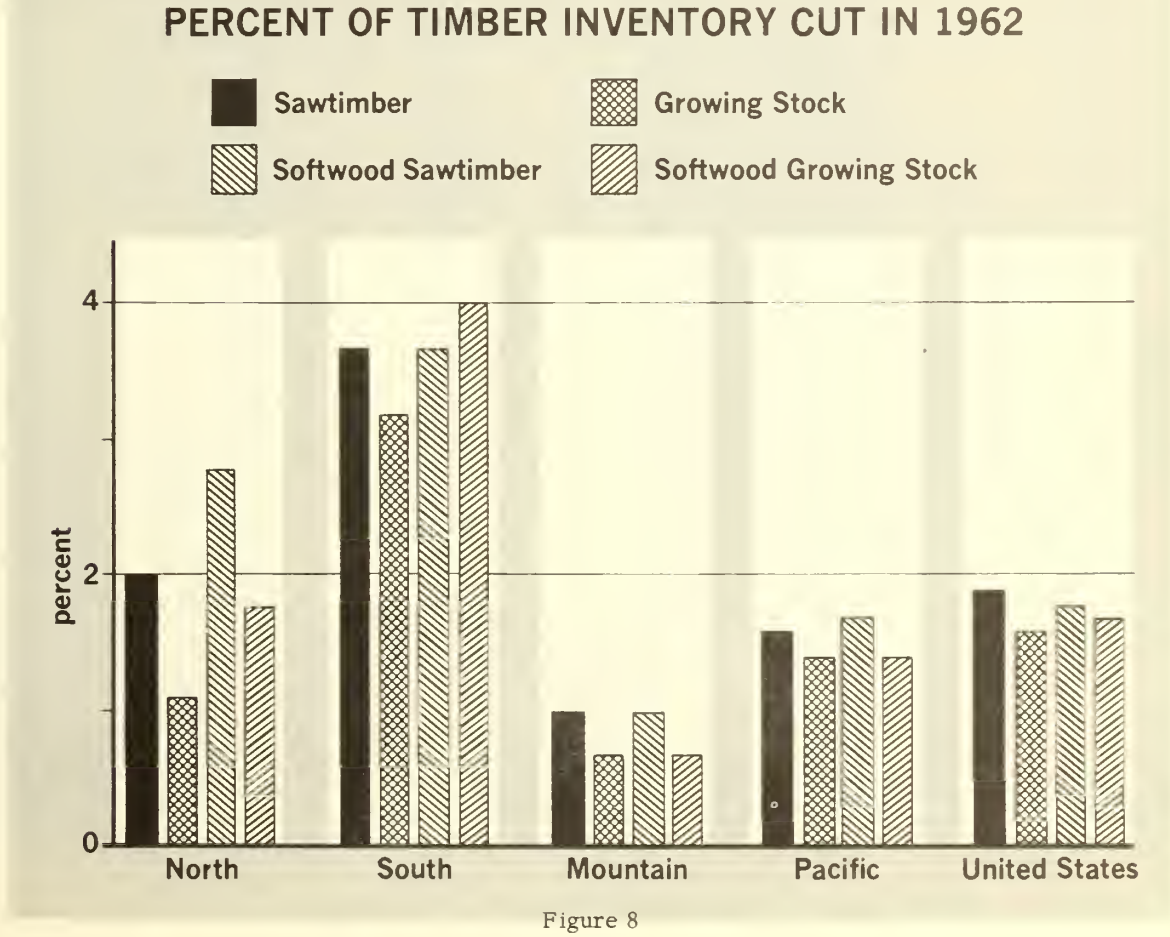


Figure 8

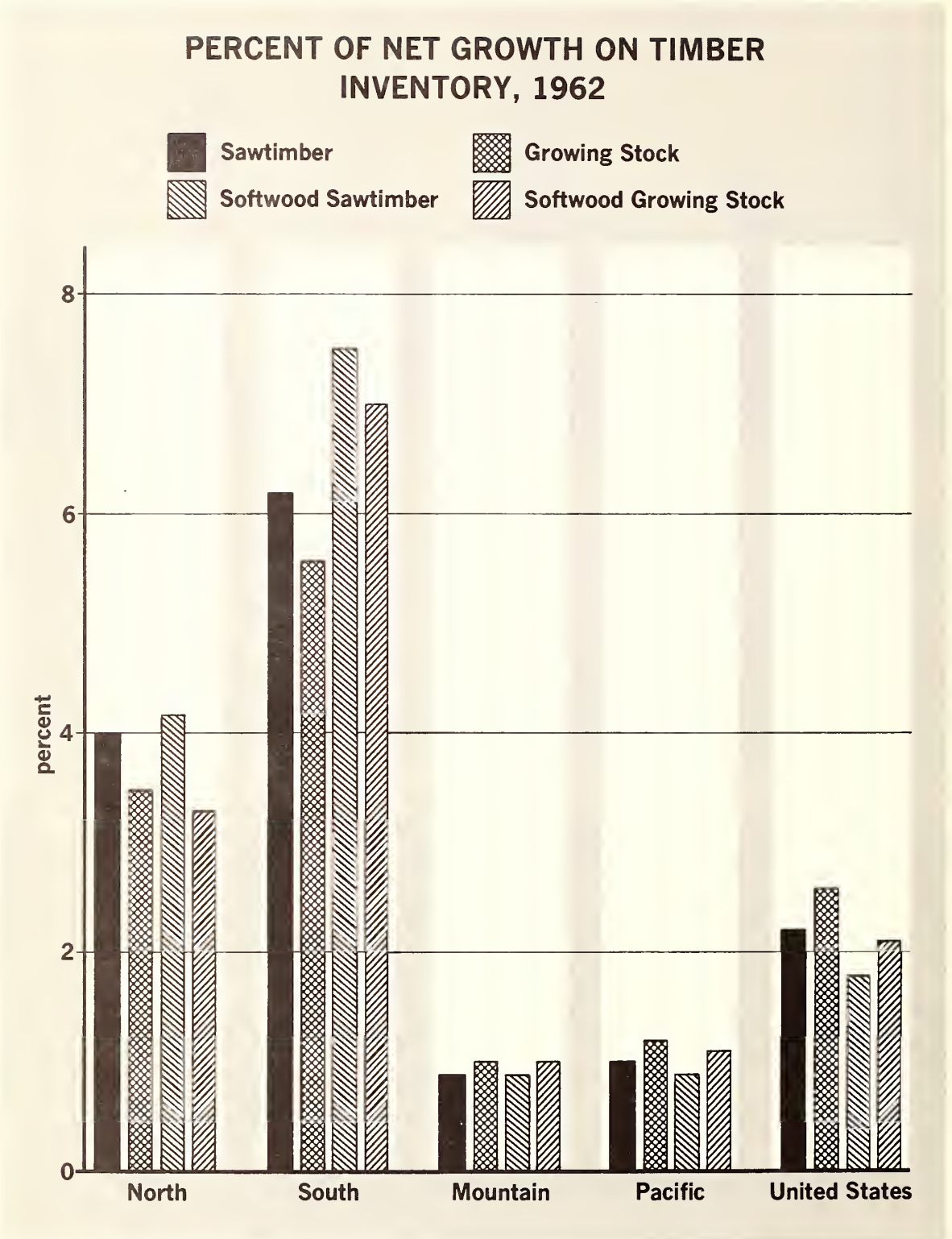

PERCENT OF NET GROWTH ON TIMBER INVENTORY, 1962
Sawtimber
Softwood Sawtimber
Growing Stock
Softwood Growing Stock
percent
8
6
4
2
0
North
South
Mountain
Pacific
United States

Figure 9

TIMBER INDUSTRIES

Comparison of the output of roundwood products in 1962 among the four major sections of the United States reemphasizes how far the Mountain States lag behind other sections in the yield of timber products. The South and Pacific sections lead the others in total roundwood production and in the production of saw logs; the Pacific section has no rival in veneer log output; the South leads in round pulpwood production; and the North and South sections lead in miscellaneous industrial wood and fuelwood (fig. 10).

Still much room for industrial development

In the Mountain States, even though timber volumes per acre are comparatively high, remoteness from principal markets and relatively high logging costs keep the cut for the area as a whole still well below the sustainable level. However, there are important exceptions to this general situation. Parts of northern Idaho and western Montana have long supported a large timber industry which was and is chiefly dependent on the sawtimber resource; they now find themselves with greater plant capacity for saw log material than can be sustained by the present sawtimber inventory under present levels of management. Saw log production in the Black Hills has been close to capacity for some time. In several other parts of the Mountain States the sawtimber cut is not far below a sustainable level. In general, however, resources suitable for other products remain untapped, particularly products such as pulpwood which can be made from trees smaller than sawtimber size. It is reasonable to expect that with a more diversified timber industry, higher total cuts could be sustained--even in areas where the cut of sawtimber is at or near the maximum that can be sustained under present management levels.

Mountain section shows strongest upward trends for all roundwood products, saw logs, and veneer logs

Comparison of some production records of the Mountain section with production records elsewhere points up some unique aspects of the position of the Mountain States in the Nation's timber economy. While the United States as a whole had a downward trend in the output of timber products from 1952 to 1962 (fig. 11), the Mountain and Pacific sections had upward trends. Of the western sections, the Mountain section showed the highest percentage increase with an output 44 percent higher in 1962 than in 1952. This is largely traceable to the fact that the Mountain section alone showed a strong increase in saw log output during this period; all other sections of the country, and the United States as a whole, showed declines in saw log output. Supporting evidence for these trends appears in Census Bureau lumber production figures. These show that from 1952 to 1964 the general lumber production trends in the North, South, and Pacific sections were downward while the Mountain section exhibited an upward trend (fig. 12).

Several explanations can be advanced for the unique rising trend in the Mountain States. Much of the difference between the Mountain States trend and those of the other sections probably arises because the Mountain States still have large inventories of sawtimber in which the allowable cut has not been reached. Here timber availability is not appreciably reduced by being tied up in large private holdings, as it is in other parts of the country.

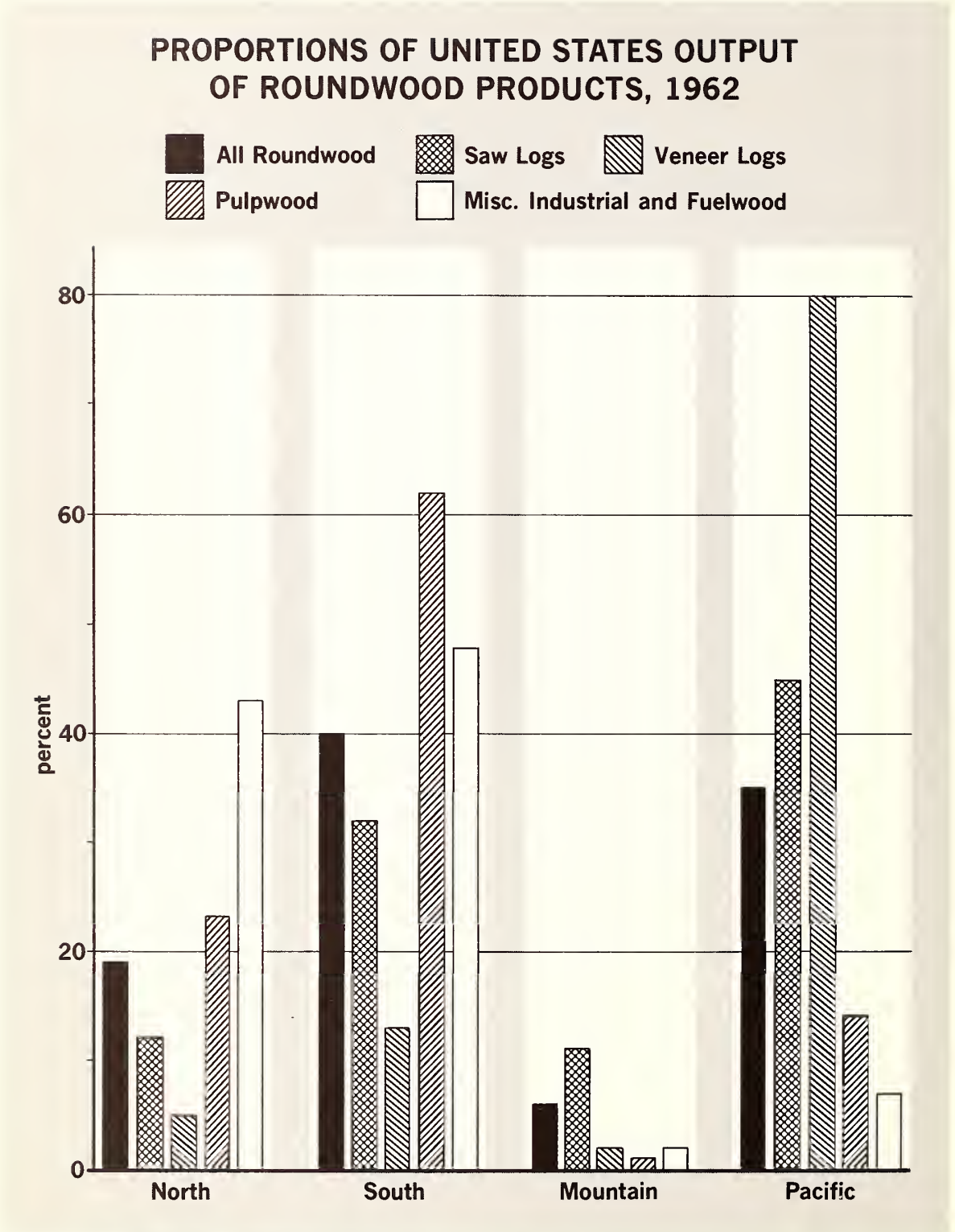

PROPORTIONS OF UNITED STATES OUTPUT
OF ROUNDWOOD PRODUCTS, 1962
All Roundwood
Saw Logs
Veneer Logs
Pulpwood
Misc. Industrial and Fuelwood
percent
80
60
40
20
0
North
South
Mountain
Pacific

Figure 10

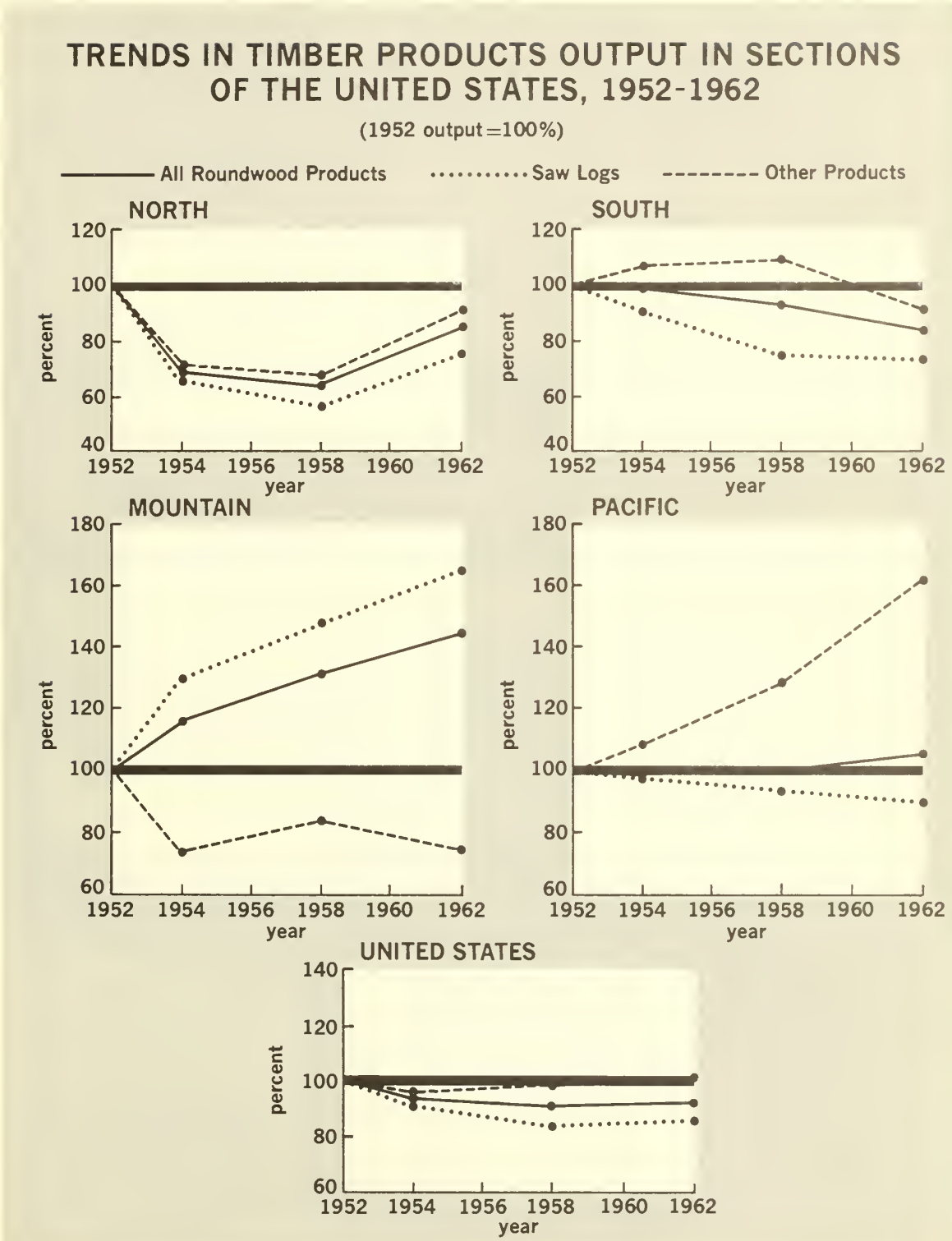

TRENDS IN TIMBER PRODUCTS OUTPUT IN SECTIONS OF THE UNITED STATES, 1952-1962
(1952 output=100%)
All Roundwood Products
Saw Logs
Other Products
NORTH
SOUTH
MOUNTAIN
PACIFIC
UNITED STATES
percent
year
120
100
80
60
40
180
160
140
1952
1954
1956
1958
1960
1962

Figure 11

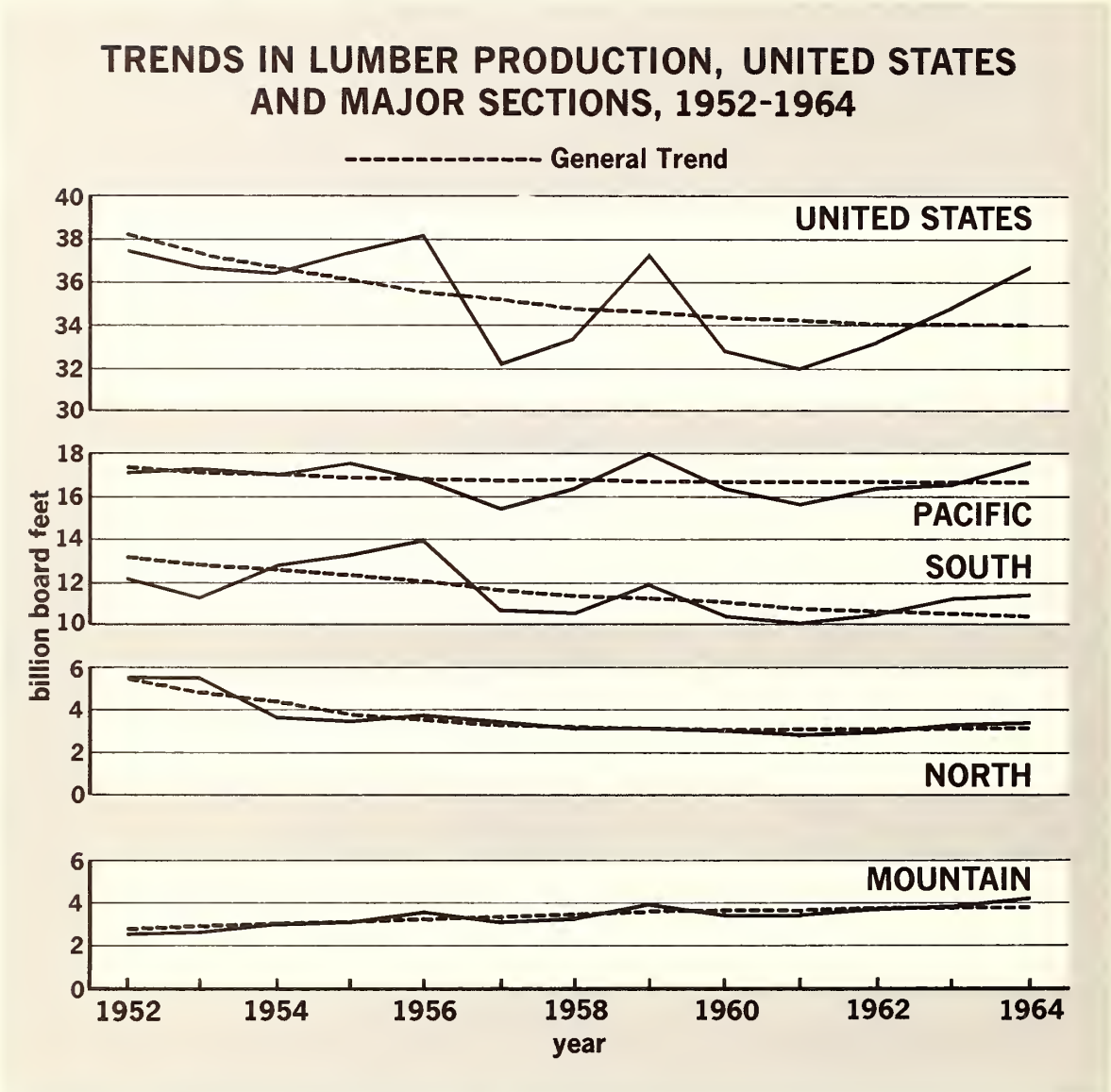


Figure 12

The continued upward trend for lumber (particularly dimension stock) in the Mountain States may also have been prompted by a need to make up, in part, a supply deficit created by temporary downward trends[5] in other parts of the country. Producers in the Mountain States could logically be expected to step in if such a situation arose, since they have always had to seek markets outside their area. Even though the Mountain States' timber industries

[5] That the trends are temporary appears to be confirmed by the upswing in lumber production in all sections of the country starting in 1961.

are still strongly oriented toward lumber production, increasing amounts of wood have been and are being consumed in producing softwood plywood and pulp. However, there is still only one particle board plant in the Mountain States.

Although the outputs of plywood and pulp in the Mountain States have been and are relatively small parts of the national production, the rapid developments in these industries over a comparatively short period indicate the possible rate of industrial expansion in the Rockies in the near future.

As measured by the rate of increase in softwood plywood production between 1952 and 1964, the Mountain section has made remarkable gains in the output of veneer logs. This is borne out by the fact that the production of plywood in the Mountain States was 24 times larger in 1964 than in 1952. United States plywood output in 1964 was just under four times the 1952 figure.

1962 pulp production eight times that of 1952

Pulp production and pulpmill capacities have expanded greatly in the Mountain States since 1952. Wood pulp production in 1962 was eight times as great as that in 1952, and by 1965 the installed pulpmill capacity was nine times the 1952 capacity. However, there was no marked rise in the production of round pulpwood from 1952 to 1962, as practically all of the increase in pulpmill capacity and pulp production came from the growth in use of chips from sawmill residues.

Figure 13.--Loading a logging truck on a timber sale in the Coconino National Forest near Happy Jack, Arizona. Saw log output in the Mountain section increased more rapidly between 1952 and 1962 than for any other section of the country.

RELATIONSHIPS WITHIN THE ROCKY MOUNTAIN AREA

This section examines timber resources and industries in individual Rocky Mountain States and attempts to point out important comparisons between States.

THE TIMBER RESOURCE

The distribution and characteristics of the timber resource vary widely over the Rocky Mountain area because of the variety of environmental conditions. (See the map at the end of this report showing commercial forest land in the Rocky Mountain States.) The following discussion describes this forest in terms of area, timber volumes, growth, and cut.

Land Areas

Together, Montana and Idaho contain one-half the commercial forest land in Rocky Mountain States

The northern Rocky Mountain States[6] dominate much of the Rocky Mountain timber situation. And in the northern Rockies, Idaho and Montana stand out prominently. Over 70 percent of the forest land in the northern Rocky Mountain States is commercially important. By comparison, only 30 percent of forests in the southern Rockies is commercial. Montana has more area of commercial forest land (17.3 million acres) than any other Mountain State. If Idaho's 15.8 million acres of commercial forests--the second largest area in the Rockies--are added to Montana's, the total (33.1 million acres) amounts to 50 percent of the commercial forest land in the Rocky Mountain States (fig. 14). Colorado ranks third in commercial forest area with 12.3 million acres--19 percent of the Rocky Mountain total. Nevada, with only 0.2 percent of the Mountain States total, has the smallest area of commercial forests in the Mountain States. Although Montana has the largest share of commercial forest in the Rockies, Idaho has the largest proportion of its total land area in commercial forest land. Thirty percent of Idaho's land grows commercial forests. Western South Dakota, Montana, and Colorado follow, each having 19 percent of its total land in commercial forests. Nevada, with its vast area of rangeland and unproductive forests, is again lowest in the United States; only 0.2 percent of its total land area is in commercial forest.

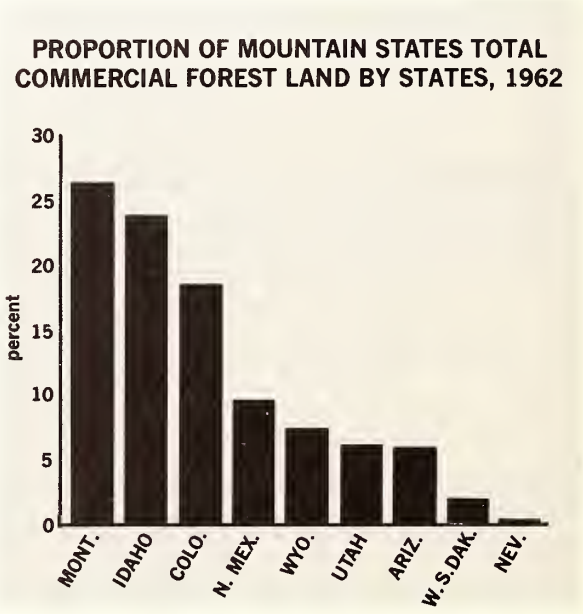


Figure 14

[6] In this report the northern Rocky Mountain States consist of Idaho, Montana, western South Dakota (the portion of the State west of the 103d meridian), and Wyoming. The southern Rocky Mountain States include Arizona, Colorado, Nevada, New Mexico, and Utah.

Southern Rocky Mountain States have highest proportion of noncommercial forest land

Noncommercial forest land is divided into two general categories--unproductive land and productive land that is reserved from timber harvesting. In the Rocky Mountain States there are 70.0 million acres of unproductive forest land and 7.4 million acres of productive-reserved forest land.

Eighty-five percent of the unproductive forest area is in southern Mountain States. Arizona has more unproductive forest (16.3 million acres) than any other Mountain State. Most of this unproductive land consists of 12.2 million acres of pinyon-juniper type, more than is found in any other Mountain State.

The greater part of the area in productive-reserved forests is in the northern Mountain States. Of the 7.4 million acres of this land class in the Rockies, Wyoming has 2.6 million acres--more than any other Mountain State.

Nearly three-fourths of commercial forest land is federally managed

The Federal Government administers 48.4 million acres[7] of the 65.9 million acres of commercial forest land in the Rocky Mountains. Arizona, with 95 percent of its commercial forest land in Federal management, is second only to Alaska in this respect. Idaho and Montana have the largest areas of Federal commercial forests in the Mountain States, with 11.8 million acres each. Together these two States comprise nearly one-half of the total area of the Mountain States in this ownership class. Most (90 percent) of the federally managed commercial forest in the Rockies is in National Forests.

The States own 4 percent of the commercial forest land in the Rockies. The largest area of State-owned commercial forest is in Idaho, where there are 940,000 acres in this category. Together, Idaho and Montana account for two-thirds of the State-owned commercial forest land in the Mountain States.

Twenty-three percent of the commercial forest in the Mountain States is privately owned. Most of this land is in three States--Montana, Colorado, and Idaho. The largest area is in Montana where 4.9 million acres are in private ownership; more than 1 million acres of this are owned by forest industries. The only other Mountain State having a large area of industry-owned commercial forest is Idaho where there are 1.2 million acres of such land.

Unlike any other Mountain State, Nevada has the bulk (71 percent) of its commercial forests in private ownership.

[7] Although the Federal Government administers this land, it is not all federally owned. Indian lands, which account for 2.8 million acres of commercial forest, are under Federal trusteeship and are managed by the Bureau of Indian Affairs even though the land is private in many respects.

Sawtimber stands dominate the commercial forest

Fifty-nine percent of the commercial forest land in the Rockies supports sawtimber stands. A slightly higher proportion of sawtimber area is found in the southern Rocky Mountain States than in the northern. In particular, the Southwest[8] has the highest proportion in the Rockies. In Arizona 94 percent of the commercial forest is occupied by sawtimber stands--a higher proportion than that of any other State in the country. However, among the Rocky Mountain States, those with the largest areas of sawtimber stands are Idaho (8.7 million acres) and Montana (8.3 million acres). Despite this large area in Montana, sawtimber stands in that State represent only 48 percent of its commercial forest land--the smallest proportion of any of the Mountain States.

The imbalance of sawtimber stands to other stand-size classes, as shown in figure 16, presents problems to timber managers in the Rockies. Many sawtimber stands are over rotation age (around 120 years) and sustain high annual volume losses from insects, diseases, windthrow, and other natural causes of death. A more even distribution of age classes is desirable and should be achieved as the harvest in sawtimber stands accelerates in the Mountain States.

In Arizona and New Mexico the distribution of stand-size classes can be misleading if used to indicate the distribution of trees by age classes. The high proportions of commercial forest selectively harvested in these two States resulted in residual stands with many sawtimber trees per acre. Most of these ponderosa pine stands (the principal species in the Southwest) are classed as sawtimber because the greatest percentage of crown density is in sawtimber trees.

[8] In this report the Southwest includes Arizona and New Mexico.

Figure 15.--The seedling-sapling stand of lodgepole pine in the foreground became established after cutting on a clearcut block in Montana's Lewis and Clark National Forest. These young trees were thinned so that the stand would not stagnate like the overstocked, mature trees in the background.

However, since substantial numbers of pole size and smaller trees are characteristically present in these stands, the problem of imbalance of age classes is not as acute as it would seem.

Nearly 80 percent of all sawtimber stands in the Mountain States is publicly owned; the highest proportion is in Arizona (96 percent) and the lowest is in Nevada (22 percent).

Nearly two-thirds of the 19 million acres of poletimber stands in the Rockies are in northern Mountain States. Montana and Colorado contain the largest areas of this stand-size class. Most of Montana's poletimber stands are made up of lodgepole pine, and many of them are stagnated and over rotation age. The best management prescription for some of these stands is to remove or destroy the existing trees and to regenerate a new stand that can be managed. In Colorado, aspen predominates in poletimber stands. Three-fourths of this stand-size class in the Rocky Mountains is publicly owned. In some parts of the Mountain States the allowable annual cut of sawtimber has been approached or reached. However, few if any areas are close to harvesting the allowable cut for all growing stock trees. For this reason much of the increase in total timber cut probably will come from poletimber trees.

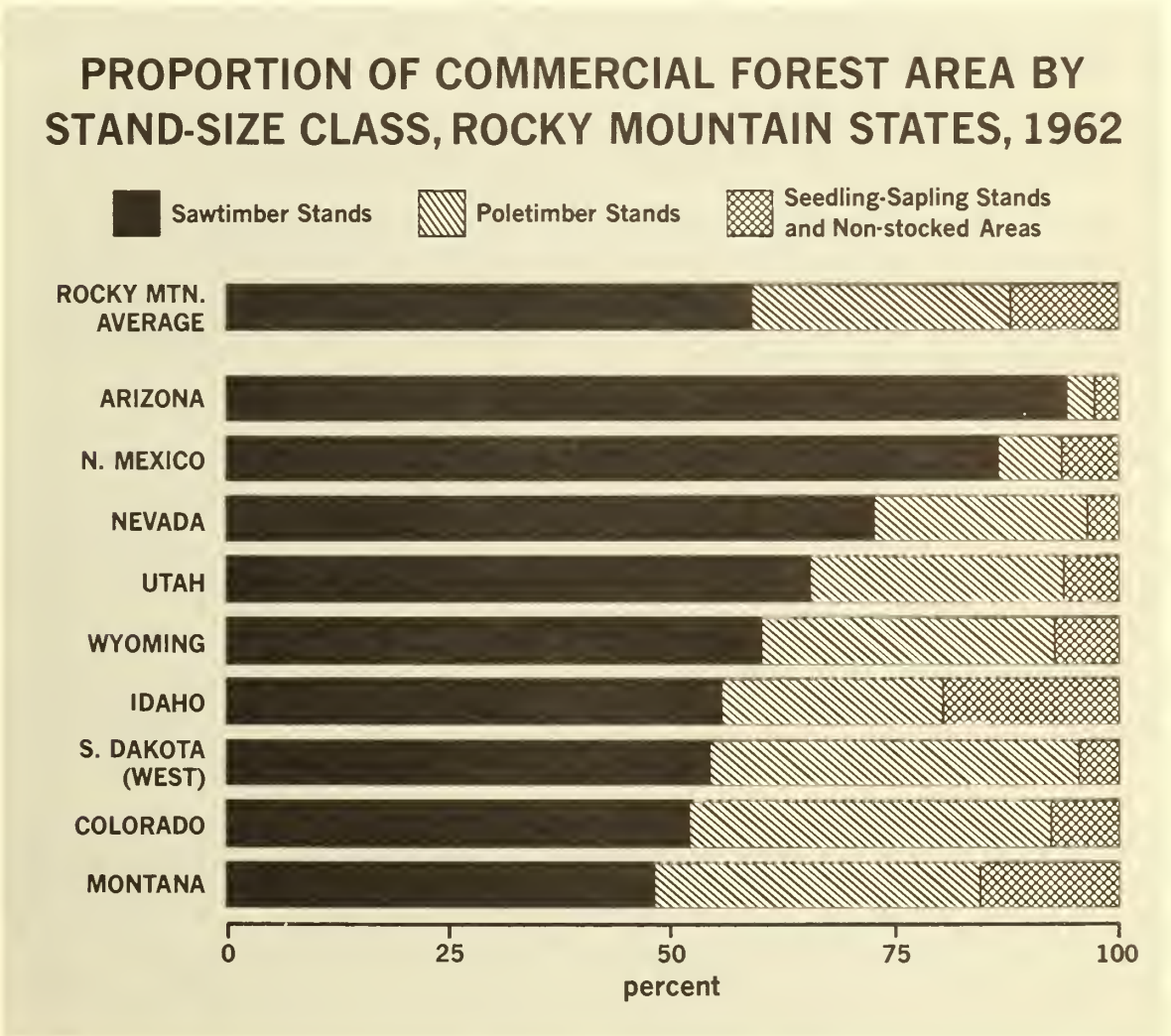


Figure 16

The area of seedling-sapling stands is small in the Rockies; it comprises only 4 million acres or 7 percent of the commercial forest land. The bulk (73 percent) of these stands is in Idaho and Montana. Seventy-five percent of the seedling-sapling stands in the Mountain States is in public ownership.

Nonstocked areas constitute only 5 percent (3.6 million acres) of the Mountain States' commercial forest area, most of which (2.7 million acres) is in Idaho and Montana. Public agencies administer 65 percent of the nonstocked commercial forest land in the Rockies, but in Colorado, Montana, and Nevada most of these lands are privately owned.

Areas of ponderosa pine and Douglas-fir types lead in the Rocky Mountains

The ponderosa pine type grows on 19.4 million acres in the Rockies and is found in every Mountain State. (Fir-spruce is the only other commercial type that is classed in every Mountain State.) This forest type constitutes 29 percent of the commercial forest area in the Mountain States, which is more than any other type. The commercial forests in western South Dakota and Arizona are especially dominated by this type. The ponderosa pine type constitutes 98 percent of the commercial forest area in western South Dakota and 92 percent in Arizona.

The 13.3 million acres classed as Douglas-fir type represent 20 percent of the Mountain States' commercial forest area. The bulk (70 percent) of this type grows in Idaho and Montana.

Lodgepole pine type grows on nearly 20 percent (12.8 million acres) of the Mountain States' commercial forest area. The northern Mountain States contain almost four-fifths of this area, most of which (5.4 million acres) is in Montana. This forest type accounts for 31 percent of Montana's commercial forest area. No areas are classed as lodgepole pine type in western South Dakota or in the Southwest.

The fir-spruce type ranks fourth largest in the Rockies, growing on 8.9 million acres. Somewhat more of this type is found in the southern than in the northern Mountain States. Colorado contains the largest share of this type with 3.4 million acres.

The larch type, which accounts for only 4 percent of the Mountain States' commercial forest area, is found only in western Montana and northern Idaho. Its total area is 2.7 million acres, and 1.9 million acres of this is in Montana.

The white pine type grows on 2.4 million acres in the Rocky Mountains. The principal concentration of this type is in northern Idaho, although it extends into western Montana and slightly into western Nevada.

Colorado has largest area of hardwood types

Aspen is the principal hardwood type and occurs for the most part in the southern Rocky Mountain area. Of the 5.9 million acres of hardwoods in the Mountain States, 4.6 million acres are in this area. In the Mountain States, Colorado has the largest area of hardwoods (2.9 million acres), and in Utah these types account for the largest proportion of the commercial forest (32 percent).

Timber Volumes

Idaho and Montana contain most of the timber volume in the Mountain States

Nearly two-thirds of the 97.8 billion cubic feet of sound, live trees in the Rocky Mountain States grow in northern States. Idaho and Montana together account for 55 percent of the Mountain States' total.

Practically all of the volume in the Rockies is in softwood trees. In the northern Rocky Mountains, softwoods make up 99 percent of the volume, compared with 88 percent in the southern Rockies. In Utah, hardwoods (mostly aspen) account for 23 percent of the cubic-foot volume--the largest proportion found in the Mountain States.

Idaho and Montana have the largest volumes per acre of sound, live trees of pole size and larger in sawtimber stands:

State [1]	Average volume per acre (Cubic feet)
Idaho	2,397
Montana	2,292
Colorado	1,978
Wyoming	1,944
Utah	1,774
Arizona	1,589
New Mexico	1,159
South Dakota (western)	1,020
Average	1,953

[1] Data for Nevada are not available.

The bulk of the volume is publicly owned

Eighty-three percent of the cubic-foot volume of timber in the Mountain States is publicly owned. Of this, almost 90 percent is on National Forests.

Arizona's 98 percent is the highest proportion of publicly owned cubic-foot volume among the Mountain States. (Only Alaska has a higher proportion among all States.) In contrast, three-fourths of the volume in Nevada is privately owned. The 6.6 billion cubic feet in private ownership in Montana is the largest such volume in the Mountain States, although it represents only 25 percent of that State's total volume.

Largest volumes in Douglas-fir and ponderosa pine

Douglas-fir (18.6 billion cubic feet) and ponderosa pine (17.9 billion cubic feet) together account for 37 percent of the Mountain States' total volume of timber. Three-fourths of the Douglas-fir volume is in Idaho and Montana. The ponderosa pine volume is slightly less than that of Douglas-fir, despite the fact that there are 6.1 million acres more in the ponderosa pine type than in the Douglas-fir type. More ponderosa pine volume is found in the southern Mountain States than in northern Mountain States. The Southwest alone contains 9.0 billion cubic feet--more than one-half the Mountain States' total for this species.

The volume of lodgepole pine is 16.9 billion cubic feet or 17 percent of the Mountain States' total volume of all species. Three-fourths of the lodgepole pine volume is in the northern Rocky Mountains--mostly in Montana.

Engelmann spruce volume is 14.2 billion cubic feet or 15 percent of the Rocky Mountain volume for all species. The southern Rocky Mountain States contain somewhat more spruce volume than those in the north; the bulk of this (6.4 billion cubic feet) is found in Colorado.

True firs make up 12.6 billion cubic feet or 13 percent of the volume for all species in the Rockies. Two thirds of this volume is in the northern Rocky Mountains.

Other softwood species--principally western larch, western white pine, western hemlock, and western redcedar--provide 12.3 billion cubic feet or 13 percent of the total volume in the Mountain States. Practically all of this volume is in Idaho and Montana.

Hardwoods account for 5.2 billion cubic feet in the Rockies, which is 5 percent of the total volume. The southern Rocky Mountains grow the bulk (83 percent) and Colorado has the largest share (2.4 billion cubic feet).

Much of the volume is in small diameter trees

Nearly 75 percent of the cubic-foot volume in the Rocky Mountains is in trees less than 19 inches in diameter at breast height (d.b.h.). This compares with 61 percent of the sawtimber volume. Only 6 percent of the cubic-foot volume and 10 percent of the sawtimber volume are in trees over 30 inches d.b.h. There is little difference in proportion of sawtimber volume in larger diameters between the northern and southern Rocky Mountain States.

Growth and Cut

Growth information of limited value in Mountain States

Current growth rates are not particularly useful criteria for comparing Mountain States with each other or the Rocky Mountain region with other regions of the country. The high level of mortality associated with the large areas of old-growth timber in the Rocky Mountains results in comparatively low net growth rates (because mortality is subtracted from gross growth to obtain net growth). A relatively high current growth rate for an area usually indicates that old-growth sawtimber has been liquidated more rapidly than elsewhere and has been replaced by vigorous, young stands. A comparison of current growth rates among Mountain States, then, probably is most useful in gaging the speed of removal of a State's overmature stands. Until wild stands have been converted to managed stands throughout the Rocky Mountains, current growth rates will not even roughly reflect the inherent growth capacity in each State.

Net growth rate of sound, live trees highest in western South Dakota

In western South Dakota the net growth of 21 million cubic feet in 1962 was 2.11 percent of the State's inventory of growing stock. This is the highest rate among the Rocky Mountain States, and is more than double the Mountain States' average of 0.97 percent. Arizona's 1962 growth of 90 million cubic feet was 1.48 percent of inventory--the second highest growth rate in the Mountain States. Logging has been widespread in both western South Dakota and Arizona over the years. This probably accounts for their current relatively high net growth rates. This logging was possible because of relatively accessible timberlands and active markets for mine timbers, lumber, and other products; it served to remove high risk trees before

they died. Mortality rates were lowered and growth rates were raised. The net effect was to alter stand structure by replacing many decadent, slow-growing trees with thrifty, young growth.

Early logging also occurred in Idaho, Montana, and elsewhere, but was not nearly as widespread in relation to the total area of each State. Consequently, current growth rates for these States as a whole do not reflect this early cutting nearly as much as those for Arizona and South Dakota.

The 1962 data show Idaho (283 million cubic feet) and Montana (198 million cubic feet) as the Mountain States with the greatest volumes of growth. Respective net growth rates were 1.07 percent and 0.74 percent of inventory.

Cutting rate highest in western South Dakota

The 12 million cubic feet of sound, live trees harvested in western South Dakota during 1962 represented 1.20 percent of the inventory in that State. This is the highest rate of the Mountain States (average 0.70 percent). Cutting rates for northern Mountain States averaged 0.85 percent of growing stock inventory. The southern Rocky Mountain States averaged much lower (0.43 percent), and Colorado (0.21 percent) and Utah (0.22 percent) had the lowest rates.

The Mountain States' average cutting rate for sawtimber is 0.97 percent of the sawtimber inventory. Western South Dakota (1.55 percent) and Arizona (1.50 percent) have the highest rates, and Colorado and Utah, each with 0.30 percent, have the lowest rates.

Growing stock and sawtimber cutting rates are further illustrated in figure 17.

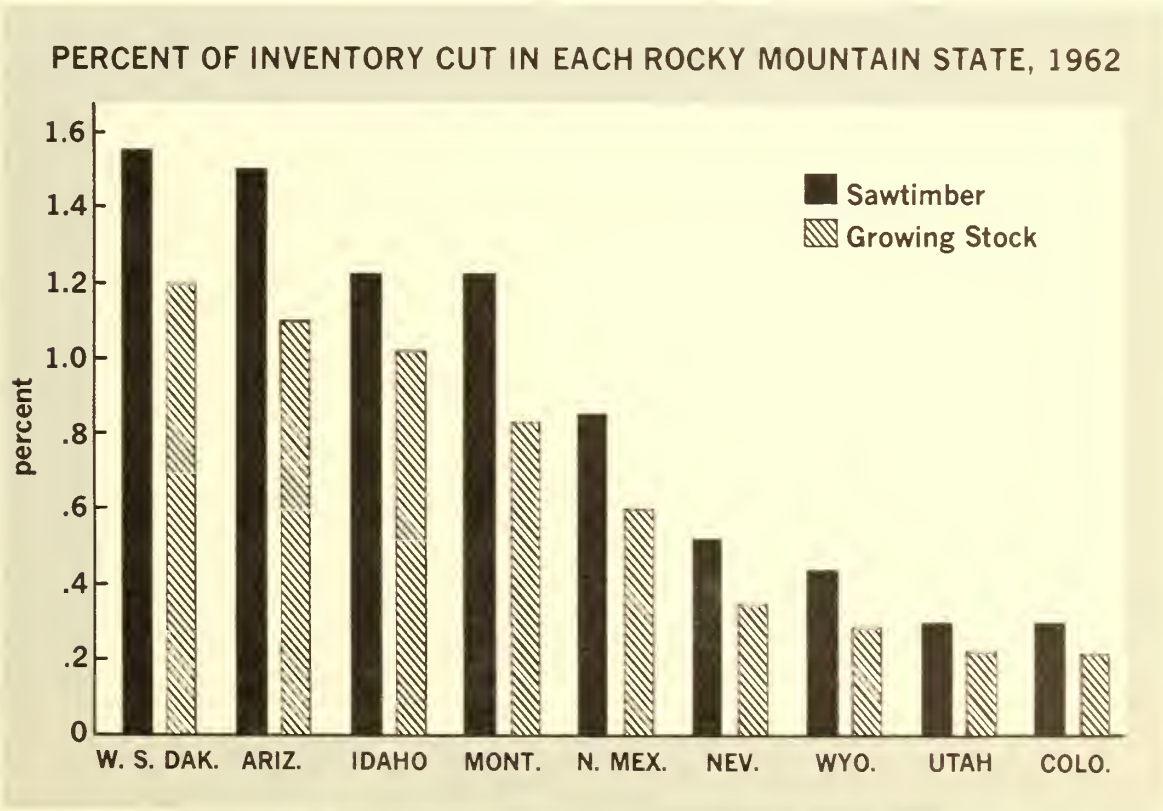


Figure 17

TIMBER INDUSTRIES

Distribution

Timber industry capacity greatest in northern Idaho and western Montana

The distribution of the principal wood-using plants in relation to the occurrence of commercial forest land in the Rocky Mountain States is shown on one of the two foldout maps. Sawmills, plywood plants, and pulpmills are noticeably concentrated in northern Idaho and western Montana, but western South Dakota and Colorado also have above-average densities in sawmills. Nearly 47 percent of all Mountain States' sawmills is in Idaho and Montana, and 23 percent is in Colorado and western South Dakota.

Eleven of the 12 plywood and veneer plants operating in the Mountain States in 1965 were located in Idaho and Montana. Five of these plants were in Idaho, six in Montana, and one in Colorado. By 1965, four pulpmills were also in operation--one each in Idaho and Montana, and two in Arizona.

The Mountain States' only particle board plant is in northern Idaho, but about 50 pole and post yards are distributed throughout the region. About a dozen shingle and shake mills (most of which are in Idaho) and an equal number of plants producing house logs were operating in 1962. Five charcoal producers are scattered from Montana to New Mexico, but the seven excelsior plants are located in only three States--Arizona, Colorado, and Utah. Most of the specialty plants, producing items such as aspen panel board products, cedar fence pickets, and industrial gum (arabinogalactan from larch), are located in Idaho and Montana.

Production

70 percent of timber products made in Idaho and Montana

Idaho and Montana have held a clear lead in the output of roundwood products ever since the first logging in the Mountain States. The white pine and ponderosa pine stands of these two States attracted substantial industrial development around 1900. This industrial capacity has continued and grown, although other species have since moved to leading positions, at least in point of volume consumed. In the latest year of record, 1962, the relative standing of the several Mountain States was as follows for the output of all roundwood products:

State	Roundwood products	
	(M cu. ft.)	(Percent)
Idaho	249,231	38.4
Montana	207,289	31.9
Arizona	65,529	10.1
New Mexico	46,259	7.1
Colorado	36,433	5.6
Wyoming	20,771	3.2
Utah	12,005	1.9
South Dakota (west)	11,235	1.7
Nevada	846	.1
Total	649,598	100.0

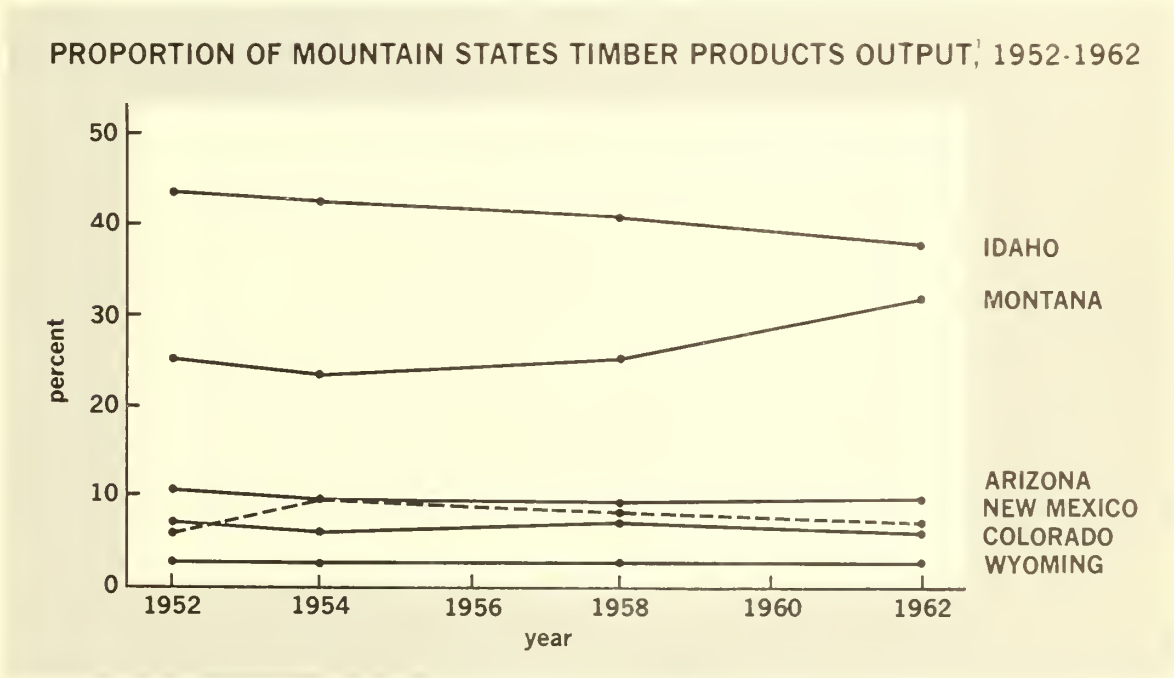
Since 1952 there have been few changes in the relative positions of the nine States in products output, but Montana's share of the total appears to be increasing rapidly while Idaho's share shows some tendency to decline (figure 18). New Mexico traded places with Colorado between 1952 and 1954 and has since maintained fourth place following Arizona.

48 percent of roundwood products from ponderosa pine and Douglas-fir

Ponderosa pine is the most important species for roundwood products in the Mountain States, but Douglas-fir is not far behind (figure 20). Out of an all-species total of 650 million cubic feet, 171 million cubic feet of ponderosa pine and 140 million cubic feet of Douglas-fir were made into roundwood products in 1962. Ponderosa pine is the dominant species in Arizona, New Mexico, western South Dakota, and Nevada, but large amounts are also cut in Idaho and Montana. Douglas-fir is the leader in Idaho and Montana--90 percent of all the Douglas-fir cut for timber products in the Mountain States comes from these two States. The true firs and western white pine are also important in Idaho; western larch is the second most important species in Montana. Wyoming's top species is lodgepole pine, and Colorado's is Engelmann spruce.

57 percent of timber products come from National Forest lands

The National Forests were the prime source of timber products in eight of the nine Mountain States, and accounted for 57 percent of all roundwood products in 1962. Forest industry lands led all other ownership classes in Nevada, and for the Mountain States as a whole, this ownership class ranked second in output and was particularly important in Idaho and Montana.



[1] Utah, Nevada, and Western South Dakota not plotted because of low percentage values.

Figure 18

Figure 19.--Part of log deck at Navajo Forest Products Industries sawmill at Navajo, New Mexico. Although most of the timber harvested in the Mountain States is still sawn into lumber (as these ponderosa pine logs will be) the pulp and veneer industries are important users of wood in parts of the Rockies.

Production by general ownership classes in 1962 is shown in the following tabulation:

Ownership class	Timber products output (Million cubic feet)
National Forests	369
Other public	73
Forest industry	114
Other private	94
Total	650

Saw logs are dominant timber product

Saw logs for lumber have always been the principal roundwood product in the Mountain States. In 1962 a total of 3,820 million board feet was produced. This constituted 88 percent of all timber products and dominated the roundwood output of all nine States. Within States, the percentage of total output in saw logs ranged from 48 (Nevada) to 94 (in both Idaho and Wyoming), based on cubic-foot volumes.

Since saw logs are the predominant product, the foldout map showing saw log output by counties in 1962 provides an index to timber producing localities as well as a means of estimating the relative importance of these localities. Lincoln, Flathead, and Missoula Counties in Montana, and Clearwater and Idaho Counties in Idaho were the leading producers in the northern Rockies; but large volumes were also produced in Sanders County, Montana, and Bonner, Kootenai, and Shoshone Counties in Idaho. In the southern Mountain States, Coconino County in Arizona led in saw log production, followed by Apache County in Arizona, and Catron County in New Mexico.

Almost 54 percent (by weight) of the shipments of lumber and dimension stock from Mountain States[9] was sent to other Mountain States in 1963 (67). About 12 percent was exported to East North Central States (Illinois, Indiana, Michigan, Ohio, and Wisconsin), and 10 percent was shipped to both the Pacific Coast States (Washington, Oregon, California, Alaska, and Hawaii) and to the West North Central States (Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota).

Nearly one-third (by weight) of the imports of lumber and dimension stock into Mountain States during 1963 came from Pacific Coast States.

Sixty-two percent of the 24 million tons of shipments of lumber and dimension stock in the entire West was transported by rail during 1963; 32 percent was hauled by trucks. The Pacific Coast States are included in these data, but proportions for Mountain States alone probably are similar.

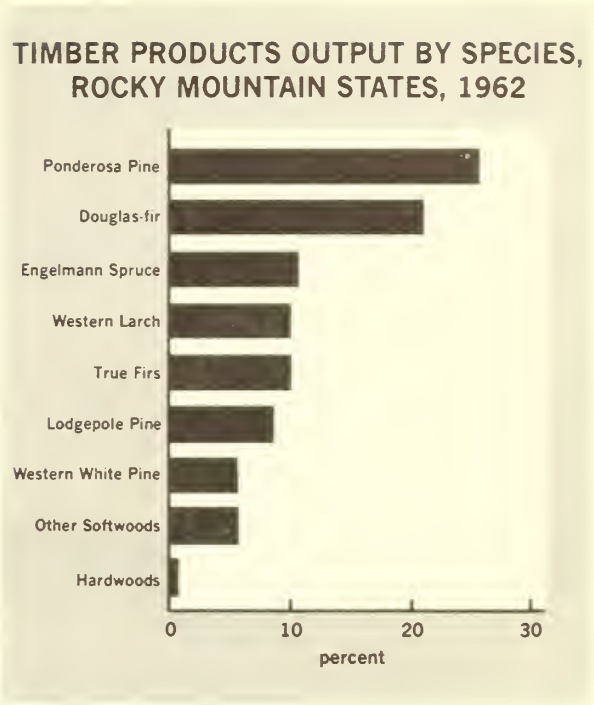


Figure 20

Round pulpwood second most important timber product

Although the volume involved is not great compared to that of saw logs, the 242,000 cords of round pulpwood produced in 1962 ranked this as the second most important single roundwood product in the Mountain States. Arizona, Idaho, Montana, and western South Dakota were the principal producing States, and smaller amounts were cut in Wyoming and Colorado.

Veneer logs important product in Montana and Idaho

Veneer logs were produced only in Montana and Idaho in 1962, but the volume handled (130 million board feet) was sufficient to place this product in third place in the Mountain States. Eighty-five percent of the veneer logs was produced in Montana and the remainder was produced in Idaho.

Posts, fuelwood, and miscellaneous farm timbers as a group constituted 4 percent of the roundwood output. A total of 28 million cubic feet was produced in 1962; New Mexico and Arizona were the top producing States. More than half of the 1962 output of commercial poles (5 million cubic feet) was produced in Idaho, and Colorado produced 45 percent of the round mine timbers and 44 percent of the miscellaneous industrial wood.

[9] In the Bureau of the Census data used for this analysis, the Mountain States did not include western South Dakota.

Trends

As pointed out earlier, the Mountain States exhibited the strongest upward trend of any section of the country in output of all timber products from 1952 to 1962. Production in 1962 (650 million cubic feet) was 44 percent more than in 1952 (452 million cubic feet). For the same period the United States as a whole showed a decline of 7 percent.

General production trends are upward but vary in strength between States

All Rocky Mountain States show substantial increases in roundwood production in 1962 as compared with 1952, but data for the intermediate years, 1954 and 1958, show that increases in some States followed a more consistently upward course than others. Montana exhibited the strongest and most consistent upward trend (fig. 21); the 1962 output was 77 percent more than that of 1952. Relatively steady upward trends occurred in Wyoming, Idaho, and Arizona. Although trends in other States were generally upward and were especially strong in Utah and Nevada (combined) and in New Mexico, marked fluctuations occur from year to year.

Principal increases were in saw log production

Saw log production in all Mountain States (with minor exceptions in Wyoming and western South Dakota) shows a stronger upward trend (and in most States a more consistent one) than is shown by all roundwood products combined. Saw log production increases were evidently the principal factor in the remarkable gains made from 1952 to 1962 in total roundwood output.

Because of the continuity of the record, Census Bureau lumber production data provide a further means for appraising the course of saw log production within States. These data show that the largest contributors to the output of saw logs, and thus the principals in creating and maintaining the upward movement, were Idaho and Montana. However, similar trends appear in most other Mountain States (fig. 22).

Accompanying this growth there has been a definite tendency for active sawmills to decrease in number, but increase in average size. This tendency is observable throughout the Mountain States (table 3).

Table 3.--Changes in numbers of active sawmills and lumber production per mill, 1962, from previous year of record[1]

State	Base year	Change	
		Number of mills	M bd. ft. per mill
Idaho	1956	-118	+2,681
Montana	1956	-124	+2,169
Wyoming	1957	-31	+339
Arizona	1960	-10	+2,963
Colorado	1957	-104	+538
New Mexico	1960	-32	+935
Utah and Nevada	1960	-24	+687

[1] Western South Dakota not shown because no data are available for a previous year.

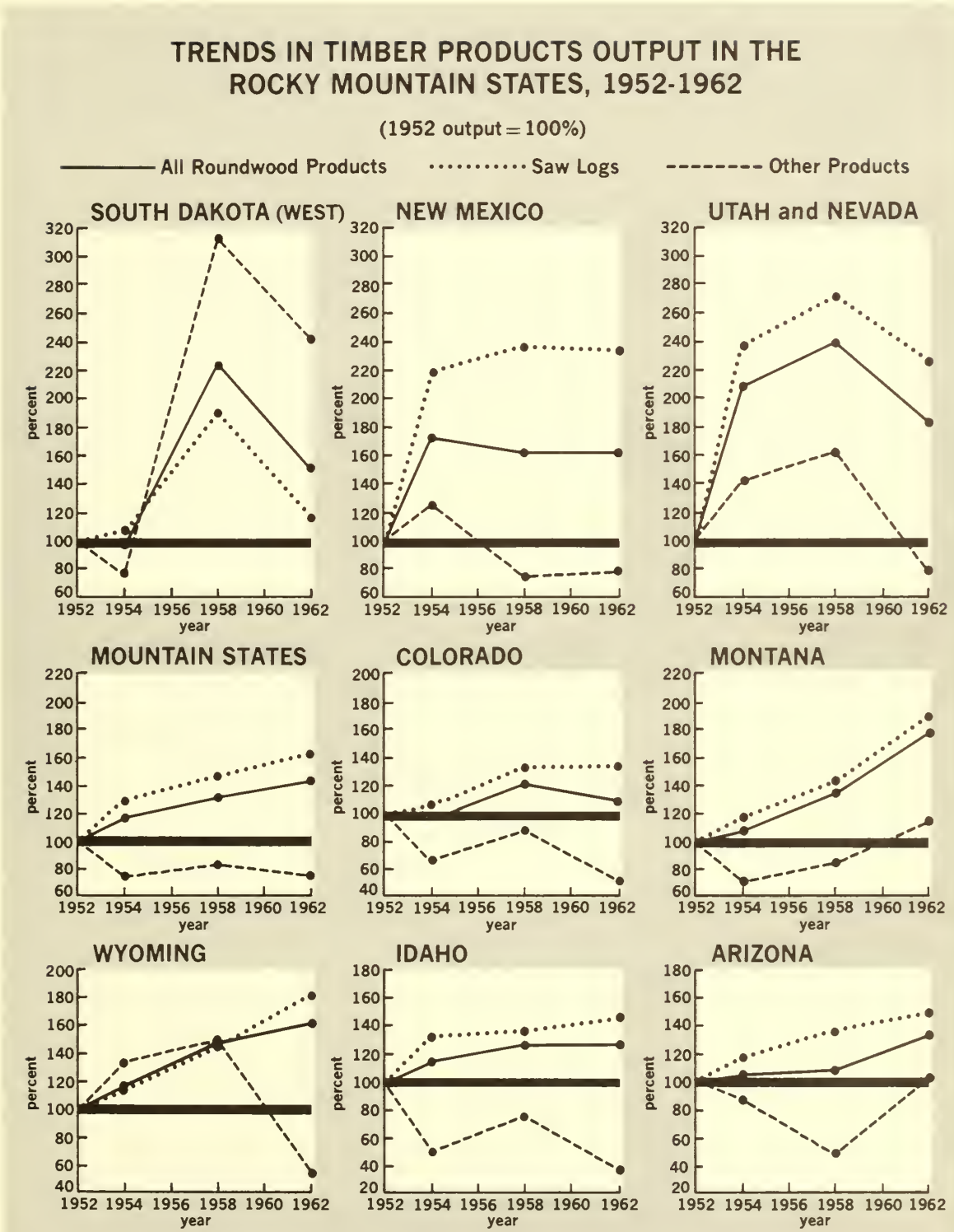

TRENDS IN TIMBER PRODUCTS OUTPUT IN THE ROCKY MOUNTAIN STATES, 1952-1962
(1952 output = 100%)
All Roundwood Products
Saw Logs
Other Products
SOUTH DAKOTA (WEST)
NEW MEXICO
UTAH and NEVADA
MOUNTAIN STATES
COLORADO
MONTANA
WYOMING
IDAHO
ARIZONA
percent
year
1952 1954 1956 1958 1960 1962

Figure 21

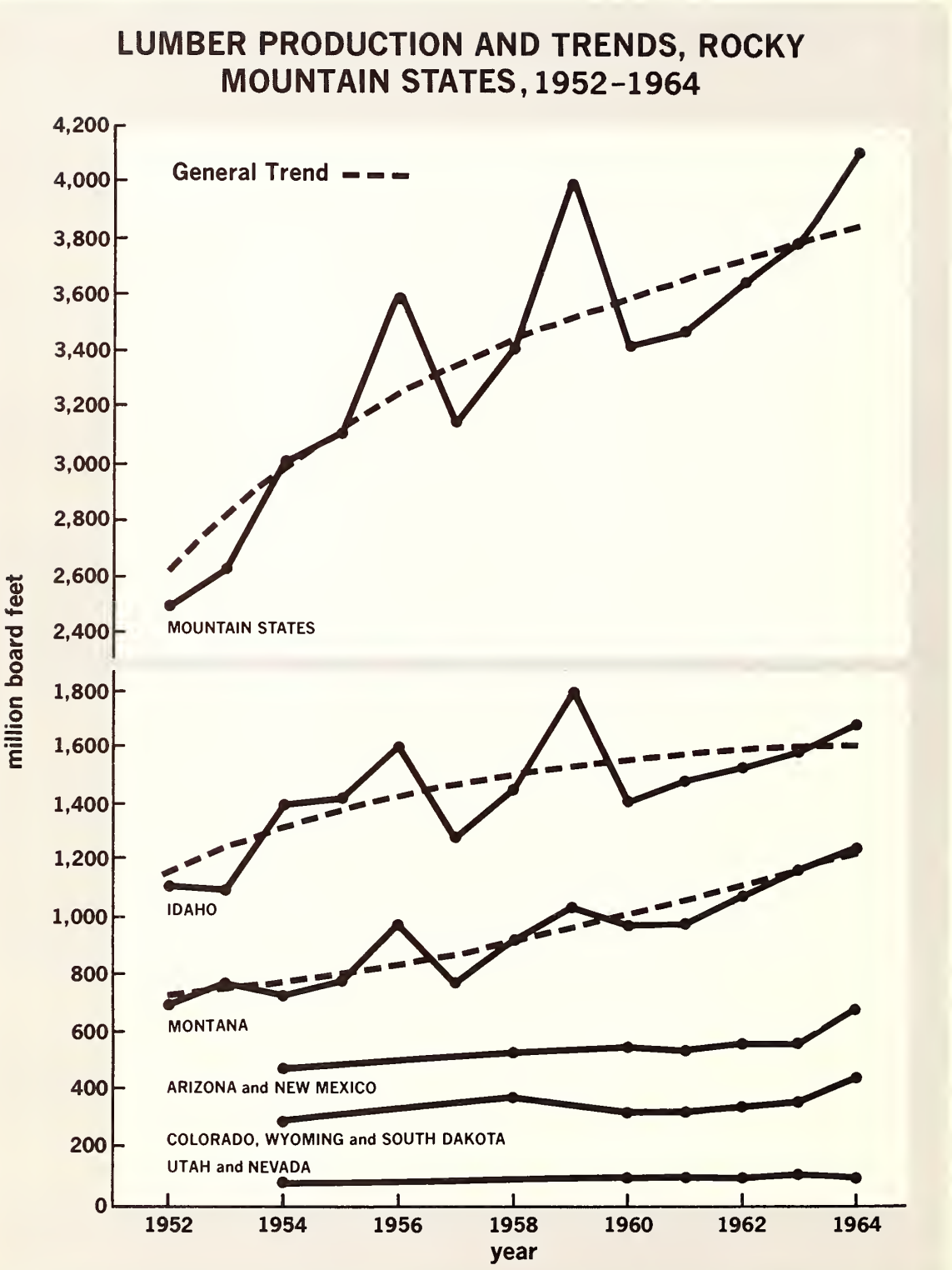

LUMBER PRODUCTION AND TRENDS, ROCKY MOUNTAIN STATES, 1952-1964
General Trend
MOUNTAIN STATES
IDAHO
MONTANA
ARIZONA and NEW MEXICO
COLORADO, WYOMING and SOUTH DAKOTA
UTAH and NEVADA
million board feet
year
4,200
4,000
3,800
3,600
3,400
3,200
3,000
2,800
2,600
2,400
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
1952
1954
1956
1958
1960
1962
1964

Figure 22

Other products show variety of trends

Products other than saw logs show more erratic trends between 1952 and 1962. These "other products" include veneer logs, round pulpwood, and a variety of miscellaneous roundwood products.[10] The general trend of these for all Mountain States combined shows a decline from 1952 to 1954, followed by a leveling off at about 80 percent of the 1952 output (fig. 21).

Among Mountain States, downward tendencies are most marked in Idaho, Colorado, and New Mexico. In Idaho, the decline occurred principally in the miscellaneous products, which by 1962 amounted only to 24 percent of the 1952 output. However, a decrease in round pulpwood production to 53 percent of 1952 output contributed to the decline and helped to cancel gains made in veneer log production. Idaho veneer log production in 1962 was more than twice the 1952 level. In Colorado and New Mexico the decline was also principally in miscellaneous products, but was additionally influenced in Colorado by a decline in round pulpwood production to 30 percent of its 1952 figure.

Arizona's downtrend in products other than saw logs from 1952 to 1958 was abruptly reversed with the start of round pulpwood production around 1958. Although by 1958 miscellaneous products had fallen to 48 percent of their 1952 level, round pulpwood production brought the combined output back up so strongly that by 1962, output was 1 percent above the 1952 figure.

In Montana, the trend for products other than saw logs was downward from 1952 to 1954. Since 1954, this trend has turned strongly upward, which is in contrast to trends in most Mountain States. By 1962, output was 14 percent higher than in 1952. It is noteworthy that veneer log production increases alone brought about this growth by overcompensating for severe declines in round pulpwood and miscellaneous wood products outputs.

Utah and Nevada (combined) and Wyoming showed strong upward trends for products other than saw logs for much of the 1952-62 period, but fell off sharply after 1958. In Wyoming, strong gains in round pulpwood production (1962 output was nearly $6\frac{1}{2}$ times that of 1952) were insufficient to overcome declines in other products; therefore, 1962 production, other than saw logs, was down to 54 percent of the 1952 level. Utah and Nevada's combined output of miscellaneous products in 1962 was down to 76 percent of the 1952 figure.

For the same period, western South Dakota exhibited the most marked upward trend in products other than saw logs, although here, too, a tendency to decline toward the end of the period is indicated. Strong increases in round pulpwood production throughout the period were accompanied by large increases in other products until about 1958, when declines in these other products caused a downturn. Even so, 1962 output was nearly $2\frac{1}{2}$ times that of 1952.

Large gains in plywood and pulp industries

In passing, it has been briefly pointed out that certain industries, particularly plywood and pulp manufacturing, have undergone some rather remarkable changes since 1952. In all the Mountain States, only two plywood plants (one each in Idaho and Montana) and one veneer plant[11] (in Idaho) were operating in 1952. By 1962, seven plants (two in Idaho, five in Montana) were in operation and

[10] Includes products such as commercial poles, house logs, converter poles, shingle logs and bolts, excelsior bolts, match splint logs, charcoal wood, round mine timbers, posts, fuelwood, and miscellaneous farm timbers. Output trends for single products among these may differ from the trend of the entire group.

[11] A container veneer plant in southern Idaho which went out of business about 1954. A veneer plant started up in northern Idaho about 1956 and has been in continuous operation since.

Figure 23.--The Southwest Forest Industries, Inc., pulpmill near Snowflake, Arizona, uses underground water entirely in the manufacturing process. This mill produces about 165,000 tons of Kraft linerboard and newsprint per year using round pulpwood and chipped sawmill residues (foreground).

plywood production was estimated to be 12 times that of 1952. Four more plants went into operation between 1962 and 1965. Two of these are in Idaho, one in Montana, and one in Colorado. Plywood production of all 12 plants in 1965 was estimated to be about 36 times the output in 1952. Installed plant capacity, as of 1965, totals 1,005 million square feet annually, 3/8-inch basis (41).

Pulp production capacity in the Mountain States is limited to one mill in Idaho, one in Montana, and two in Arizona. One of the Arizona mills began production in 1965 on the site of a groundwood mill that closed after operating for a short time about 1956-57. The other mill in Arizona started producing in 1961. Its use of underground water is particularly significant (fig. 23). The successful operation of this mill has done much to dispel the belief that surface water supplies set rather rigid limits to the pulpmill capacity that can be supported in the Mountain States. Installed pulpmill capacity in the Mountain States in 1965 was nearly 1,900 tons per day, or nine times the capacity existing in 1952.

However, these increases cannot be taken to mean that round pulpwood consumption went up correspondingly. The increasing use of chipped sawmill residues for pulp production has had a definite effect on the rate of increase in output of round pulpwood. This is pointed up by comparing the Mountain States wood pulp production, which in 1962 was nearly eight times the output in 1952, with round pulpwood production, which was only 10 percent higher in 1962 than in 1952.

Although the timber industries of the Rocky Mountain States are still oriented strongly toward lumber production, and saw logs are by far the principal roundwood product, the rapid changes now taking place in the plywood and pulp industries presage more and probably faster changes to come.

ECONOMIC COMPARISONS

Lumber and wood products manufacturing industries[12] are important contributors to the economy of the Rocky Mountain area--especially in the northern Mountain States. Following is a short discussion of some of the economic values generated by these timber-based industries.

Idaho and Montana account for two-thirds of timber-based jobs in Rockies

Nearly 30,000 persons were employed in 1963 in lumber and wood products manufacturing industries in the Rocky Mountain States. This is 10 percent of all persons employed by all manufacturing industries in that area. In 1963, employment in timber industries was 9 percent greater than in 1958. Almost 21,000 of the timber industry employees were in the northern Mountain States--19,000 in Idaho and Montana. Lumber and wood products manufacturers accounted for 29 percent of the total employees of manufacturing industries in northern Mountain States, compared with only 4 percent in the southern Mountain States. In Idaho and Montana these figures were 34 and 41 percent, respectively. The share of the manufacturing work force provided by timber-based industries was 2 percent in Utah and 3 percent in Colorado.

Almost 27,000 of the above 30,000 employees were production workers, most of whom were employed by sawmills and planing mills. Foresters and others engaged in timber management activities are not included as production workers.

Timber-based industries in the Mountain States have a payroll of $140 million

The $140 million that lumber and wood products industries paid to their employees in 1963 is a 21 percent gain over the 1958 figure, and represents 8 percent of the total payroll of all manufacturers in the Rocky Mountains. Just as most of the employees are in northern Mountain States, so is most of the payroll--almost three-fourths of it. Idaho and Montana together account for more than two-thirds of the Mountain States timber-based payroll.

Value added by manufacture for timber-based industries was $232 million in 1963

Value added by manufacture--the difference between the cost of goods purchased by an enterprise and the value of the product it sells--is an economic yardstick useful in measuring the dollar-generating ability of an industry. For all lumber and wood products industries in the Rocky Mountains, value added by manufacture (in harvesting and processing timber) amounted to $232 million during 1963. This was 36 percent greater than the $170 million added in 1958. It was also only 6 percent of the total value added by all manufacturers in 1963. When this 6-percent figure is compared with the previously mentioned facts that timber-based industries accounted for 10 percent of the number of employees and 8 percent of the total payroll of all manufacturers in the Rocky Mountains, it is clear that "value added" lags behind. Apparently lumber and wood products industries do not add as much value as the average manufacturing industry in the Mountain States does.

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[12] The U.S. Bureau of the Census provides certain economic data for Standard Industrial Classification (SIC) Code 24, lumber and wood products manufacturing industries. This classification includes logging operations, sawmills, planing mills, millwork plants (includes veneer and plywood plants), wood preserving concerns, and other primary wood conversion industries. Similar information has not been published for the pulp and paper manufacturing industry (SIC Code 26) in the Mountain States, although this is an important wood-using industry in Idaho, Montana, and Arizona.

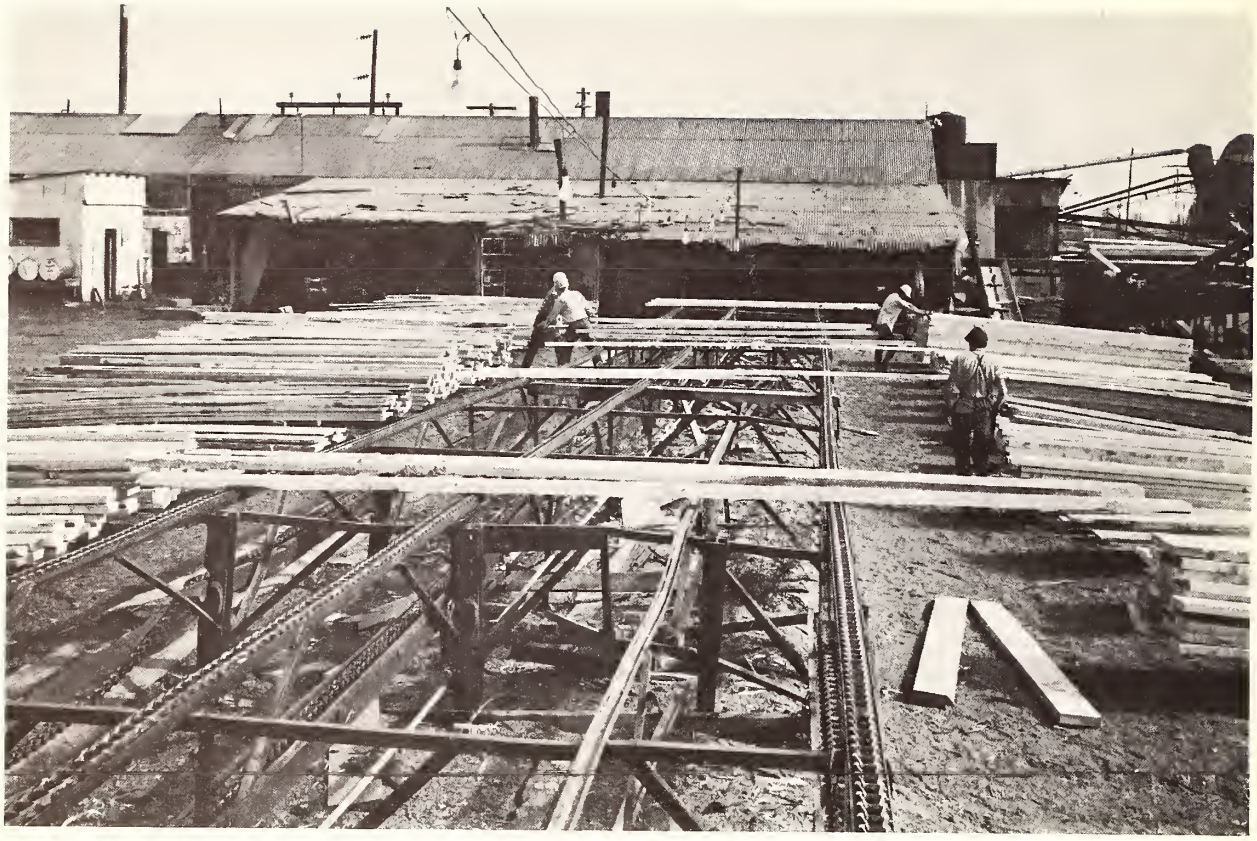


Figure 24.--Crofts-Pearson Industries sawmill at Panguitch, Utah. This mill produces about 120,000 board feet of lumber per day, which easily makes it the largest mill in the State. Because mills in Utah are few and generally small, the number of jobs provided by timber-based industries also is small.

In terms of value added by manufacture per employee in the lumber and wood products industries, the Rocky Mountain States average of $7,800 is above the $7,100 average for the United States. Both of these figures are less than two-thirds of the respective averages for all manufacturing industries. Within the Mountain States,[13] the range is from a high of $8,400 per lumber and wood products industries employee in Idaho to a low of $5,500 per employee in Utah.

Idaho and Montana together contribute $157 million in value added, which is two-thirds of the timber-based industry total in the Mountain States. South Dakota[14] accounted for the smallest share of value added ($4.5 million) and was the only Mountain State to have a smaller amount in 1963 than in 1958. Wyoming showed the greatest increase (70 percent) in this 6-year period.

[13] Nevada was excluded from this comparison because of the small number of persons employed in lumber and wood products industries in that State.

[14] All of the economic data provided by the Bureau of the Census is for the entire State. However, practically all of the lumber and wood products manufacturers are located in western South Dakota.

Capital expenditures in Rocky Mountains reached $30 million in 1963

Capital expenditures on plant and equipment are a useful means of gaging the optimism of businessmen and the confidence they have in the long-term success of the enterprise. In 1963, such expenditures in the Mountain States for lumber and wood products industries totaled nearly $30 million--53 percent more than the $19 million spent in 1958. The 1963 expenditures were 12 percent of the total capital expenditures for all manufacturing industries in the Rocky Mountain States.

Capital expenditures by timber-based industries in Idaho ($12 million) and Montana ($9 million) together accounted for nearly three-fourths of the Rocky Mountain total for these expenditures. All Mountain States showed an increase in the amount of capital expenditures in 1963 over 1958 except Colorado, where there was a decrease of 39 percent.

Other information, as well as data in this report, necessary for projecting future timber use

The most recent data on employment, payrolls, value added by manufacture, and capital expenditures have been discussed here to permit certain comparisons within the Rocky Mountain States. These data, however, have practically no value for estimating or projecting future industrial development in the various States unless they are used along with other information and certain assumptions. Important factors that must be considered are the inventory (amount, size and species of trees, stand conditions, accessibility, etc.), present cut (amount, size and species of trees, etc.), present industrial installation (mill capacities and locations, efficiency, products, diversification, etc.), markets (size and location, stability, etc.), transportation facilities and costs, and other considerations.

The present situation with respect to some of these factors is shown in statistical tables on the following pages and has been discussed earlier. Information on many of the factors must come from special studies before analyses can be made to project future industrial development in the Rocky Mountain States.

Table 4.--LAND AREAS IN THE ROCKY MOUNTAIN STATES, BY MAJOR LAND CLASSES, 1962

State	Total land area[1]	Forest land				Nonforest land
		Total	Commercial	Productive reserved	Unproductive	
	Thousand acres					
Idaho	52,933	21,815	15,823	1,867	4,125	31,118
Montana	93,271	22,048	17,300	1,356	3,392	71,223
South Dakota (west)	6,879	1,399	1,311	20	68	5,480
Wyoming	62,343	9,777	4,853	2,580	2,344	52,566
Arizona	72,688	20,598	3,977	353	16,268	52,090
Colorado	66,486	22,583	12,275	465	9,843	43,903
Nevada	70,264	12,036	109	27	11,900	58,228
New Mexico	77,766	18,187	6,269	561	11,357	59,579
Utah	52,697	14,865	3,999	165	10,701	37,832
Total	555,327	143,308	65,916	7,394	69,998[2]	412,019

[1] From U.S. Bureau of the Census, Land and Water Area of the United States, 1960.

[2] Includes 4,710 thousand acres of reserved forest land.

Table 5.--AREA OF COMMERCIAL FOREST LAND IN THE ROCKY MOUNTAIN STATES, BY OWNERSHIP CLASS, 1962

State	All ownerships	Federal					State	County and municipal	Private
		Total	National Forests	Bureau of Land Management	Indian[1]	Miscellaneous			
	Thousand acres								
Idaho	15,823	11,817	11,310	404	102	1	940	(2/)	3,066
Montana	17,300	11,801	10,578	612	595	16	601	38	4,860
South Dakota (west)	1,311	967	957	6	--	4	62	--	282
Wyoming	4,853	3,883	3,364	395	124	--	111	--	859
Arizona	3,977	3,776	2,630	2	1,144	--	32	2	167
Colorado	12,275	8,907	8,384	415	103	5	190	45	3,133
Nevada	109	32	30	2	--	--	--	--	77
New Mexico	6,269	4,161	3,458	77	617	9	172	--	1,936
Utah	3,999	3,096	2,783	155	158	--	240	--	663
Total	65,916	48,440	43,494	2,068	2,843	35	2,348	85	15,043

[1] Indian Reservation lands are under federal trusteeship and are managed by the Bureau of Indian affairs, even though these lands are private in many respects.

[2] Less than 0.5 thousand acres.

Table 6.--AREA OF COMMERCIAL FOREST LAND IN THE ROCKY MOUNTAIN STATES, BY STAND-SIZE CLASS, 1962

State	All areas	Sawtimber stands			Poletimber stands	Seedling and sapling stands	Nonstocked areas
		Total	Old growth	Young growth			
	Thousand acres						
Idaho	15,823	8,741	4,666	4,075	3,911	1,598	1,573
Montana	17,300	8,284	3,081	5,203	6,311	1,576	1,129
South Dakota (west)	1,311	708	(1/)	708	542	45	16
Wyoming	4,853	2,919	15	2,904	1,588	235	111
Arizona	3,977	3,743	1,957	1,786	128	41	65
Colorado	12,275	6,352	449	5,903	4,990	499	434
Nevada	109	79	41	38	26	1	3
New Mexico	6,269	5,454	2,971	2,483	426	169	220
Utah	3,999	2,629	572	2,057	1,125	218	27
Total	65,916	38,909	13,752	25,157	19,047	4,382	3,578

1/ Less than 0.5 thousand acres.

Table 7.--AREA OF COMMERCIAL FOREST LAND IN THE ROCKY MOUNTAIN STATES, BY OWNERSHIP GROUP AND STAND-SIZE CLASS, 1962

State	All stands	Public ownership					Private ownership				
		Total	Sawtimber stands	Poletimber stands	Seedling and sapling stands	Nonstocked areas	Total	Sawtimber stands	Poletimber stands	Seedling and sapling stands	Nonstocked areas
	Thousand acres										
Idaho	15,823	12,757	7,223	3,169	1,166	1,199	3,066	1,518	742	432	374
Montana	17,300	12,440	5,924	4,649	1,322	545	4,860	2,360	1,662	254	584
South Dakota (west)	1,311	1,029	609	373	34	13	282	99	169	11	3
Wyoming	4,853	3,994	2,341	1,349	207	97	859	578	239	28	14
Arizona	3,977	3,810	3,607	114	24	65	167	136	14	17	--
Colorado	12,275	9,142	5,071	3,540	362	169	3,133	1,281	1,450	137	265
Nevada	109	32	17	14	1	--	77	62	12	--	3
New Mexico	6,269	4,333	3,783	294	36	220	1,936	1,671	132	133	--
Utah	3,999	3,336	2,236	943	141	16	663	393	182	77	11
Total	65,916	50,873	30,811	14,445	3,293	2,324	15,043	8,098	4,602	1,089	1,254

Table 8.--AREA OF COMMERCIAL FOREST LAND IN THE ROCKY MOUNTAIN STATES, BY FOREST TYPE, 1962

State	Total all types	Softwood types								Total hardwood types
		Total	Ponderosa pine	Douglas-fir	Lodgepole pine	Fir-spruce	Larch	White pine	Other softwoods	
	Thousand acres									
Idaho	15,823	15,275	2,624	4,798	3,023	1,755	730	2,178	167	548
Montana	17,300	16,901	3,656	4,555	5,357	1,180	1,939	181	33	399
South Dakota (west)	1,311	1,311	1,288	0	--	23	0	0	--	--
Wyoming	4,853	4,508	992	701	1,802	847	0	0	166	345
Arizona	3,977	3,898	3,658	130	0	110	0	0	--	79
Colorado	12,275	9,398	2,347	1,451	2,068	3,393	0	0	139	2,877
Nevada	109	88	55	--	16	16	0	1	--	21
New Mexico	6,269	5,902	4,334	1,000	0	525	0	0	43	367
Utah	3,999	2,717	432	646	563	1,047	0	0	29	1,282
Total	65,916	59,998	19,386	13,281	12,829	8,896	2,669	2,360	577	5,918

Table 9.--VOLUME OF GROWING STOCK, SAWTIMBER, AND POLETIMBER ON COMMERCIAL FOREST LAND IN THE ROCKY MOUNTAIN STATES, 1962

State	Growing-stock trees			Sawtimber trees			Poletimber trees		
	All species	Softwoods	Hardwoods	All species	Softwoods	Hardwoods	All species	Softwoods	Hardwoods
	Million cubic feet								
Idaho	26,514	26,244	270	21,755	21,691	64	4,759	4,553	206
Montana	26,770	26,486	284	20,341	20,158	183	6,429	6,328	101
South Dakota (west)	996	991	5	685	684	1	311	307	4
Wyoming	7,458	7,134	324	5,221	5,127	94	2,237	2,007	230
Arizona	6,091	5,967	124	5,534	5,487	47	557	480	77
Colorado	17,337	14,897	2,440	12,218	11,519	699	5,119	3,378	1,741
Nevada	151	126	25	113	109	4	38	17	21
New Mexico	6,616	6,237	379	5,672	5,446	226	944	791	153
Utah	5,825	4,490	1,335	4,249	3,853	396	1,576	637	939
Total	97,758	92,572	5,186	75,788	74,074	1,714	21,970	18,498	3,472

Table 10.--VOLUME OF GROWING STOCK ON COMMERCIAL FOREST LAND IN THE ROCKY MOUNTAIN STATES, BY OWNERSHIP CLASS, 1962

State	All ownerships			National Forest			Other public			Private		
	All species	Soft-woods	Hard-woods	All species	Soft-woods	Hard-woods	All species	Soft-woods	Hard-woods	All species	Soft-woods	Hard-woods
	Million cubic feet											
Idaho	26,514	26,244	270	20,561	20,461	100	2,060	2,001	59	3,893	3,782	111
Montana	26,770	26,486	284	17,906	17,705	201	2,254	2,244	10	6,610	6,537	73
South Dakota (west)	996	991	5	782	782	(1/)	48	47	1	166	162	4
Wyoming	7,458	7,134	324	6,046	5,870	176	579	525	54	833	739	94
Arizona	6,091	5,967	124	4,389	4,345	44	1,556	1,512	44	146	110	36
Colorado	17,337	14,897	2,440	13,796	12,044	1,752	782	650	132	2,759	2,203	556
Nevada	151	126	25	38	17	21	(1/)	(1/)	(1/)	113	109	4
New Mexico	6,616	6,237	379	3,387	3,326	61	1,369	1,341	28	1,860	1,570	290
Utah	5,825	4,490	1,335	4,635	3,687	948	568	438	130	622	365	257
Total	97,758	92,572	5,186	71,540	68,237	3,303	9,216	8,758	458	17,002	15,577	1,425

1/ Less than 0.5 million cubic feet.

Table 11.--VOLUME OF SAWTIMBER ON COMMERCIAL FOREST LAND IN THE ROCKY MOUNTAIN STATES, BY OWNERSHIP CLASS, 1962

State	All ownerships			National Forest			Other public			Private		
	All species	Soft-woods	Hard-woods	All species	Soft-woods	Hard-woods	All species	Soft-woods	Hard-woods	All species	Soft-woods	Hard-woods
	Million board feet, International ¼-inch log rule											
Idaho	126,801	126,484	317	94,985	94,822	163	11,074	11,021	53	20,742	20,641	101
Montana	112,637	111,799	838	75,479	74,883	596	9,454	9,423	31	27,704	27,493	211
South Dakota (west)	3,430	3,423	7	2,687	2,687	(1/)	178	177	1	565	559	6
Wyoming	28,324	27,939	385	23,871	23,762	109	1,850	1,747	103	2,603	2,430	173
Arizona	26,951	26,692	259	19,153	19,105	48	7,297	7,203	94	501	384	117
Colorado	64,258	60,477	3,781	52,793	50,135	2,658	2,611	2,359	252	8,854	7,983	871
Nevada	572	565	7	87	84	3	2	2	--	483	479	4
New Mexico	28,343	27,110	1,233	14,859	14,678	181	6,243	6,153	90	7,241	6,279	962
Utah	22,341	20,213	2,128	18,260	16,552	1,708	2,121	1,989	132	1,960	1,672	288
Total	413,657	404,702	8,955	302,174	296,708	5,466	40,830	40,074	756	70,653	67,920	2,733

1/ Less than 0.5 million board feet.

Table 12.--VOLUME OF GROWING STOCK ON COMMERCIAL FOREST LAND IN THE ROCKY MOUNTAIN STATES, BY SPECIES, 1962

State	All species	Softwoods											Hardwoods		
		All softwoods	Douglas-fir	Ponderosa pine[1]	Lodgepole pine	Engelmann spruce[2]	True firs[3]	Western larch	Western white pine[4]	Western hemlock	Western red-cedar	Other softwoods[5]	All hardwoods	Cottonwood and aspen	Other hardwoods
	Million cubic feet														
Idaho	26,514	26,244	7,775	3,166	3,775	1,797	4,557	1,362	2,356	581	757	118	270	264	6
Montana	26,770	26,486	6,247	2,481	6,124	2,145	3,253	4,075	315	911	579	356	284	224	60
South Dakota (west)	996	991	0	945	--	46	0	0	0	0	0	--	5	--	5
Wyoming	7,458	7,134	901	696	2,768	1,694	644	0	0	0	0	431	324	324	--
Arizona	6,091	5,967	283	5,204	0	231	210	0	0	0	0	39	124	124	--
Colorado	17,337	14,897	1,590	1,017	3,286	6,404	2,409	0	0	0	0	191	2,440	2,434	6
Nevada	151	126	(6/)	74	7	1	39	0	2	0	0	3	25	14	11
New Mexico	6,616	6,237	942	3,837	0	706	594	0	0	0	0	158	379	379	--
Utah	5,825	4,490	899	434	971	1,217	912	0	0	0	0	57	1,335	1,335	--
Total	97,758	92,572	18,637	17,854	16,931	14,241	12,618	5,437	2,673	1,492	1,336	1,353	5,186	5,098	88

1/ Includes Jeffrey pine.
2/ Includes white and blue spruce.
3/ Includes grand, white, subalpine, corkbark, and California red firs.
4/ Includes sugar pine.
5/ Includes limber and whitebark pine, incense cedar.
6/ Less than 0.5 million cubic feet.

Table 13.--VOLUME OF SAWTIMBER ON COMMERCIAL FOREST LAND IN THE ROCKY MOUNTAIN STATES, BY SPECIES, 1962

State	All species	Softwoods											Hardwoods		
		All softwoods	Douglas-fir	Ponderosa pine[1]	Engelmann spruce[2]	True firs[3]	Lodgepole pine	Western larch	Western white pine[4]	Western hemlock	Western red-cedar	Other softwoods[5]	All hardwoods	Cottonwood and aspen	Other hardwoods
	Million board feet, International ¼-inch log rule														
Idaho	126,801	126,484	40,495	18,509	11,177	23,241	5,436	6,892	13,754	3,130	3,494	356	317	317	--
Montana	112,637	111,799	29,193	12,405	11,618	14,287	13,496	21,955	1,605	3,346	2,478	1,416	838	762	76
South Dakota (west)	3,430	3,423	0	3,222	201	0	--	0	0	0	0	--	7	--	7
Wyoming	28,324	27,939	4,215	2,545	8,663	2,187	8,689	0	0	0	0	1,640	385	385	--
Arizona	26,951	26,692	1,476	22,883	1,215	932	0	0	0	0	0	186	259	259	--
Colorado	64,258	60,477	6,481	4,261	30,634	8,917	9,497	0	0	0	0	687	3,781	3,770	11
Nevada	572	565	(6/)	331	3	177	33	0	7	0	0	14	7	4	3
New Mexico	28,343	27,110	5,025	16,188	3,281	1,976	0	0	0	0	0	640	1,233	1,233	--
Utah	22,341	20,213	4,258	2,019	6,229	3,785	3,670	0	0	0	0	252	2,128	2,128	--
Total	413,657	404,702	91,143	82,363	73,021	55,502	40,821	28,847	15,366	6,476	5,972	5,191	8,955	8,858	97

1/ Includes Jeffrey pine.
2/ Includes white and blue spruce.
3/ Includes grand, white, subalpine, corkbark, and California red firs.
4/ Includes sugar pine.
5/ Limber and whitebark pine, incense cedar.
6/ Less than 0.5 million board feet.

Table 14.--VOLUME OF GROWING STOCK AND SAWTIMBER ON COMMERCIAL FOREST LAND IN THE ROCKY MOUNTAIN STATES, BY SPECIES AND DIAMETER GROUPS, 1962

Diameter group	All species	Softwoods								All hardwoods
		All softwoods	Douglas-fir	Ponderosa pine[1]	Engelmann spruce[2]	True firs[3]	Western white pine[4]	Western hemlock	Other[5] softwoods	
Inches	Million cubic feet									
5.0 - 8.9	18,498	18,498	2,829	2,103	1,610	3,221	228	311	8,196	
[6] 5.0 - 10.9	3,472	0	0	0	0	0	0	0	0	3,472
9.0 - 18.9	47,075	47,075	9,477	7,581	8,147	6,979	1,177	1,027	12,687	0
[6] 11.0 - 18.9	1,579	0	0	0	0	0	0	0	0	1,579
19.0 - 29.9	20,865	20,733	4,675	5,883	3,757	2,023	860	143	3,392	132
30.0+	6,269	6,266	1,656	2,287	727	395	408	11	782	3
Total	97,758	92,572	18,637	17,854	14,241	12,618	2,673	1,492	25,057	5,186
	Million board feet, International ¼-inch log rule									
9.0 - 18.9	242,759	242,759	50,778	34,249	44,722	39,435	7,034	5,504	61,037	
[6] 11.0 - 18.9	8,211	0	0	0	0	0	0	0	0	8,211
19.0 - 29.9	121,777	121,047	30,006	30,746	23,523	13,621	5,876	902	16,373	730
30.0+	40,910	40,896	10,359	17,368	4,776	2,446	2,456	70	3,421	14
Total	413,657	404,702	91,143	82,363	73,021	55,502	15,366	6,476	80,831	8,955

[1] Includes Jeffrey pine.
[2] Includes white and blue spruce.
[3] Includes grand, white, subalpine, corkbark, and California red firs.
[4] Includes sugar pine.
[5] Includes limber pine, whitebark pine, lodgepole pine, incense cedar, western larch, and western redcedar.
[6] Hardwoods only.

Table 15.--NET ANNUAL GROWTH AND CUT OF GROWING STOCK ON COMMERCIAL FOREST LAND IN THE ROCKY MOUNTAIN STATES, BY SPECIES, 1962

State	Total all species		Softwoods														All hardwoods	
			All softwoods		Douglas-fir		Ponderosa pine[1]		Engelmann spruce[2]		True firs[3]		Western white pine[4]		Other softwoods[5]			
	Growth	Cut	Growth	Cut	Growth	Cut	Growth	Cut	Growth	Cut	Growth	Cut	Growth	Cut	Growth	Cut	Growth	Cut
	Thousand cubic feet																	
Idaho	283,100	270,275	280,100	270,120	71,229	61,438	24,957	48,129	19,495	12,606	56,636	59,295	26,806	39,980	80,977	48,672	3,000	155
Montana	197,500	222,876	195,700	222,805	49,372	74,352	20,790	32,028	10,600	29,149	17,491	4,501	3,683	5,385	93,764	77,390	1,800	71
South Dakota (west)	20,582	11,756	20,483	11,756	0	0	19,408	11,755	1,075	1	0	0	0	0	--	--	99	--
Wyoming	85,315	21,764	84,903	21,749	7,490	1,007	14,463	3,990	19,828	3,230	4,344	552	0	0	38,778	12,970	412	15
Arizona	90,253	65,941	86,601	65,745	-1,398	4,115	84,669	57,558	2,348	845	289	3,142	0	0	693	85	3,652	196
Colorado	161,356	37,556	123,767	35,888	8,385	1,410	14,992	4,269	63,625	16,415	-9,831	1,183	0	0	46,596	12,611	37,589	1,668
Nevada	1,200	538	1,200	479	[6]	11	1,000	206	--	--	[6]	244	[6]	--	200	18	[6]	59
New Mexico	53,100	39,601	63,357	39,596	-422	7,443	40,543	21,587	14,108	8,465	7,536	1,841	0	0	1,592	260	-10,257	5
Utah	56,096	12,558	33,650	11,766	5,776	1,254	6,337	2,390	7,718	4,137	872	1,794	0	0	12,947	2,191	22,446	792
Total	948,502	682,865	889,761	679,904	140,432	151,030	227,159	181,912	138,797	74,848	77,337	72,552	30,489	45,365	275,547	154,197	58,741	2,961

[1] Includes Jeffrey pine.
[2] Includes white and blue spruce.
[3] Includes grand, white, subalpine, corkbark, and California red firs.
[4] Includes sugar pine.
[5] Includes limber pine, whitebark pine, lodgepole pine, incense cedar, western larch, western redcedar, and western hemlock.
[6] Less than 0.5 thousand cubic feet.

Table 16.--NET ANNUAL GROWTH AND CUT OF SAWTIMBER ON COMMERCIAL FOREST LAND IN THE ROCKY MOUNTAIN STATES, BY SPECIES, 1962

State	Total all species		Softwoods					
			All softwoods		Douglas-fir		Ponderosa pine[1/]	
	Growth	Cut	Growth	Cut	Growth	Cut	Growth	Cut
	Thousand board feet, International ¼-inch log rule							
Idaho	1,212,000	1,561,541	1,210,000	1,560,752	341,220	354,291	161,535	277,814
Montana	892,000	1,380,927	885,000	1,380,492	301,171	465,226	170,908	220,879
South Dakota (west)	46,237	52,717	46,148	52,717	0	0	42,503	52,712
Wyoming	278,951	124,104	286,826	124,095	27,135	5,706	57,346	22,824
Arizona	344,078	404,850	341,743	404,456	-11,626	25,481	340,022	353,899
Colorado	514,256	195,601	423,742	194,216	7,879	7,574	62,406	23,112
Nevada	5,000	2,947	5,000	2,671	(6/)	61	4,000	1,149
New Mexico	216,190	241,412	229,373	241,391	-2,367	45,381	153,582	131,558
Utah	94,435	67,251	74,664	65,159	11,896	6,969	23,371	13,222
Total	3,603,147	4,031,350	3,502,496	4,025,949	675,308	910,689	1,015,673	1,097,169

State	Softwoods								All hardwoods	
	Engelmann spruce[2/]		True firs[3/]		Western white pine[4/]		Other softwoods[5/]			
	Growth	Cut	Growth	Cut	Growth	Cut	Growth	Cut	Growth	Cut
	Thousand board feet, International ¼-inch log rule									
Idaho	108,537	73,355	279,631	343,365	136,851	230,991	182,226	280,936	2,000	789
Montana	58,670	189,127	38,638	28,990	30,719	37,273	284,894	438,997	7,000	435
South Dakota (west)	3,645	5	0	0	0	0	--	--	89	--
Wyoming	94,787	18,483	46	3,101	0	0	107,512	73,981	-7,875	9
Arizona	12,665	5,258	-1,890	19,414	0	0	2,572	404	2,335	394
Colorado	303,249	88,757	-57,644	6,409	0	0	107,852	68,364	90,514	1,385
Nevada	--	--	(6/)	1,360	(6/)	--	1,000	101	(6/)	276
New Mexico	65,772	51,658	9,627	11,104	0	0	2,759	1,690	-13,183	21
Utah	26,413	22,928	-591	9,901	0	0	13,575	12,139	19,771	2,092
Total	673,738	449,571	267,817	423,644	167,570	268,264	702,390	876,612	100,651	5,401

1/ Includes Jeffrey pine.
2/ Includes white and blue spruce.
3/ Includes grand, white, subalpine, corkbark, and California red firs.
4/ Includes sugar pine.
5/ Includes limber pine, whitebark pine, lodgepole pine, incense cedar, western larch, western redcedar, and western hemlock.
6/ Less than 0.5 thousand board feet.

Table 17.--NET ANNUAL GROWTH AND CUT OF GROWING STOCK ON COMMERCIAL FOREST LAND IN THE ROCKY MOUNTAIN STATES, BY OWNERSHIP, 1962

State	All ownerships		National Forest		Other public 1/		Private	
	Growth	Cut	Growth	Cut	Growth	Cut	Growth	Cut
	Thousand cubic feet							
Idaho	283,100	270,275	212,600	131,083	24,393	36,487	46,107	102,705
Montana	197,500	222,876	128,700	125,625	17,639	10,936	51,161	86,315
South Dakota (west)	20,582	11,756	14,424	10,938	1,242	32	4,916	786
Wyoming	85,315	21,764	63,634	19,431	6,648	1,305	15,033	1,028
Arizona	90,253	65,941	--	48,005	--	11,210	--	6,726
Colorado	161,356	37,556	119,394	30,759	9,199	3,605	32,763	3,192
Nevada	1,200	538	162	37	--	--	1,038	501
New Mexico	53,100	39,601	--	20,712	--	4,474	--	14,415
Utah	56,096	12,558	55,205	11,374	-1,467	251	2,358	933
Total	2/ 948,502	682,865	594,119	397,964	57,654	68,300	153,376	216,601

1/ Bureau of Land Management lands, Indian lands, miscellaneous Federal lands, State, county, and municipal lands.

2/ Growth totals by separate ownerships do not add to "all ownerships" growth total because growth data for Arizona and New Mexico were statistically too unreliable to be shown separately by ownerships.

Table 18.--NET ANNUAL GROWTH AND CUT OF SAWTIMBER ON COMMERCIAL FOREST LAND IN THE ROCKY MOUNTAIN STATES, BY OWNERSHIP, 1962

State	All ownerships		National Forest		Other public 1/		Private	
	Growth	Cut	Growth	Cut	Growth	Cut	Growth	Cut
	Thousand board feet, International ¼-inch log rule							
Idaho	1,212,000	1,561,541	819,000	757,348	136,803	210,807	256,197	593,386
Montana	892,000	1,380,927	587,000	778,798	80,731	67,713	224,269	534,416
South Dakota (west)	46,237	52,717	25,958	49,048	4,489	142	15,790	3,527
Wyoming	278,951	124,104	181,802	110,799	30,269	7,444	66,880	5,861
Arizona	344,078	404,850	--	294,731	--	68,824	--	41,295
Colorado	514,256	195,601	363,962	160,197	35,823	18,778	114,471	16,626
Nevada	5,000	2,947	743	206	18	--	4,239	2,741
New Mexico	216,190	241,412	--	126,259	--	27,279	--	87,874
Utah	94,435	67,251	119,824	60,915	-17,008	1,345	-8,381	4,991
Total	2/ 3,603,147	4,031,350	2,098,289	2,338,301	271,125	402,332	673,465	1,290,717

1/ Bureau of Land Management lands, Indian lands, miscellaneous Federal lands, State, county, and municipal lands.

2/ Growth totals by separate ownerships do not add to "all ownerships" growth total because growth data for Arizona and New Mexico were statistically too unreliable to be shown separately by ownerships.

Table 19.--ESTIMATED VOLUME OF ROUND TIMBER PRODUCTS HARVESTED IN THE ROCKY MOUNTAIN STATES, 1962 AND 1958

State	1962					1958[1/]				
	Total	Saw logs	Veneer logs	Pulpwood	All other products[2/]	Total	Saw logs	Veneer logs	Pulpwood	All other products[2/]
	Thousand cubic feet									
Idaho	249,231	235,192	2,797	4,897	6,345	246,150	216,850	1,550	13,100	14,650
Montana	207,289	182,423	15,824	3,781	5,261	157,500	139,500	1,550	5,050	11,400
South Dakota (west)	11,235	6,493	--	3,060	1,682	19,750	10,950	--	100	8,700
Wyoming	20,771	19,617	--	464	690	19,050	15,850	--	550	2,650
Arizona	65,529	49,555	--	7,947	8,027	53,350	45,700	--	100	7,550
Colorado	36,433	31,563	--	257	4,613	40,200	31,550	--	2,200	6,450
Nevada	846	407	--	--	439	5,400	4,900	--	--	500
New Mexico	46,259	35,905	--	--	10,354	46,200	36,300	--	--	9,900
Utah	12,005	10,845	--	--	1,160	11,550	8,650	--	--	2,900
Total	649,598	572,000	18,621	20,406	38,571	599,150	510,250	3,100	21,100	64,700

[1/] See Bibliography item (22, p. 32). South Dakota data for 1958 are for the entire State but are still useful for comparison with 1962 since practically all of the State's output is from the Black Hills in the western end of the State.

[2/] Includes products such as commercial poles, houselogs, converter poles, shingle logs and bolts, excelsior bolts, match splint logs, charcoal wood, round mine timbers, posts, fuelwood, and miscellaneous farm timbers.

Table 20.--ROUNDWOOD PRODUCTS AND LOGGING RESIDUES FROM GROWING STOCK IN THE ROCKY MOUNTAIN STATES, 1962

State	Total products and residues	Roundwood products									Logging residues
		All products	Saw logs	Veneer logs	Round pulpwood	Commercial poles	Round mine timbers	Miscellaneous industrial wood[1/]	Posts, fuelwood, miscellaneous farm timbers		
	Thousand cubic feet										
Idaho	270,275	238,690	228,374	2,797	3,080	2,673	177	113	1,476		31,585
Montana	222,876	196,873	175,455	15,824	2,701	966	67	281	1,579		26,003
South Dakota (west)	11,756	11,062	6,428	--	3,060	[2/]516	--	--	1,058		694
Wyoming	21,764	19,996	19,225	--	334	7	21	15	394		1,768
Arizona	65,941	57,122	47,870	--	7,947	125	524	210	446		8,819
Colorado	37,556	34,366	30,490	--	203	482	1,331	1,316	544		3,190
Nevada	538	489	403	--	--	--	--	53	33		49
New Mexico	39,601	33,592	32,638	--	--	18	387	91	458		6,009
Utah	12,558	11,233	10,357	--	--	4	147	684	41		1,325
Total	682,865	603,423	551,240	18,621	17,325	4,791	2,654	2,763	6,029		79,442

[1/] Includes products such as house logs, converter poles, shingle logs and bolts, excelsior bolts, match splint logs, and charcoal wood.

Table 21.--OUTPUT OF ROUNDWOOD PRODUCTS IN THE ROCKY MOUNTAIN STATES, IN STANDARD UNITS, 1962

State	Saw logs			Veneer logs			Round mine timbers			Miscellaneous industrial wood[1]			Miscellaneous farm timbers		
	All species	Softwoods	Hardwoods	All species	Softwoods	Hardwoods	All species	Softwoods	Hardwoods	All species	Softwoods	Hardwoods	All species	Softwoods	Hardwoods
	Thousand board feet[2]						Thousand cubic feet								
Idaho	1,547,334	1,546,858	476	19,030	18,750	280	223	223	--	124	108	16	2,302	2,302	--
Montana	1,275,688	1,275,242	446	110,654	110,654	--	271	270	1	281	281	--	2,108	2,108	--
South Dakota (west)	38,958	38,958	--	--	--	--	--	--	--	--	--	--	447	447	--
Wyoming	116,523	116,523	--	--	--	--	54	54	--	39	24	15	409	409	--
Arizona	341,757	341,757	--	--	--	--	556	556	--	389	34	355	97	77	20
Colorado	184,645	183,490	1,155	--	--	--	1,411	1,409	2	1,316	140	1,176	373	343	30
Nevada	2,437	2,437	--	--	--	--	--	--	--	53	11	42	2	1	1
New Mexico	247,620	247,620	(6)	--	--	--	410	410	--	91	91	(6)	183	160	23
Utah	64,938	62,916	2,022	--	--	--	245	245	--	703	306	397	88	83	5
Total	3,819,900	3,815,801	4,099	129,684	129,404	280	3,170	3,167	3	2,996	995	2,001	6,009	5,930	79

State	Round pulpwood			Fuelwood			Commercial poles			Posts		
	All species	Softwoods	Hardwoods	All species	Softwoods	Hardwoods	All species	Softwoods	Hardwoods	All species	Softwoods	Hardwoods
	Thousand standard cords						Thousand pieces					
Idaho	66	66	--	5	5	(3)	150	150	--	818	818	--
Montana	47	47	--	4	4	--	122	122	--	1,047	1,047	--
South Dakota (west)	34	34	--	1	1	--	4/ 91	91	--	599	599	--
Wyoming	4	4	--	1	1	--	(5)	(5)	(5)	79	79	--
Arizona	88	88	--	97	80	17	9	9	--	173	171	2
Colorado	3	1	2	10	8	2	53	53	--	368	368	--
Nevada	--	--	--	4	3	1	--	--	--	38	38	--
New Mexico	--	--	--	134	131	3	3	3	(7)	235	230	5
Utah	--	--	--	1	1	--	(5)	(5)	(5)	16	16	--
Total	242	240	2	257	234	23	8/ 428	8/ 428	--	3,373	3,366	7

1/ Includes products such as house logs, converter poles, shingle logs and bolts, excelsior bolts, match splint logs, and charcoal wood.
2/ International ¼-inch log rule.
3/ Less than 0.5 M standard cords.
4/ Includes some piling.
5/ Withheld to avoid disclosing individual operations.
6/ A small quantity of hardwoods has been combined with softwoods to avoid disclosing individual operations.
7/ Less than 0.5 thousand pieces.
8/ Does not include numbers of poles for Wyoming and Utah. These were withheld to avoid disclosing individual operations

Table 22.--ESTIMATED VOLUME OF PLANT RESIDUES[1/] IN THE ROCKY MOUNTAIN STATES, BY INDUSTRIAL SOURCE, 1962

State	All industries			Lumber industry			Veneer and plywood industry			Other primary industries		
	Total	Coarse[2/]	Fine[3/]	Total	Coarse[2/]	Fine[3/]	Total	Coarse[2/]	Fine[3/]	Total	Coarse[2/]	Fine[3/]
	Thousand cubic feet											
Idaho	80,330	40,124	40,206	78,448	38,242	40,206	941	941	--	941	941	--
Montana	62,625	26,075	36,550	57,192	20,642	36,550	5,033	5,033	--	400	400	--
South Dakota (west)	2,747	1,144	1,603	2,534	931	1,603	--	--	--	213	213	--
Wyoming	8,583	3,610	4,973	8,566	3,593	4,973	--	--	--	17	17	--
Arizona	10,371	3,999	6,372	10,268	3,896	6,372	--	--	--	103	103	--
Colorado	15,875	8,292	7,583	15,019	7,436	7,583	--	--	--	856	856	--
Nevada	252	150	102	223	121	102	--	--	--	29	29	--
New Mexico	17,843	8,431	9,412	17,790	8,378	9,412	--	--	--	53	53	--
Utah	4,695	2,683	2,012	4,413	2,401	2,012	--	--	--	282	282	--
Total	203,321	94,508	108,813	194,453	85,640	108,813	5,974	5,974	--	2,894	2,894	--

[1/] Unused plant residues at primary manufacturing plants; i.e., do not include primary plant waste that is subsequently used for fuel or fiber (pulp or particle board).
[2/] Unused material suitable for chipping, such as slabs, edgings, veneer cores, and trimmings.
[3/] Unused material such as sawdust and shavings.

Table 23.--LUMBER PRODUCTION IN THE ROCKY MOUNTAIN STATES, 1952-1964[1/]

State	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
	Million board feet, lumber tally												
Idaho	1,106	1,101	1,399	1,413	1,608	1,277	1,437	1,802	1,405	1,467	1,516	1,568	1,656
Montana	702	757	738	785	981	773	924	1,044	985	985	1,069	1,175	1,221
South Dakota[2/]	--	--	37	--	--	--	72	--	52	46	50	50	57
Wyoming	--	--	81	--	--	[3/]109	105	107	99	97	103	112	132
Arizona	--	--	258	--	--	--	303	--	330	326	326	352	411
Colorado	--	--	174	--	--	[4/]188	209	227	181	197	208	204	257
Nevada	--	--	28	--	--	--	--	--	34	31	37	33	36
New Mexico	--	--	222	--	--	--	241	--	228	226	245	223	265
Utah	--	--	51	--	--	--	--	--	69	66	67	74	69
Total	2,498	2,624	2,988	3,085	3,587	3,120	3,381	3,990	3,383	3,441	3,621	3,791	4,104

[1/] See Bibliography items (54 through 59, 61 through 64, 66).
[2/] Data for entire State. The Bureau of the Census does not report data separately for western South Dakota. However, more than 90 percent of the State's timber industry occurs in western South Dakota.
[3/] See (45).
[4/] See (42).

Table 24.--NUMBERS OF ACTIVE SAWMILLS AND LUMBER PRODUCTION PER MILL IN THE ROCKY MOUNTAIN STATES FOR 1962 AND PREVIOUS YEARS

State	Previous year of record			1962	
	Year	No. of mills	Output per mill	No. of mills	Output per mill
			- - MBF - -		- - MBF - -
Idaho	1956	311	5,174	193	7,855
Montana	1956	333	2,946	209	5,115
South Dakota (west)	--	--	--	28	1/ 1,714
Wyoming	1957	107	1,016	76	1,355
Arizona	1960	38	8,680	28	11,643
Colorado	1957	274	686	170	1,224
Nevada	--	--	--	(2/)	(2/)
New Mexico	1960	117	1,947	85	2,882
Utah	1960	99	700	2/ 75	2/ 1,387
All mills		--	--	864	4,189

1/ Census Bureau's estimate of lumber production for the State is 50 million board feet. In 1962, western South Dakota sawmills received 96.3 percent of all saw logs received in the State. On this basis, the lumber production in western South Dakota was 48 million board feet, and output per mill was 1,714 MBF.

2/ Nevada and Utah data are combined for computing the average for 1962 becsuse of the amall number of active mills in Nevsds.

Table 25.--NUMBERS AND PRODUCTION OF ACTIVE SAWMILLS IN THE ROCKY MOUNTAIN STATES, 1962 AND PREVIOUS YEARS

State	Previous year of record													1962										
	Year	Small 1/				Medium 1/				Large 1/				Small 1/				Medium 1/				Large 1/			
		Mills		Production		Mills		Production		Mills		Production		Mills		Production		Mills		Production		Mills		Production	
		No.	%	MMBF	%	No.	%	MMBF	%	No.	%	MMBF	%	No.	%	MMBF	%	No.	%	MMBF	%	No.	%	MMBF	%
Idaho	1956	166	53	33	2	108	35	410	25	37	12	1,166	73	70	36	26	2	81	42	306	20	42	22	1,184	78
Montana	1956	229	69	65	6	78	23	263	27	26	8	653	67	129	62	25	2	40	19	109	11	40	19	935	87
South Dakota (west)	--	--	--	--	--	--	--	--	--	--	--	--	--	21	75	6	13	7	25	42	87	--	--	--	--
Wyoming	1957	85	79	22	20	22	21	87	80	--	--	--	--	57	75	13	12	19	25	90	88	--	--	--	--
Arizona	2/ 1960	11	29	3	1	27	71	327	99	--	--	--	--	8	29	2	1	20	71	324	99	--	--	--	--
Colorado	1957	227	83	53	28	47	17	135	72	--	--	--	--	125	74	32	16	45	26	176	84	--	--	--	--
Nevada 3/	--	--	--	--	--	--	--	--	--	--	--	--	--			(3/)				(3/)		--	--	--	--
New Mexico	1960	80	68	34	15	37	32	194	85	--	--	--	--	54	64	18	7	31	36	227	93	--	--	--	--
Utah 3/	1960	87	88	23	32	12	12	47	68	--	--	--	--	56	75	9	9	19	25	95	91	--	--	--	--
Total		--	--	--	--	--	--	--	--	--	--	--	--	520	--	131	--4/	344	--4/	3488	--	--	--	--	--

1/ Small mill: Less than 1 million board feet per year. Medium: 1 to 10 million per year. Large: More than 10 million board feet per year. The "medium" class for western South Dakota, Wyoming, Arizona, Colorado, New Mexico, and Utah actually includes data for all mills producing more than 1 MMBF to avoid disclosing operations data of the few mills that produce more than 10 MMBF per year.

2/ See bibliography item (43).

3/ Nevada and Utah data are combined for 1962 because of the small number of active mills in Nevada. Data shown for 1960 are for Utah only.

4/ Totals are combined for numbers snd production of medium and large mills.

Table 26.--NUMBERS OF ACTIVE SAWMILLS BY SIZE CLASSES IN THE ROCKY MOUNTAIN STATES, 1962

State	Sawmill size class in thousands of board feet per year[1/]						Total
	Less than 50	50 to 499	500 to 999	1,000 to 4,999	5,000 to 9,999	10,000 and over	
Idaho	15	39	16	53	28	42	193
Montana	50	52	27	30	10	40	209
South Dakota (west)	5	13	3	5	1	1	28
Wyoming	14	38	5	12	4	3	76
Arizona	--	8	--	7	2	11	28
Colorado	37	68	20	37	3	5	170
New Mexico	12	26	16	19	4	8	85
Utah and Nevada	19	33	5	16	--	2	75
Total	152	277	92	179	52	112	864

1/ Mill size class is ordinarily based on annual lumber production but is based on reported saw log receipts (expressed in International ¼-inch log rule volumes) in this table.

Table 27.--OUTPUT OF ALL TIMBER PRODUCTS IN THE ROCKY MOUNTAIN STATES, BY SELECTED YEARS, 1952-1962

State	1952[1/]	1954[2/]	1956	1957	1958[2/]	1960	1962
	Thousand cubic feet						
Idaho	196,566	230,000	[3/]327,907	--	246,150	--	249,231
Montana	117,233	126,750	[4/]191,626	--	157,500	--	207,289
South Dakota (west)	7,493	[5/]8,250	--	--	[5/]19,750	--	11,235
Wyoming	12,888	15,200	--	[6/]19,388	19,050	--	20,771
Arizona	48,970	52,900	--	--	53,350	[7/]61,589	65,529
Colorado	33,055	32,500	--	[6/]44,200	40,200	--	36,433
Nevada	307	4,500	--	--	5,400	[8/]3,158	846
New Mexico	28,727	50,350	--	--	46,200	[7/]53,028	46,259
Utah	6,765	10,350	--	--	11,550	[8/]14,831	12,005
Total	452,004	--	--	--	--	--	649,598

1/ See Bibliography item (68, pp. 526-527, 572-573).
2/ See (22, pp. 32-33).
3/ See (81, p. 10).
4/ See (82, p. 10).
5/ South Dakota data for 1954 and 1958 are for the entire State.
6/ See (53, pp. 6 and 13).
7/ See (83, p.7).
8/ See (51, pp. 4 and 8).

Table 28.--OUTPUT OF TIMBER PRODUCTS IN THE ROCKY MOUNTAIN STATES, BY SPECIES, 1962

State	All species	Softwoods									All hardwoods
		All softwoods	Douglas-fir	Ponderosa pine	Engelmann spruce[1/]	True firs[2/]	Western white pine	Lodgepole pine	Western larch	Other softwoods[3/]	
	Thousand cubic feet										
Idaho	249,231	249,092	56,748	43,898	11,994	54,023	37,171	3,536	18,507	23,215	139
Montana	207,289	207,224	68,734	29,428	27,900	4,122	4,939	19,994	49,314	2,793	65
South Dakota (west)	11,235	11,235	0	11,234	1	0	0	--	0	--	--
Wyoming	20,771	20,756	951	3,736	3,038	516	0	12,510	0	5	15
Arizona	65,529	63,981	3,610	53,278	741	2,755	0	0	0	3,597	1,548
Colorado	36,433	34,740	1,452	4,183	15,750	1,161	0	12,189	0	5	1,693
Nevada	846	723	24	246	--	218	--	16	0	219	123
New Mexico	46,259	45,992	6,927	22,802	7,878	1,717	0	0	0	6,668	267
Utah	12,005	11,264	1,174	2,306	3,964	1,739	0	2,066	0	15	741
Total	649,598	645,007	139,620	171,111	71,266	66,251	42,110	50,311	67,821	36,517	4,591

1/ Engelmann, blue, and white spruce.
2/ Grand, white, subalpine, and corkbark firs.
3/ Includes western redcedar, western hemlock, pinyon pine, bristlecone pine, limber pine, whitebark pine, and juniper.

Table 29.--OUTPUT OF TIMBER PRODUCTS IN THE ROCKY MOUNTAIN STATES, BY LAND OWNERSHIP CLASSES, 1962

State	All ownerships	Land ownership class			
		National Forest	Other public	Forest industry[1/]	Other private
	Thousand cubic feet				
Idaho	249,231	120,129	33,646	64,053	31,403
Montana	207,289	115,460	10,572	44,360	36,897
South Dakota (west)	11,235	9,426	56	360	1,393
Wyoming	20,771	18,569	1,225	478	499
Arizona	65,529	45,412	14,154	3,473	2,490
Colorado	36,433	29,620	3,170	401	3,242
Nevada	846	65	24	671	86
New Mexico	46,259	19,891	9,622	--	16,746
Utah	12,005	10,324	228	12	1,441
Total	649,598	368,896	72,697	113,808	94,197

1/ Lands owned by companies or individuals operating wood-using plants.

Table 30.--DISTRIBUTION OF TIMBER PRODUCTS OUTPUT IN THE ROCKY MOUNTAIN STATES, BY PRODUCTS, 1962

State	All products		Saw logs		Veneer logs		Round pulpwood		Commercial poles		Round mine timbers		Miscellaneous industrial wood		Posts, fuelwood miscellaneous farm timbers	
	M cu.ft.	%	M cu.ft.	%	M cu.ft.	%	M cu.ft.	%	M cu.ft.	%	M cu.ft.	%	M cu.ft.	%	M cu.ft.	%
Idaho	249,231	38.4	235,192	41.1	2,797	15.0	4,897	24.0	2,673	55.3	223	7.0	124	4.1	3,325	12.0
Montana	207,289	31.9	182,423	31.9	15,824	85.0	3,781	18.5	966	20.0	271	8.6	281	9.4	3,743	13.6
South Dakota (west)	11,235	1.7	6,493	1.2	--	--	3,060	15.0	548	11.4	--	--	--	--	1,134	4.1
Wyoming	20,771	3.2	19,617	3.4	--	--	464	2.3	--	--	54	1.7	39	1.3	597	2.2
Arizona	65,529	10.1	49,555	8.6	--	--	7,947	38.9	125	2.6	556	17.6	389	13.0	6,957	25.2
Colorado	36,433	5.6	31,563	5.5	--	--	257	1.3	482	9.9	1,411	44.5	1,316	44.0	1,404	5.1
Nevada	846	.1	407	.1	--	--	--	--	--	--	--	--	53	1.8	386	1.4
New Mexico	46,259	7.1	35,905	6.3	--	--	--	--	33	.7	410	12.9	91	3.0	9,820	35.6
Utah	12,005	1.9	10,845	1.9	--	--	--	--	4	.1	245	7.7	699	23.4	212	.8
Total	649,598	100.0	572,000	100.0	18,621	100.0	20,406	100.0	4,831	100.0	3,170	100.0	2,992	100.0	27,578	100.0

Table 31.--DISTRIBUTION OF TIMBER PRODUCTS OUTPUT, ROCKY MOUNTAIN STATES, BY SELECTED YEARS, 1952-1962

State	1952	1954	1958	1962
	Percent			
Idaho	43.5	43.3	41.1	38.4
Montana	25.9	23.9	26.3	31.9
South Dakota (west)	1.7	1/ 1.5	1/ 3.3	1.7
Wyoming	2.8	2.9	3.2	3.2
Arizona	10.8	10.0	8.9	10.1
Colorado	7.3	6.1	6.7	5.6
Nevada	.1	.8	.9	.1
New Mexico	6.4	9.5	7.7	7.1
Utah	1.5	2.0	1.9	1.9
Total	100.0	100.0	100.0	100.0

1/ Computed from data for entire State; separate data for western South Dakota not available for 1954 and 1958.

Table 32.--GENERAL STATISTICS ON EMPLOYMENT, VALUE ADDED IN MANUFACTURE, AND CAPITAL EXPENDITURES FOR LUMBER AND WOOD PRODUCTS INDUSTRIES (SIC CODE 24), SAWMILLS AND PLANING MILLS (SIC CODE 242), AND ALL MANUFACTURING INDUSTRIES IN THE ROCKY MOUNTAIN STATES, 1958 AND 1963

State	Census Bureau SIC code number	1958 1/ All employees Number	All employees Payroll	Production workers Number	Production workers Wages	Value added by manufacture, adjusted	Capital expenditures, new	1963 2/ All employees Number	All employees Payroll	Production workers Number	Production workers Wages	Value added by manufacture	Capital expenditures, new
			- $1,000 -			- $1,000 -			- $1,000 -			- $1,000 -	
Idaho	24	10,337	47,462	9,339	41,387	66,990	5,958	10,624	53,704	9,661	47,845	89,334	11,780
	242	7,551	33,692	6,899	29,653	47,889	3,338	7,336	37,324	6,759	33,432	62,237	7,816
	All	27,582	126,015	22,149	96,509	255,258	18,409	30,809	162,470	24,373	116,556	365,695	28,140
Montana	24	6,669	29,213	5,868	24,363	47,549	6,756	8,325	41,043	7,426	35,298	67,294	9,256
	242	4,985	21,945	4,415	18,412	36,110	5,014	5,372	26,993	4,765	22,890	43,059	5,552
	All	20,315	94,090	15,762	70,428	196,915	21,693	20,279	108,090	16,009	81,436	234,783	27,960
South Dakota 3/	24	1,040	3,498	879	2,788	4,816	365	700	2,799	600	2,275	4,535	586
	242	756	2,434	656	2,024	3,250	284	377	1,586	343	1,387	2,436	(4/)
	All	12,901	54,786	9,631	37,452	114,256	5,211	13,403	70,670	9,803	48,305	142,230	7,351
Wyoming	24	850	3,262	768	2,890	4,612	529	1,152	4,341	1,038	3,854	7,856	974
	242	667	2,551	604	2,261	3,531	457	755	2,887	688	2,613	5,477	663
	All	6,704	31,173	4,699	22,245	62,558	6,985	6,913	37,919	4,831	25,317	82,978	14,189
Arizona	24	2,831	11,877	2,528	10,014	15,378	1,478	3,136	14,926	2,707	12,433	24,295	2,607
	242	2,073	8,695	1,860	7,492	10,567	1,035	--	--	--	--	--	--
	All	40,850	214,390	29,980	148,325	360,173	27,698	57,339	349,124	38,687	212,187	617,413	49,154
Colorado	24	2,642	9,036	2,294	7,554	12,801	2,691	2,419	9,340	2,131	7,771	15,937	1,650
	242	1,593	5,259	1,414	4,555	7,772	1,818	1,418	5,625	1,283	4,782	8,891	1,068
	All	77,574	390,918	55,084	265,209	781,943	45,833	92,659	591,473	64,159	368,907	1,202,958	68,032
Nevada	24	504	2,310	452	1,984	3,526	91	362	1,967	327	1,647	4,654	297
	242	182	908	165	766	1,541	3	--	--	--	--	--	--
	All	5,034	26,780	3,677	18,868	67,591	5,155	6,965	43,499	4,999	29,415	111,733	8,760
New Mexico	24	1,812	6,161	1,616	5,351	11,559	818	2,226	8,405	1,984	6,994	13,621	1,791
	242	1,220	4,112	1,083	3,540	6,315	553	1,402	5,064	1,275	4,183	8,538	1,178
	All	13,740	58,694	9,795	37,950	114,897	15,423	15,236	81,249	10,091	46,598	170,453	9,491
Utah	24	741	2,473	584	1,895	3,041	653	884	3,482	779	2,893	4,878	664
	242	448	1,332	345	973	1,609	371	458	1,688	425	1,482	2,209	(4/)
	All	37,633	181,040	26,717	120,751	411,785	29,516	53,329	326,371	33,374	181,518	704,629	29,757
Total	24	27,426	115,292	24,328	98,226	170,272	19,339	5/29,828	5/140,007	5/26,653	5/121,010	5/232,404	6/29,605
	242	19,475	80,928	17,441	69,676	118,584	12,873	5/17,118	5/81,167	5/15,538	5/70,769	5/132,847	6/16,277
	All	242,333	1,177,886	177,494	817,737	2,365,376	175,923	296,932	1,770,865	206,326	1,110,239	3,632,872	242,834

1/ Data and terms are as shown in Bureau of the Census publications. See Bibliography item (60).
2/ See (65).
3/ Data for entire State. The Bureau of the Census does not report data separately for western South Dakota. However, more than 90 percent of the State's timber industry occurs in western South Dakota.
4/ Less than $500,000.
5/ Total for all States except Arizona and Nevada.
6/ Total for all States except South Dakota, Arizona, Nevada, and Utah.

BIBLIOGRAPHY[15]

The following publications provide information about timber resources or timber-based industries of individual States:

State	Bibliography list numbers
Arizona	24, 43, 52, 83
Colorado	6, 25, 34, 42, 44, 47, 49, 53
Idaho	14, 16, 32, 34, 73, 74, 78, 79, 80, 81
Montana	1, 3, 4, 5, 16, 17, 29, 30, 31, 34, 46 47, 48, 49, 73, 75, 78, 82
Nevada	51
New Mexico	10, 18, 19, 20, 35, 38, 39, 43, 72, 83
South Dakota (west)	7, 12, 13, 15, 34, 37, 46, 47, 49, 53
Utah	9, 33, 51, 70, 78
Wyoming	8, 32, 34, 37, 45, 47, 49, 53, 70, 74, 78

(1) Adair, Kent T.
1966. A profile of lumber marketing in western Montana. Univ. Mont. Forest and Conserv. Exp. Sta. Bull. 30, 20 pp., illus.

(2) Barger, Roland L., and Herbert O. Fleischer.
1964. New products from low-grade ponderosa pine timber. U.S. Forest Serv. Res. Pap. RM-10, 54 pp., illus.

(3) Bolle, Arnold W.
1960. The timber industry and market for woodlot products in the Upper Flathead Valley. Mont. Bus. Rev. 12(4): 3-11.

(4) _____, William K. Gibson, and Elizabeth Hannum.
1966. The forest products industry in Montana. Univ. Mont. Forest and Conserv. Exp. Sta. Bull. 31, 63 pp., illus.

(5) _____, Robert C. Haring, and William K. Gibson.
1964. The economics of the Montana forest products industry. A report prepared for the Upper Midwest Economic Study at Mont. State Univ., 81 pp., illus.

(6) Brown, Delmer L.
1966. Private and state timber resources: Eagle and Pitkin Counties, Colorado. Colo. State Forest Serv., Timber Res. Inventory Release 7, 17 pp., illus.

(7) Caporaso, A. P.
1964. Forest area and timber volume in western South Dakota. U.S. Forest Serv. Res. Note INT-20, 4 pp., illus.

[15] Publications have been selected as those most relevant to the present and future timber situation in the Mountain States. Those that provide statistics on timber inventory, cut, and products output are the latest that have been published for each State.

(8) Choate, Grover A.
1963. The forests of Wyoming. U.S. Forest Serv. Resource Bull. INT-2, 47 pp., illus.

(9) _____
1965. Forests in Utah. U.S. Forest Serv. Resource Bull. INT-4, 63 pp., illus.

(10) _____
1966. New Mexico's forest resource. U.S. Forest Serv. Resource Bull. INT-5, 60 pp., illus.

(11) Dane, C. W.
1965. Truck, rail, and water movement of western softwood plywood and lumber. Forest Prod. J. 15(2): 91-92.

(12) Fechner, Gilbert H.
1956. A survey of the pulpwood resource in the northern Black Hills. U.S. Forest Serv., Rocky Mountain Forest and Range Exp. Sta., Sta. Pap. 20, 21 pp., illus.

(13) _____
1957. A survey of the pole resource in the northern Black Hills. U.S. Forest Serv., Rocky Mountain Forest and Range Exp. Sta., Sta. Pap. 28, 12 pp., illus.

(14) Frazier, George D.
1960. Small non-industrial forest owners in northern Idaho. Univ. Idaho Agr. Exp. Sta. Bull. 317, 31 pp., illus.

(15) Garhart, John M.
1965. Pulpwood harvesting in the Black Hills of South Dakota. IN: Amer. Pulpwood Assoc. Quart., Jan. 1966: 22-23.

(16) Gedney, Donald R., Carl A. Newport, and Dwight Hair.
1966. Pacific Northwest economic base study for power markets. Vol. 11, Part 6, Forest Industries. Prepared for U.S. Dep. Interior, Bonneville Power Admin. by U.S. Forest Serv. Pacific Northwest Forest and Range Exp. Sta., 174 pp., illus.

(17) Gibson, William K.
1962. Economic analysis of the Montana forest products industry. Master's thesis, Mont. State Univ.

(18) Goode, Rudyard B.
1964. The outlook for expanding New Mexico's forest industries. Bur. Bus. Res., Univ. N. Mex. N. Mex. Stud. in Bus. and Econ. 13, 39 pp., illus.

(19) Gray, James R.
1962. Economics of sawmill operation in New Mexico. N. Mex. State Univ. Agr. Exp. Sta. Bull. 465, 25 pp., illus.

(20) _____
1963. Marketing practices of woodland owners in New Mexico. N. Mex. State Univ. Agr. Exp. Sta. Bull. 473, 21 pp., illus.

(21) Guthrie, John A., and George R. Armstrong.
1961. Western forest industry. An economic outlook. Published for Resources for the Future, Inc., 324 pp., illus. Baltimore: The Johns Hopkins Press.

(22) Hair, Dwight.
1963. The economic importance of timber in the United States. U.S. Dep. Agr. Misc. Pub. 941, 91 pp., illus. Wash., D.C.: U.S. Govt. Printing Office.

(23) Herrington, Roscoe B.
1959. Resource base for expanded markets in the Mountain States. Mont. Forest and Conserv. Exp. Sta., Sch. Forest., Mont. State Univ. Bull. 9, 36 pp., illus.

(24) Hoflich, Harold J., and T. J. McCleneghan.
1963. Arizona's new pulp and paper industry. IN: Ariz. Rev. of Bus. and Public Admin. 12(7-8): 1-8.

(25) Hughes, Jay M.
1962. Pulp- and papermaking opportunities in west central Colorado. U.S. Forest Serv., Rocky Mountain Forest and Range Exp. Sta., Sta. Pap. 73, 48 pp., illus.

(26) Hutchison, S. Blair.
1957. Market prospects for Mountain States timber. U.S. Forest Serv., Intermountain Forest and Range Exp. Sta. Res. Pap. 50, 28 pp., illus.

(27) _____
1959. Production distribution trends and freight rates as they affect Mountain States lumber producers. U.S. Forest Serv., Intermountain Forest and Range Exp. Sta. Res. Pap. 59, 13 pp., illus.

(28) _____
1964. Economic problems in developing and utilizing the lodgepole pine resource. Soc. Amer. Forest. Proc. 1964: 123-125.

(29) _____, and Paul D. Kemp.
1952. Forest resources of Montana. U.S. Dep. Agr. Forest Resource Rep. 5, 76 pp., illus.

(30) _____, and Arthur L. Roe.
1962. Management for commercial timber Clark Fork Unit, Montana. U.S. Forest Serv., Intermountain Forest and Range Exp. Sta. Res. Pap. 65, 29 pp., illus.

(31) _____, and John H. Wikstrom.
1952. Resource factors affecting the feasibility of pulp mills in eastern Montana. U.S. Forest Serv., Northern Rocky Mountain Forest and Range Exp. Sta., Sta. Pap. 34, 35 pp., illus.

(32) _____, and John H. Wikstrom.
1957. Industrial opportunities in the Headwaters Timber Development Unit. U.S. Forest Serv., Intermountain Forest and Range Exp. Sta. Res. Pap. 45, 70 pp., illus.

(33) Hutchison, S. Blair, John H. Wikstrom, Roscoe Burwell Herrington, and Robert E. Benson.
1965. Timber management issues on Utah's North Slope. U.S. Forest Serv. Res. Pap. INT-23, 23 pp., illus.

(34) Jacobson, L. H.
1965. Transporting pulpwood from Intermountain Region to Lake States. IN: Amer. Pulpwood Assoc. Quart., Jan. 1966: 21-23.

(35) Kennedy, Fred H.
1958. Timber resources of New Mexico. IN: N. Mex. Quart., XXVII: (4), 7 pp.

(36) _____
1965. The last frontier of forestry--the Rocky Mountains. Soc. Amer. Forest. Proc. 1964: 2-5.

(37) Landt, E. F.
1961. Forest industries of the Black Hills area South Dakota and Wyoming. U.S. Forest Serv., Rocky Mountain Forest and Range Exp. Sta., Sta. Pap. 60, 14 pp., illus.

(38) Long, Roger B.
1965. Timber-based economic activities in New Mexico, 1947-1962. N. Mex. State Univ. Agr. Exp. Sta. Res. Rep. 105, 14 pp., illus.

(39) _____, and James R. Gray.
1963. Market relationships between timber sellers and initial timber processors in New Mexico. N. Mex. State Univ. Agr. Exp. Sta. Res. Pap. 83, 13 pp., illus.

(40) Miller Freeman Publications.
1965. New mills tie the industry to nation's economic growth. Forest Ind. 92(12): 50-51.

(41) _____
1966. Directory of plywood and veneer producers. Forest Ind. 93(1): 123-200.

(42) Miller, Robert L.
1959. Lumber production in Colorado, 1957. U.S. Forest Serv., Rocky Mountain Forest and Range Exp. Sta. Forest Surv. Release 1, 9 pp., illus.

(43) _____
1964. Lumber production in Arizona and New Mexico, 1960. U.S. Forest Serv. Res. Note RM-29, 8 pp., illus.

(44) _____, and Grover A. Choate.
1964. The forest resource of Colorado. U.S. Forest Serv. Resource Bull. INT-3, 55 pp., illus.

(45) _____, and A. K. Wilson.
1959. Lumber production in Wyoming, 1957. U.S. Forest Serv., Rocky Mountain Forest and Range Exp. Sta. Forest Surv. Release 2, 9 pp., illus.

(46) Nelson, Clarence W.
1963. The timber economy of the ninth district west. Fed. Reserve Bank of Minneapolis. Spec. Res. Rep., 64 pp., illus.

(47) Nordwall, D. S.
1965. Pulpwood potential of the eastern Intermountain Region. IN: Amer. Pulpwood Assoc. Quart., Jan. 1966: 19-20.

(48) Pissot, Henry J., and Harold E. Hanson.
1963. The forest resource of Western Montana. U.S. Forest Serv. Resource Bull. INT-1, 46 pp., illus.

(49) Riedesel, Philip E.
1965. Labor supply and costs in the eastern Intermountain Region. IN: Amer. Pulpwood Assoc. Quart., Jan. 1966: 20-21.

(50) Sherman, Dean F.
1966. Plywood: today-tomorrow. Forest Ind. 93(1): 38-41.

(51) Spencer, John S., Jr.
1964. Forest products output in Utah and Nevada, 1962. U.S. Forest Serv. Res. Pap. INT-12, 10 pp., illus.

(52) _____
1966. Arizona's forests. U.S. Forest Serv. Resource Bull. INT-6, 57 pp., illus.

(53) _____, and Thomas O. Farrenkopf.
1964. Timber products output in Colorado, Wyoming, and western South Dakota, 1962. U.S. Forest Serv. Res. Pap. INT-14, 18 pp., illus.

(54) U.S. Bureau of the Census.
1955. Facts for industry: Lumber production and mill stocks 1953 and 1952. Ser. M13G-03, 11 pp.

(55) _____
1957. 1954 Census of Manufactures: Lumber and timber basic products. Bull. MC-24A, 22 pp.

(56) _____
1958. Facts for industry: Lumber production and mill stocks 1955. Ser. M24T-05, 9 pp.

(57) _____
1959. Facts for industry: Lumber production and mill stocks 1956. Ser. M24T-06, 8 pp.

(58) _____
1959. Facts for industry: Lumber production and mill stocks 1957. Ser. M24T-07, 9 pp.

(59) _____
1961. Current industrial reports: Lumber production and mill stocks 1959 and 1958. Ser. M24T(59)-1, with suppl., 9 pp.

(60) U.S. Bureau of the Census.
1961. U.S. Census of Manufactures: 1958. Vol. II, Industry Statistics, Part 1, Major Groups 20 to 28. Wash., D.C.: U.S. Govt. Printing Office.

(61) _____
1962. Current industrial reports: Lumber production and mill stocks 1960 and 1959. Ser. M24T(60)-1, 9 pp.

(62) _____
1963. Current industrial reports: Lumber production and mill stocks 1962. Ser. M24T(62)-1, 9 pp.

(63) _____
1964. Annual survey of manufactures: 1962. 486 pp. Wash., D.C.: U.S. Govt. Printing Office.

(64) _____
1964. Current industrial reports: Lumber production and mill stocks 1963. Ser. M24T(63)-1, 9 pp.

(65) _____
1965. 1963 Census of Manufactures: Area Series, Preliminary Reps. MC63(P)-S3, S6, S13, S27, S29, S32, S42, S45, and S51.

(66) _____
1966. Current industrial reports: Lumber production and mill stocks 1964. Ser. M24T(64)-1, 8 pp.

(67) _____
1966. Census of transportation, 1963: Commodity transportation survey--commodity groups, part 2, TC63-C3-2.

(68) U.S. Forest Service.
1958. Timber resources for America's future. Forest Resource Rep. 14, 713 pp., illus. Wash., D.C.: U.S. Govt. Printing Office.

(69) _____
1958. Time for action in the woods. 44 pp., illus. U.S. Forest Serv., Reg. 3, Albuquerque, N. Mex.

(70) _____
1964. Green River pulpmill opportunities. 19 pp., illus. U.S. Forest Serv., Reg. 4, Ogden, Utah.

(71) _____
1965. Timber trends in the United States. Forest Resource Rep. 17, 235 pp., illus. Wash., D.C.: U.S. Govt. Printing Office.

(72) _____, Bureau of Business Research, University of New Mexico, and New Mexico Department of State Forestry.
1966. Pulp and papermaking opportunities in northern New Mexico. 35 pp., illus. U.S. Forest Serv., Reg. 3, Albuquerque, N. Mex.

(73) U.S. Public Health Service.
1955. Summary report on pulp mill sites in relation to mill effluent effects on water quality in streams in western Montana and northern Idaho. Dep. Health, Education, and Welfare, Wash., D.C.

(74) _____
1957. Report on sites for potential pulpmills in the Snake and Green River Basins in relation to water supply and disposal of wastes. Dep. Health, Education, and Welfare. Cincinnati: Robert A. Taft Sanitary Eng. Center. (This report is summarized in Res. Note 43, Suitable sulphate chemical pulpmill sites in southern Idaho and western Wyoming from the standpoint of waste disposal, U.S. Forest Serv., Intermountain Forest and Range Exp. Sta., Ogden, Utah.)

(75) U.S. Senate.
1959. Full use and development of Montana's timber resources. A survey prepared for the Montana delegation. Eighty-sixth Congr., First Sess., Doc. 9, 35 pp., illus.

(76) Wikstrom, John H.
1957. Lodgepole pine, a lumber species. U.S. Forest Serv., Intermountain Forest and Range Exp. Sta. Res. Pap. 46, 15 pp., illus.

(77) _____
1958. The market outlook for lodgepole pine. J. Forest. 56(9): 643-646.

(78) _____, and Charles A. Wellner.
1961. The opportunity to thin and prune in the Northern Rocky Mountain and Intermountain Regions. U.S. Forest Serv., Intermountain Forest and Range Exp. Sta. Res. Pap. 61, 14 pp., illus.

(79) Williams, E. L.
1964. The sawmilling industry of northern Idaho. Univ. Idaho Agr. Exp. Sta. Bull. 430, 12 pp., illus.

(80) Wilson, Alvin K.
1962. The timber resources of Idaho. U.S. Forest Serv., Intermountain Forest and Range Exp. Sta. Forest Surv. Release 3, 42 pp., illus.

(81) _____
1964. Output of timber products in Idaho, 1962. U.S. Forest Serv. Res. Pap. INT-13, 10 pp., illus.

(82) _____
1964. Output of timber products in Montana, 1962. U.S. Forest Serv. Res. Pap. INT-11, 10 pp., illus.

(83) _____
1964. Timber products output in Arizona and New Mexico, 1962. U.S. Forest Serv. Res. Pap. INT-15, 8 pp., illus.

APPENDIX

TERMINOLOGY

Forest Land

The term forest land includes (a) land that is at least 10-percent stocked by trees of any size and capable of producing timber or other wood products, or of exerting an influence on the climate or on the water regime; (b) land from which the trees described in (a) have been removed to less than 10-percent stocking, and which has not been developed for other use; (c) afforested areas.

At the time the fieldwork for this report was performed, the minimum unit of area for forest land classification was 10 acres with a minimum width of stringer strips of 120 feet.

The principal classes of forest land are:

Commercial forest land.--Forest land which is (a) producing, or physically capable of producing, usable crops of wood (usually sawtimber); (b) economically available now or prospectively; (c) not withdrawn from timber utilization.

Noncommercial forest land.--Three classes of noncommercial forest land are recognized: Productive-reserved, Unproductive-nonreserved, and Unproductive-reserved.

Productive-reserved is public forest land withdrawn from timber utilization through statute, ordinance, or administrative order, but which otherwise qualifies as commercial forest land.

Unproductive indicates forest land incapable of yielding usable wood products (usually sawtimber) because of adverse site conditions, or forest land so physically inaccessible as to be unavailable economically in the foreseeable future.

Forest Types

Forest land is classified into types on the basis of tree species; the type name is that of the predominant species. The predominant species is the one which has a plurality of (a) gross cubic volume in sawtimber and poletimber stands or (b) the number of stems in seedling and sapling stands. Both growing stock and cull trees are considered in the classification. The following forest types occur on both commercial and noncommercial forest land:

Douglas-fir
Ponderosa pine
Western white pine
Lodgepole pine
Whitebark, limber, and bristlecone pines
Fir-spruce
Hemlock
Western redcedar
Western larch
Aspen
Cottonwood
Other western hardwoods

Additional forest types occur only on noncommercial forest land:

Pinyon-juniper
Chaparral
Other (unclassified)

Tree-Size Classes

Sawtimber-size tree

A tree 9.0 inches d.b.h. or larger for softwoods and 11.0 inches d.b.h. or larger for hardwoods.

Pole-size tree

A tree 5.0 to 8.9 inches d.b.h. for softwoods and 5.0 to 10.9 inches d.b.h. for hardwoods.

Seedling and sapling trees

Trees at least 1 foot high and less than 5.0 inches d.b.h.

Tree-Merchantability Classes

Sawtimber tree

Live tree of commercial species, 9.0 inches d.b.h. or larger for softwoods and 11.0 inches d.b.h. or larger for hardwoods, that contains at least one saw log. At least one-third of the board-foot volume must be free from rot or other defect.

Poletimber tree

Live tree of commercial species, 5.0 to 8.9 inches d.b.h. for softwoods and 5.0 to 10.9 inches d.b.h. for hardwoods, free of rot and having the likelihood of growing into a sawtimber tree.

Growing stock trees

Sawtimber trees, poletimber trees, saplings, and seedlings; i.e., all live trees except cull trees.

In discussion and tables on volumes, growth, and mortality, the term growing stock refers only to sawtimber trees and poletimber trees; i.e., all live trees 5 inches d.b.h. and larger (except cull trees). Saplings and seedlings are not part of growing stock in this use of the term.

Cull tree

Live tree of sawtimber or poletimber size that is unmerchantable for saw logs, now or prospectively, because of rot or other defect, or species.

Sound cull trees include:

a. Sawtimber-size trees that have more than two-thirds of their gross board-foot volume in cull with at least one-half of this cull the result of sweep, crook, or other sound defect. Also included are sound trees which do not contain at least one saw log.

b. Poletimber-size trees that are unlikely to grow into sawtimber trees because of serious fire and basal scars, broken tops, severe mistletoe, crooks, or girdling by porcupine. No rot may be present.

Rotten cull trees include:

a. Sawtimber-size trees that have more than two-thirds of their gross board-foot volume in cull, with more than half of the cull due to rot.

b. Poletimber-size trees showing any evidence of rot in the main stem.

Stand-Size Classes

Sawtimber stands

Stands at least 10-percent stocked with growing stock trees, with half or more of the total stocking in sawtimber or poletimber trees and with sawtimber stocking at least equal to poletimber stocking.

Old-growth sawtimber

A sawtimber stand in which 50 percent or more of the net board-foot volume is in trees of rotation age or older.

Young-growth sawtimber

A sawtimber stand in which 50 percent or more of the net board-foot volume is in trees under rotation age.

Poletimber stands

Stands at least 10-percent stocked with growing stock trees, of which half or more of the stocking is sawtimber and/or poletimber trees with poletimber stocking exceeding that of sawtimber.

Seedling-sapling stands

Stands at least 10-percent stocked with growing stock trees of which more than half are saplings and/or seedlings (trees less than 5.0 inches d.b.h.).

Nonstocked area

Commercial forest land less than 10-percent stocked with growing stock trees.

Timber Volume

All-timber volume

Volume in cubic feet of sound wood in the bole of growing stock, cull, and salvable dead trees 5.0 inches and larger in diameter at breast height, from stump to a minimum 4.0-inch top inside bark.

Growing stock volume

Net volume in cubic feet of sawtimber trees and poletimber trees from stump to a minimum 4.0-inch top inside bark.

Live sawtimber volume

Net volume in board feet, international $\frac{1}{4}$-inch rule, of the saw log portion of sawtimber trees.

Saw log portion

That portion of the bole of sawtimber trees between the stump and the merchantable top.

Merchantable top

The point at which the upper limit of saw log merchantability is limited either by limbs or by a minimum diameter. The latter ranges from 5 to 10 inches inside bark depending on d.b.h., species, and regional utilization standards.

Upper-stem portion

That part of the bole of sawtimber trees above the merchantable top to a minimum top diameter of 4.0 inches inside bark.

Growth

Net annual growth of sawtimber or growing stock

The average annual change, calculated from the total change over a 10-year period, in net board-foot or cubic-foot volume of live sawtimber or growing stock on commercial forest land.

Mortality

Net annual mortality of sawtimber or growing stock

The average annual net board-foot or cubic-foot volume removed from live sawtimber or growing stock through death, calculated from the total net volume removed by such causes over a 10-year period.

Timber Cut

Timber cut from growing stock

The volume of sound wood in live sawtimber and poletimber trees cut for forest products during a specified period, including both roundwood products and logging residues.

Timber cut from sawtimber

The net board-foot volume of live sawtimber trees cut for forest products during a specified period, including both roundwood products and logging residues.

Logging residues from growing stock

The net cubic-foot volume of live sawtimber and poletimber trees cut or killed by logging on commercial forest land and not converted to timber products.

Ownership Classes

National Forest lands

Federal lands which have been designated by Executive order or statute as National Forests or purchase units, and other lands under the administration of the United States Forest Service, including experimental areas and Bankhead-Jones Title III lands.

Other Federal lands

Federal lands other than National Forests, including lands administered by the Bureau of Land Management, Bureau of Indian Affairs, and miscellaneous Federal agencies.

State, county, and municipal lands

Lands owned by States, counties, and local public agencies, or lands leased by these governmental units for more than 50 years.

Forest industry lands

Lands owned by companies or individuals operating wood-using plants.

Farmer-owned lands

Lands owned by operators of farms.

Miscellaneous private lands

Privately owned lands other than forest-industry or farmer-owned lands.

Principal Tree Species

Softwoods

Douglas-fir	Pseudotsuga menziesii
Fir, subalpine	Abies lasiocarpa
Fir, corkbark	A. lasiocarpa var. arizonica
Fir, grand	A. grandis
Fir, white	A. concolor
Hemlock, mountain	Tsuga mertensiana
Hemlock, western	T. heterophylla
Juniper	Juniperus spp.
Larch, alpine	Larix lyallii
Larch, western	L. occidentalis
Pine, bristlecone	Pinus aristata
Pine, limber	P. flexilis
Pine, lodgepole	P. contorta
Pine, ponderosa	P. ponderosa
Pine, western white	P. monticola
Pine, whitebark	P. albicaulis
Pine, pinyon	P. spp.
Redcedar, western	Thuja plicata
Spruce, Engelmann	Picea engelmannii
Spruce, blue	P. pungens
Spruce, white	P. glauca

Hardwoods

Aspen, quaking	Populus tremuloides
Cottonwood	P. spp.
Birch, paper	Betula papyrifera

Maps

of

MAJOR TIMBER INDUSTRIES AND COMMERCIAL FOREST LAND

in the

ROCKY MOUNTAIN STATES

and

SAW LOG OUTPUT BY COUNTIES, 1962,

ROCKY MOUNTAIN STATES

MAJOR TIMBER INDUSTRIES AND COMMERCIAL FOREST LAND

IN THE

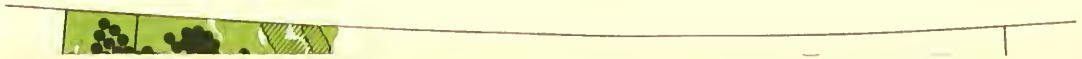
ROCKY MOUNTAIN STATES

FOREST SURVEY • INTERMOUNTAIN FOREST AND RANGE EXPERIMENT STATION

AND

ROCKY MOUNTAIN FOREST AND RANGE EXPERIMENT STATION

U.S. DEPARTMENT OF AGRICULTURE • FOREST SERVICE



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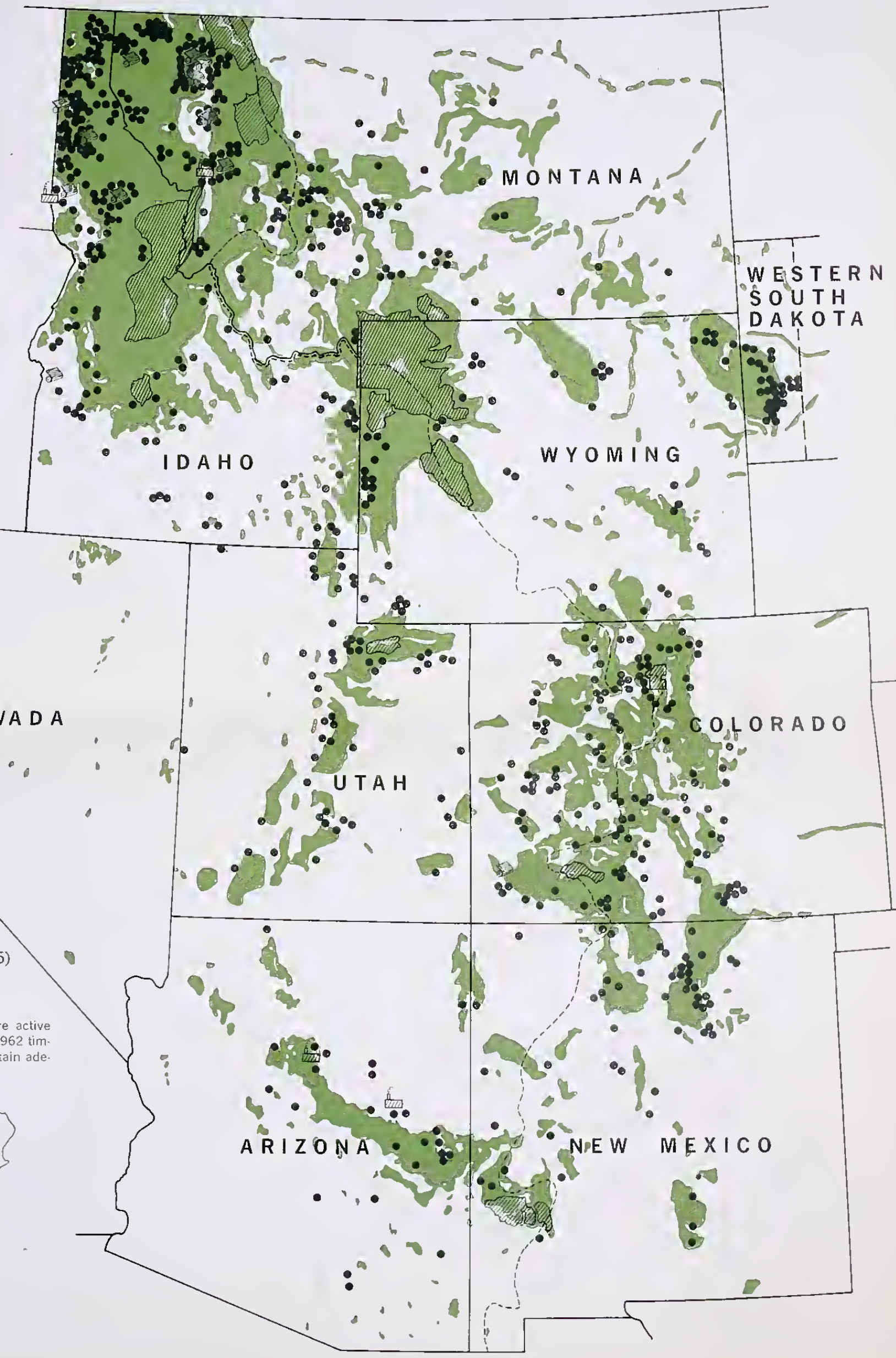

COMMERCIAL FOREST LAND

MAJOR AREAS RESERVED FROM TIMBER CUTTING

SAWMILL (as of 1962)[1]

PULPMILL (as of 1965)

PLYWOOD OR VENEER PLANT (as of 1965)

---- CONTINENTAL DIVIDE

[1] In addition to the plotted sawmills, there were active sawmills that either did not furnish a report in the 1962 timber products survey, or whose report did not contain adequate information for locating on the map.

SAW LOG OUTPUT BY COUNTIES, 1962

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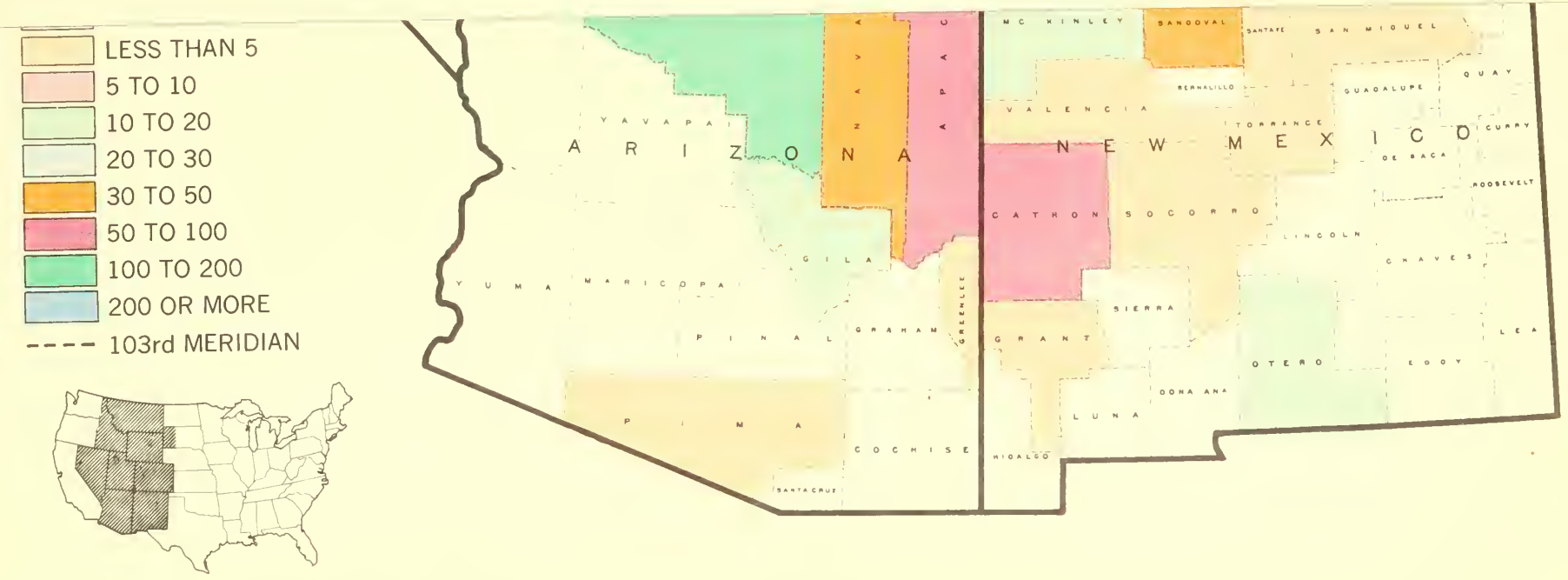

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SAW LOG OUTPUT BY COUNTIES, 1962

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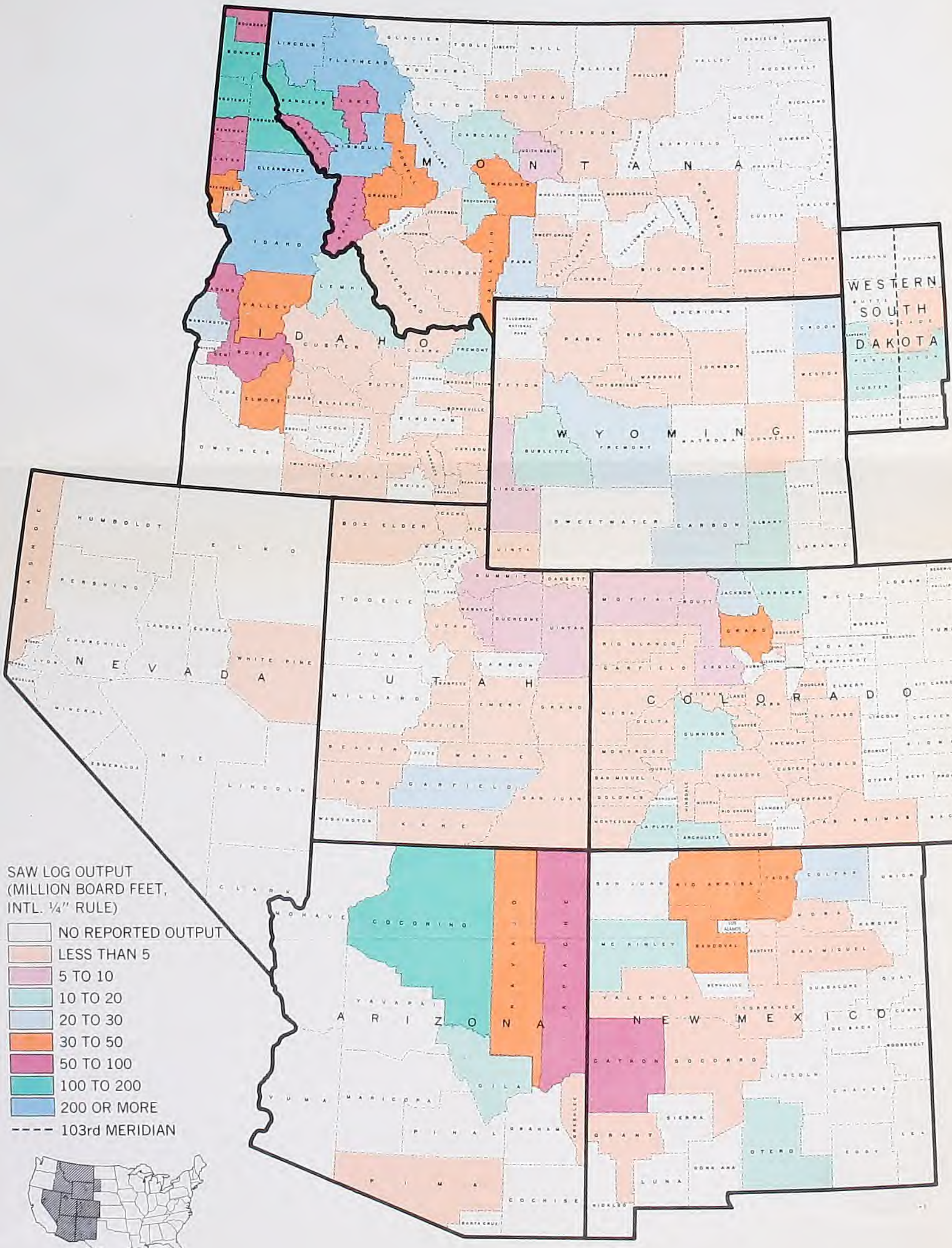

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