



# Wyoming's Forest Products Industry and Timber Harvest, 2018



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## Abstract

This report traces the flow of Wyoming's 2018 timber harvest through the primary wood products industry and characterizes the structure, capacity, and condition of Wyoming's forest products sector. Trends in timber harvest, production, sawmill capacity, mill residuals, and sales value are presented. Employment and worker earnings in the State's primary and secondary forest products industries are also discussed. Periodic survey data collected from the forest products industry provides detailed information on Wyoming's timber resources, wood utilization, and the economic contributions of the industry to the State economy.

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**Keywords:** forest economics, lumber production, mill residue, mill capacity, wood products, timber harvest, timber-processing facility, wood utilization.

### Cover:

Upper left—Ponderosa pine log entering headsaw. Upper right—Decked pine logs in Wyoming mill yard. Center left—Post and pole processing sort yard. Center right— Finished wooden dowels stacked for shipping. Bottom—Raw logs and rough cut cants stacked outside mill. Courtesy photos by the Bureau of Business and Economic Research (BBER).

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## HIGHLIGHTS

- A total of 30 primary wood-processing facilities operated in 15 Wyoming counties during 2018. These facilities included 12 sawmills, 12 post and pole producers, 2 log home manufacturers, 1 log furniture manufacturer, and 3 other wood products facilities.
- The sales value of wood products from Wyoming producers fell from more than \$66 million in 2014 to \$63 million in 2018 (2018 dollars), a drop of close to 5 percent. Lumber and sawn products accounted for \$57 million, pulp and paper products brought in \$3.8 million, sales of house logs and log homes accounted for \$152,000, and sales of other wood products were nearly \$2.3 million in 2018.
- Wyoming's 2018 timber harvest volume was 81.6 million board feet (MMBF) Scribner, with 67 percent of the timber coming from National Forests, 27 percent from private lands, 3 percent from State-owned lands, and just under 3 percent from BLM lands.
- Crook, Carbon, and Albany were the leading timber harvest counties in Wyoming during 2018, accounting for 49, 14, and 11 percent of the total harvest, respectively.
- Estimated annual capacity to process timber in Wyoming during 2018 was 116 MMBF, Scribner. Wood-processing facilities in the State used about 70 percent of their processing capacity in 2018, processing 80.7 MMBF of timber.
- Ponderosa pine was Wyoming's most harvested species in 2018, accounting for nearly 41 MMBF (50 percent) of the total harvest. This was followed by lodgepole pine with 28 percent (23 MMBF) and Englemann/Black Hills spruce with 11 percent (9 MMBF).
- Thirty-five percent of the more than 78 MMBF Scribner received by Wyoming mills during 2018 came from outside the State, while 37 percent of the nearly 82 MMBF of timber harvested in Wyoming was shipped outside the State.
- The forest products industry in Wyoming produced 142,710 bone dry units (BDU) of residue in 2018, 97 percent of which was utilized for pulp, board, and other products, and for energy.
- In 2018, the Wyoming forest industry directly supported 952 full- and part-time jobs, with combined labor income of \$41.4 million.

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# INTRODUCTION

This report contains the findings from a periodic census of Wyoming's primary forest products industry for calendar year 2018. It presents a discussion of trends since the previous census in 2014 and describes developments since 2018. The report's principal goals are to determine the utilization of Wyoming's timber harvest, identify the type and number of primary forest products firms operating during 2018 and their sources of raw material, and quantify outputs of finished products. Data on subsequent years are provided where available.

The University of Montana's Bureau of Business and Economic Research (BBER) and the USDA, Forest Service, Rocky Mountain Research Station (Ogden, Utah) cooperated in the analysis and preparation of this report. BBER, in cooperation with the Forest Inventory and Analysis (FIA) programs at the Rocky Mountain and Pacific Northwest Research Stations, has developed a system to collect, compile, and make available State and county information on the operations of the forest products industry—the Forest Industries Data Collection System (FIDACS). This is the sixth application of this system in Wyoming.

## Forest Industries Data Collection System

FIDACS is based on a census of primary forest product manufacturers located in a particular State and facilities in surrounding States that receive timber harvested from that State. Primary forest product manufacturers are firms that process timber into manufactured products such as lumber, and facilities like wood pellet plants, that use the wood fiber residue directly from timber processors. Wyoming's primary forest products manufacturers were identified through telephone directories and with the assistance of the manufacturers themselves. Through a written questionnaire or telephone interview, manufacturers provided the following detailed information for each facility operating during calendar year 2018:

- Plant location, production capacity, and employment.
- Volume of raw material received, by county and ownership.
- Species of timber received and live/dead proportions.
- Preferred and accepted log lengths and diameters.
- Finished product volumes, types, sales value, and market locations.
- Utilization and marketing of manufacturing residue.

Facilities participating in the 2018 Wyoming census processed virtually all of the State's commercial timber harvest. Volumes and characteristics of Wyoming timber processed by out-of-state firms were determined by surveying facilities in nearby States including Montana, Idaho, South Dakota, and Utah. A variety of publications and information provided by Federal, State, and industry managers were used to verify estimates of Wyoming's total timber harvest and wood products production and sales.

Information collected through FIDACS is stored at the University of Montana's BBER. Because of the substantial detail on the industry and its timber use, there is a time lag between the date of the census and the publication of this report. To make the data available in a more timely fashion, results and a summary are posted online as they are compiled and reviewed ([https://www.bber.umt.edu/FIR/S\\_WY.asp](https://www.bber.umt.edu/FIR/S_WY.asp)). Key data from other

sources are included to provide the most recent measurers of general industry activity, and references to other publications dealing with industry conditions are included. Additional information is available by request. However, individual firm-level data are confidential and will not be released.

## WYOMING’S TIMBER RESOURCE

Wyoming contains approximately 5.5 million acres of “nonreserved timberland”—lands not permanently reserved through statute or administrative designation such as Wilderness Areas, National Parks, and National Monuments. The majority (71 percent) of nonreserved timberland in Wyoming is National Forest System (NFS) land managed by the USDA Forest Service (USDA FIA 2020) (table 1). Likewise, the majority (83 percent) of sawtimber tree volume is found on NFS lands (fig. 1).

By comparison, NFS lands provided 67 percent of the 2018 harvest, while private and tribal landowners provided 27 percent and other public sources provided the remaining 6 percent.

Available sawtimber volume on Wyoming’s nonreserved timberland is approximately 28.7 billion board feet Scribner (fig. 1). The greatest portion of this volume (83 percent, or 23.8 billion board feet) is on NFS land, while 10 percent (2.8 billion board feet) is located on private land and the remaining 7 percent (2.1 billion board feet) is on other public lands. Net annual growth of sawtimber on nonreserved timberland is approximately -421 million board feet (MMBF) per year; mortality, primarily from insect outbreaks, greatly exceeds growth.

## WYOMING’S TIMBER HARVEST

Timber harvested from lands in Wyoming in 2018 totaled 81.6 MMBF, or close to 19 million cubic feet (MMCF). This constitutes a 21 percent increase over the 2014 harvest of 67.5 MMBF and a near doubling over the 2010 harvest of 41.7 MMBF (fig. 2). The strong rebound in Wyoming’s harvest can be explained in part by economic forces affecting wood products markets over the past two decades. The Great Recession and associated drop in U.S. home construction during the period between 2007 and 2009 greatly reduced the demand for lumber through 2010 and 2011 (Keegan et al. 2012).

**Table 1**—Wyoming timberland by ownership class.

| Ownership class           | Thousand acres | Percent of timberland |
|---------------------------|----------------|-----------------------|
| National Forest           | 3,893          | 71.0                  |
| Non-industrial private    | 977            | 17.8                  |
| Industrial                | —              | —                     |
| Bureau of Land Management | 367            | 6.7                   |
| State                     | 241            | 4.4                   |
| Other public              | 2              | 0.0                   |
| All owners <sup>a</sup>   | 5,480          | 100                   |

Source: USDA FIA 2020.

<sup>a</sup>Percentage detail may not sum to 100 percent due to rounding.



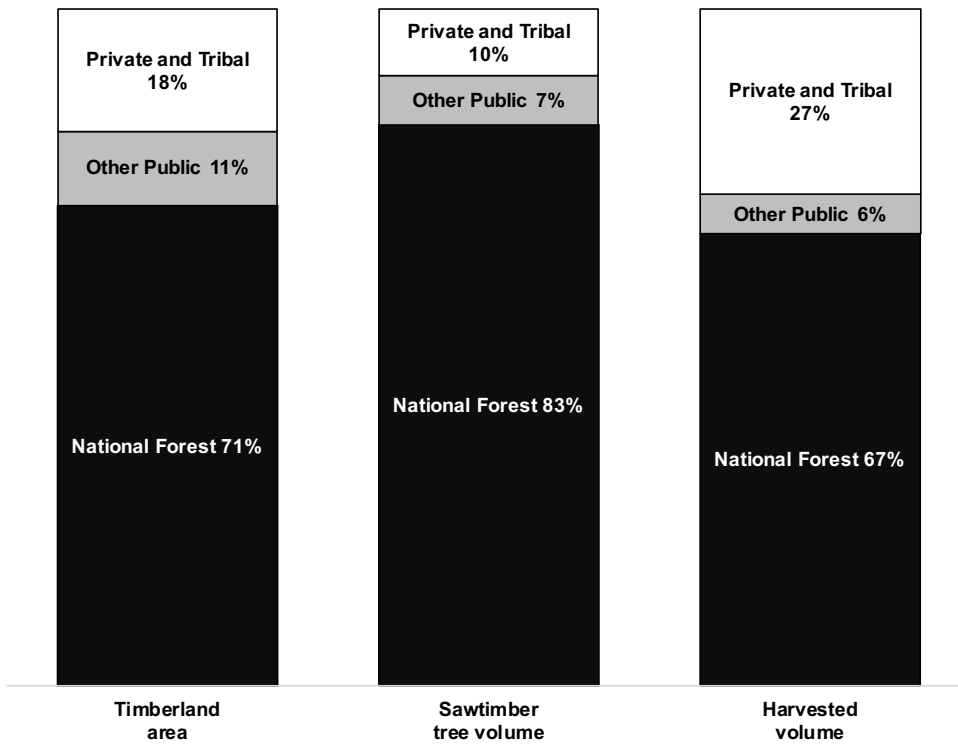


Figure 1—Characteristics of Wyoming’s timberland by ownership class, 2018.

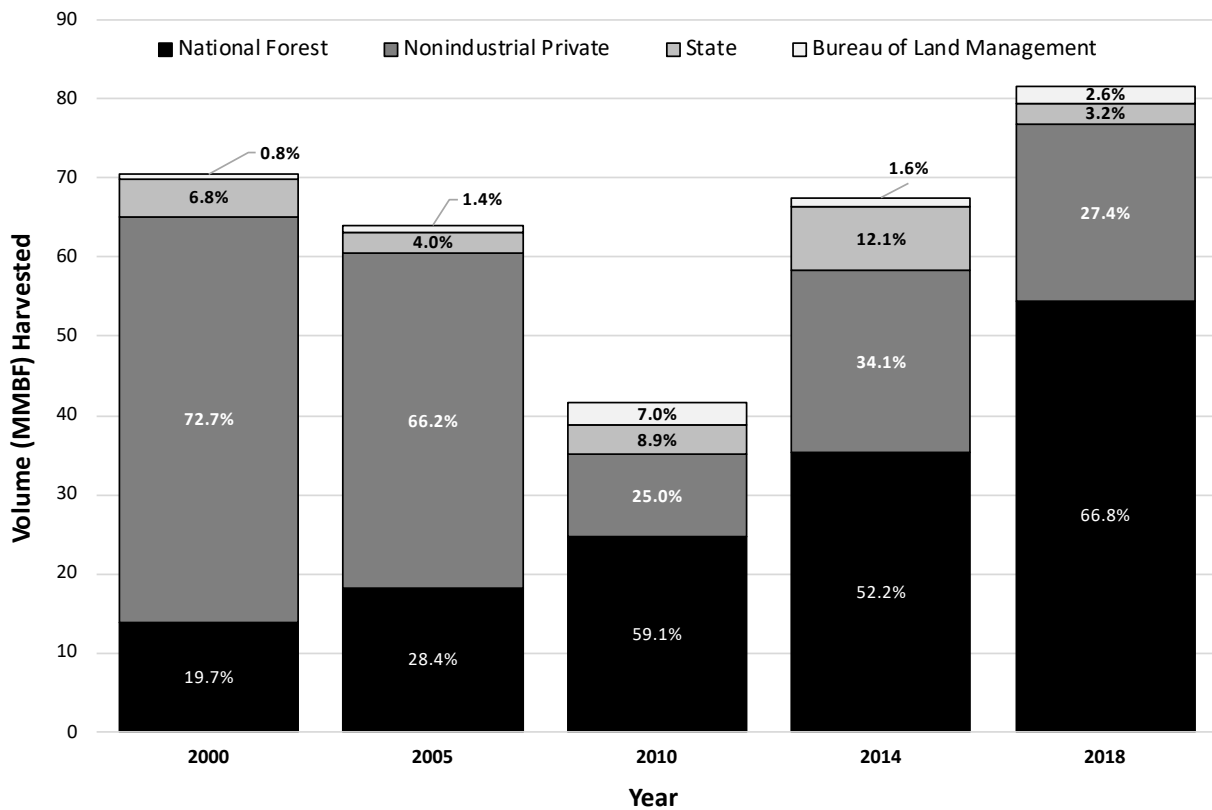


Figure 2—Wyoming timber harvest by ownership, selected years (sources: Brandt et al. 2009; McIver et al. 2018; Morgan et al. 2005).

Since 2011, increases in home construction, as well as overseas demand, has led to improved markets for wood products. Aside from market influences, landowner decisions to increase or decrease harvest levels in response to disturbance (e.g., fire, insects, and disease), or in an effort to proactively manage their forests for other resource values (e.g., restoration, wildlife, or fire hazard reduction), can affect the amount of timber being offered, sold, and cut each year. In Wyoming, the different ownership classes saw great variation in harvest changes between 2014 and 2018: National Forest lands increased by 55 percent, whereas other public lands went down by 49 percent and private lands went down by 3 percent (table 2).

**Table 2a**—Wyoming timber harvest, thousand board feet Scribner, by ownership class, selected years.

| Ownership class                           | 2000   | 2005   | 2010   | 2014   | 2018   |
|---|--------|--------|--------|--------|--------|
| ----- Thousand board feet, Scribner ----- |        |        |        |        |        |
| National Forest                           | 13,861 | 18,189 | 24,621 | 35,260 | 54,525 |
| Non-industrial Private                    | 51,252 | 42,380 | 10,415 | 23,016 | 22,328 |
| State                                     | 4,785  | 2,565  | 3,720  | 8,180  | 2,611  |
| Bureau of Land Management                 | 596    | 903    | 2,939  | 1,091  | 2,157  |
| All owners                                | 70,494 | 64,037 | 41,695 | 67,547 | 81,621 |

**Table 2b**—Wyoming timber harvest by ownership class, selected years.

| Ownership class                | 2000 | 2005 | 2010 | 2014 | 2018 |
|--------------------------------|------|------|------|------|------|
| ----- Percent of harvest ----- |      |      |      |      |      |
| National Forest                | 19.7 | 28.4 | 59.1 | 52.2 | 66.8 |
| Non-industrial Private         | 72.7 | 66.2 | 25.0 | 34.1 | 27.4 |
| State                          | 6.8  | 4.0  | 8.9  | 12.1 | 3.2  |
| Bureau of Land Management      | 0.8  | 1.4  | 7.0  | 1.6  | 2.6  |
| All owners <sup>a</sup>        | 100  | 100  | 100  | 100  | 100  |

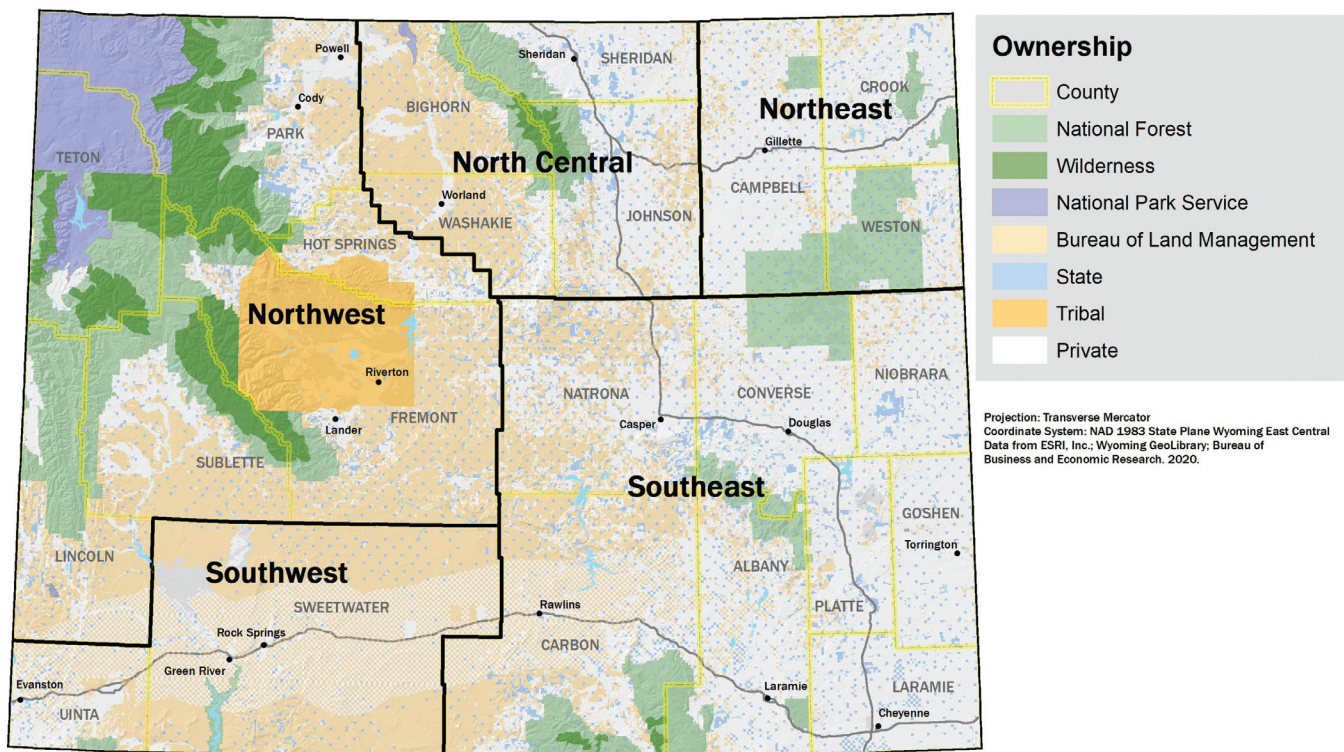
Sources: Brandt et al. 2009; McIver et al. 2018; Morgan et al. 2005.

<sup>a</sup>Percentage detail may not sum to 100 percent due to rounding.

## Harvest by Geographic Source

The geographic source of Wyoming’s timber harvest has been from the mountainous regions of the State, where sufficient moisture allows timber to achieve a merchantable size (Green and Conner 1989). Wyoming’s timber harvest was divided among five resource areas for 2018: Northeast, North Central, Northwest, Southeast, and Southwest (fig. 3).

The Northeast resource area includes Campbell, Crook, and Weston counties and accounted for 51 percent (41.6 MMBF) of Wyoming’s 2018 timber harvest (table 3), the majority (40 MMBF or 49 percent of total State harvest) from Crook County. The Southeast resource area accounted for 25 percent (20.2 MMBF) and includes Albany, Carbon, Converse, Goshen, Laramie, Natrona, Niobrara, and Platte counties. Only Albany



**Figure 3**—Wyoming’s geographic resource areas.

and Carbon counties yielded a timber harvest. The Northwest resource area provided 12 percent (9.4 MMBF) and includes Fremont, Hot Springs, Lincoln, Park, Sublette, and Teton counties. The North Central resource area includes Big Horn, Johnson, Sheridan, and Washakie counties and was the origin of 7 percent (5.9 MMBF) of Wyoming’s timber harvest, while 5 percent (4.4 MMBF) of the harvest originated in the Southwest resource area, which includes the counties of Sweetwater and Uinta. Timber from the Northeast, North Central, and Southeast resource areas was harvested primarily on National Forest lands, whereas timber from the Northwest and Southwest was harvested mostly on private lands. Two-thirds of Wyoming counties had at least some timber harvest in 2018.

## Harvest by Product Type

Wyoming’s timber harvest falls into three general product categories: sawlogs, posts and small poles, and other products. Sawlogs are timber sawn to produce lumber, mine timbers, and other sawn products. Posts and small poles are timber used to manufacture fence posts, small poles, and rails used in fence construction. Other products include timber used to manufacture house logs, log furniture, and firewood.

The product shares of the Wyoming harvest have been changing over the years, although the changes have been less significant in the last decade. During 2018, sawlogs were the primary timber product harvested in Wyoming, accounting for 95 percent (77.4 MMBF) of the total harvest (table 4). Post and small poles accounted for less than 3 percent (2.1 MMBF) of the total 2018 harvest, as did house logs and other products.

**Table 3**—Wyoming timber harvest, thousand board feet Scribner, by county and ownership, 2018.

| Resource area             | National Forest | Private | State | BLM   | Total  | Percent of total |
|---------------------------|-----------------|---------|-------|-------|--------|------------------|
| Northeast Wyoming         | 27,543          | 12,512  | 1,414 | 100   | 41,569 | 50.9             |
| Campbell                  | —               | —       | —     | —     | —      | —                |
| Crook                     | 27,543          | 11,155  | 1,283 | —     | 39,981 | 49.0             |
| Weston                    | —               | 1,357   | 131   | 100   | 1,588  | 1.9              |
| North Central Wyoming     | 4,613           | 970     | 367   | —     | 5,950  | 7.3              |
| Big Horn                  | 1,609           | 12      | —     | —     | 1,729  | 2.1              |
| Johnson                   | 15              | 755     | 242   | —     | 1,012  | 1.2              |
| Sheridan                  | 2,345           | —       | 125   | —     | 2,470  | 3.0              |
| Washakie                  | 644             | 95      | —     | —     | 739    | 0.9              |
| Northwest Wyoming         | 4,356           | 4,785   | 300   | 5     | 9,446  | 11.6             |
| Fremont                   | 8               | 29      | —     | 5     | 42     | 0.1              |
| Hot Springs               | —               | 25      | 300   | —     | 325    | 0.4              |
| Lincoln                   | 351             | 3,961   | —     | —     | 4,312  | 5.3              |
| Park                      | 3,235           | 18      | —     | —     | 3,253  | 4.0              |
| Sublette                  | 679             | 752     | —     | —     | 1,431  | 1.8              |
| Teton                     | 83              | —       | —     | —     | 83     | 0.1              |
| Southeast Wyoming         | 17,673          | 51      | 530   | 2,000 | 20,254 | 24.8             |
| Albany                    | 8,894           | 22      | 4     | —     | 8,920  | 10.9             |
| Carbon                    | 8,779           | —       | 500   | 2,000 | 11,279 | 13.8             |
| Converse                  | —               | 18      | 15    | —     | 33     | 0.0              |
| Goshen                    | —               | —       | —     | —     | —      | —                |
| Laramie                   | —               | —       | —     | —     | —      | —                |
| Natrona                   | —               | 11      | 11    | —     | 22     | 0.0              |
| Niobrara                  | —               | —       | —     | —     | —      | —                |
| Platte                    | —               | —       | —     | —     | —      | —                |
| Southwest Wyoming         | 340             | 4,010   | —     | 52    | 4,402  | 5.4              |
| Sweetwater                | —               | —       | —     | —     | —      | —                |
| Uinta                     | 340             | 4,010   | —     | 52    | 4,402  | 5.4              |
| All counties <sup>a</sup> | 54,525          | 22,328  | 2,611 | 2,157 | 81,621 | 100              |

<sup>a</sup>Percentage detail may not sum to 100 percent due to rounding.

## Harvest by Species

As in previous years, ponderosa pine and lodgepole pine were Wyoming's most harvested species; however, the species composition of the State's sawlog harvest has shifted from predominantly lodgepole pine (73 percent in 1969) to a distribution with an increasing component of ponderosa pine (73 percent in 2005) (tables 5, 6, and 7). In 2018, ponderosa pine constituted 53 percent of the sawlog harvest, while lodgepole pine constituted 24 percent. Both spruces and firs made up close to 11 percent each, with other species making up less than 1 percent. Harvest volume of spruce increased by more than 17 percent between 2014 and 2018 (from 1.6 MMCF to 1.9 MMCF).

**Table 4**—Wyoming timber harvest volume by ownership source and product type, 2018.

| Ownership source                                 | Sawlogs | Post and pole | Other products <sup>a</sup> | All products |
|--|---------|---------------|-----------------------------|--------------|
| ----- <i>Thousand board feet, Scribner</i> ----- |         |               |                             |              |
| Private timberlands                              | 21,181  | 368           | 779                         | 22,328       |
| Industrial                                       | —       | —             | —                           | —            |
| Non-industrial                                   | 21,181  | 368           | 779                         | 22,328       |
| Public timberlands                               | 56,240  | 1,724         | 1,329                       | 59,293       |
| National Forests                                 | 52,121  | 1,447         | 957                         | 54,525       |
| Other public <sup>b</sup>                        | 4,119   | 277           | 372                         | 4,768        |
| Total  | 77,421  | 2,092         | 2,108                       | 81,621       |
| ----- <i>Percent of harvest</i> -----            |         |               |                             |              |
| Private timberlands                              | 27.4    | 17.6          | 37.0                        | 27.4         |
| Industrial                                       | —       | —             | —                           | —            |
| Non-industrial                                   | 27.4    | 17.6          | 37.0                        | 27.4         |
| Public timberlands                               | 72.6    | 82.4          | 63.0                        | 72.6         |
| National Forests                                 | 67.3    | 69.2          | 45.4                        | 66.8         |
| Other public <sup>b</sup>                        | 5.3     | 13.2          | 17.6                        | 5.8          |
| Total  | 100     | 100           | 100                         | 100          |

<sup>a</sup>Other timber products include logs used for house logs, log furniture, and industrial fuelwood.

<sup>b</sup>Other public includes State and BLM lands.

**Table 5a**—Wyoming timber harvest by species, selected years.

| Species  | 1983    | 2000   | 2005   | 2010   | 2014   | 2018   |
|--|---------|--------|--------|--------|--------|--------|
| ----- <i>Thousand board feet, Scribner</i> ----- |         |        |        |        |        |        |
| Ponderosa pine                                   | 70,203  | 42,121 | 44,156 | 19,538 | 23,702 | 41,099 |
| Lodgepole pine                                   | 60,058  | 18,824 | 9,853  | 13,383 | 29,024 | 22,535 |
| Engelmann/Black Hills spruce                     | 9,528   | 4,112  | 3,640  | 6,510  | 7,699  | 8,541  |
| Douglas-fir                                      | 4,688   | 3,562  | 5,785  | 1,107  | 6,775  | 4,227  |
| True firs  | 2,492   | 1,661  | 597    | 107    | 178    | 4,491  |
| Other softwoods <sup>a</sup>                     | 93      | 13     | 4      | 1,048  | 9      | 236    |
| Hardwoods  | 36      | 201    | 3      | —      | 161    | 492    |
| All species                                      | 147,098 | 70,494 | 64,038 | 41,694 | 67,548 | 81,621 |

**Table 5b**—Wyoming timber harvest by species, selected years.

| Species                               | 1983 | 2000 | 2005 | 2010 | 2014 | 2018 |
|---------------------------------------|------|------|------|------|------|------|
| ----- <i>Percent of harvest</i> ----- |      |      |      |      |      |      |
| Ponderosa pine                        | 47.7 | 59.8 | 69.0 | 46.9 | 35.1 | 50.4 |
| Lodgepole pine                        | 40.8 | 26.7 | 15.4 | 32.1 | 43.0 | 27.6 |
| Engelmann/Black Hills spruce          | 6.5  | 5.8  | 5.7  | 15.6 | 11.4 | 10.5 |
| Douglas-fir                           | 3.2  | 5.1  | 9.0  | 2.7  | 10.0 | 5.2  |
| True firs                             | 1.7  | 2.4  | 0.9  | 0.3  | 0.3  | 5.5  |
| Other softwoods <sup>a</sup>          | 0.1  | 0.0  | 0.0  | 2.5  | 0.0  | 0.3  |
| Hardwoods                             | 0.0  | 0.3  | 0.0  | —    | 0.2  | 0.6  |
| All species <sup>b</sup>              | 100  | 100  | 100  | 100  | 100  | 100  |

Sources: Brandt et al. 2009; McIver et al. 2018; McLain 1987; Morgan et al. 2005.

<sup>a</sup>Other softwoods include limber pine, western hemlock, western larch, western redcedar, and western white pine.

<sup>b</sup>Percentage detail may not sum to 100 percent due to rounding.

**Table 6a**—Wyoming timber harvest by species and product, 2018.

| Species                    | Sawlogs | Post  | Other products <sup>a</sup> | All products |
|----------------------------|---------|-------|-----------------------------|--------------|
|                            |         |       |                             |              |
| Ponderosa pine             | 41,095  | 4     | —                           | 41,099       |
| Lodgepole pine             | 18,740  | 2,045 | 1,750                       | 22,535       |
| Spruces                    | 8,469   | 12    | 60                          | 8,541        |
| Douglas-fir                | 3,982   | 3     | 242                         | 4,227        |
| Other species <sup>b</sup> | 5,135   | 28    | 56                          | 5,219        |
| All species                | 77,421  | 2,092 | 2,108                       | 81,621       |

**Table 6b**—Wyoming timber harvest by species and product, 2018.

| Species                    | Sawlogs | Post | Other products <sup>a</sup> | All products |
|----------------------------|---------|------|-----------------------------|--------------|
|                            |         |      |                             |              |
| Ponderosa pine             | 53.1    | 0.2  | —                           | 50.4         |
| Lodgepole pine             | 24.2    | 97.8 | 83.0                        | 27.6         |
| Spruces                    | 10.9    | 0.6  | 2.8                         | 10.5         |
| Douglas-fir                | 5.1     | 0.1  | 11.5                        | 5.2          |
| Other species <sup>b</sup> | 6.6     | 1.3  | 2.7                         | 6.4          |
| All species <sup>c</sup>   | 100     | 100  | 100                         | 100          |

<sup>a</sup>Other products include logs used for log homes, log furniture, and industrial fuelwood.

<sup>b</sup>Other species include subalpine fir, Rocky Mountain juniper, and aspen.

<sup>c</sup>Percentage detail may not sum to 100 percent due to rounding.

**Table 7a**—Wyoming sawlog harvest by species, selected years.

| Species                      | 1969   | 1976   | 1983   | 2000   | 2005   | 2010  | 2014   | 2018   |
|------------------------------|--------|--------|--------|--------|--------|-------|--------|--------|
|                              |        |        |        |        |        |       |        |        |
| Ponderosa pine               | 3,383  | 6,000  | 14,138 | 8,870  | 9,235  | 3,916 | 5,130  | 9,381  |
| Lodgepole pine               | 21,300 | 12,546 | 11,990 | 2,869  | 1,394  | 2,362 | 5,558  | 4,278  |
| Engelmann/Black Hills spruce | 3,399  | 2,563  | 1,902  | 863    | 761    | 1,110 | 1,645  | 1,933  |
| Douglas-fir                  | 833    | 1,323  | 937    | 622    | 1,183  | 185   | 1,461  | 909    |
| True firs                    | 369    | 1,084  | 503    | 222    | 124    | 18    | 2      | 1,012  |
| Other species <sup>a</sup>   | 3      | 75     | 26     | 3      | —      | 171   | 35     | 160    |
| All species                  | 29,287 | 23,591 | 29,496 | 13,449 | 12,697 | 7,762 | 13,831 | 17,674 |

**Table 7b**—Wyoming sawlog harvest by species, selected years.

| Species                      | 1969 | 1976 | 1983 | 2000 | 2005 | 2010 | 2014 | 2018 |
|------------------------------|------|------|------|------|------|------|------|------|
|                              |      |      |      |      |      |      |      |      |
| Ponderosa pine               | 11.6 | 25.4 | 47.9 | 66.0 | 72.7 | 48.5 | 37.1 | 53.1 |
| Lodgepole pine               | 72.7 | 53.2 | 40.6 | 21.3 | 11.0 | 25.0 | 40.2 | 24.2 |
| Engelmann/Black Hills spruce | 11.6 | 10.9 | 6.4  | 6.4  | 6.0  | 19.8 | 11.9 | 10.9 |
| Douglas-fir                  | 2.8  | 5.6  | 3.2  | 4.6  | 9.3  | 3.3  | 10.6 | 5.1  |
| True firs                    | 1.3  | 4.6  | 1.7  | 1.7  | 1.0  | 0.3  | 0.0  | 5.7  |
| Other species <sup>a</sup>   | 0.0  | 0.0  | 0.0  | 0.0  | -    | 3.1  | 0.3  | 0.9  |
| All species <sup>b</sup>     | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  |

Sources: Brandt et al. 2009; Keegan and White 1979; Keegan et al. 1979; McIver et al. 2018; McLain 1987; Morgan et al. 2005; Setzer 1971

<sup>a</sup>Other species include aspen, limber pine, western hemlock, western larch, western redcedar, and western white pine.

<sup>b</sup>Percentage detail may not sum to 100 percent due to rounding.

## End Uses

Wyoming’s 2018 total timber harvest was approximately 18,973 MCF, which went to timber processors both within and outside the State. Of this volume, 93.7 percent (17,793 MCF) went to sawmills, 4.6 percent (864 MCF) went to post and pole manufacturers, and 1.7 percent (316 MCF) went to other facilities, including house log/log home facilities, and firewood and wood pellet manufacturing (fig. 4).

By converting all mill inputs from board feet Scribner to cubic feet, inputs are measured in the same units as outputs, thus accounting for both mill residues and timber products. This allows the flows of wood fiber from different components of the industry, which usually express outputs in different units, to be analyzed collectively. The following conversion factors, converting Scribner board foot volume to cubic feet, were developed from log size specifications, as well as product and residue recovery information, provided by processors of Wyoming’s 2018 timber harvest:

- 5.01 board feet per cubic foot for house logs
- 4.37 board feet per cubic foot for sawlogs
- 2.55 board feet per cubic foot for posts and poles
- 4.88 board feet per cubic foot for all other products

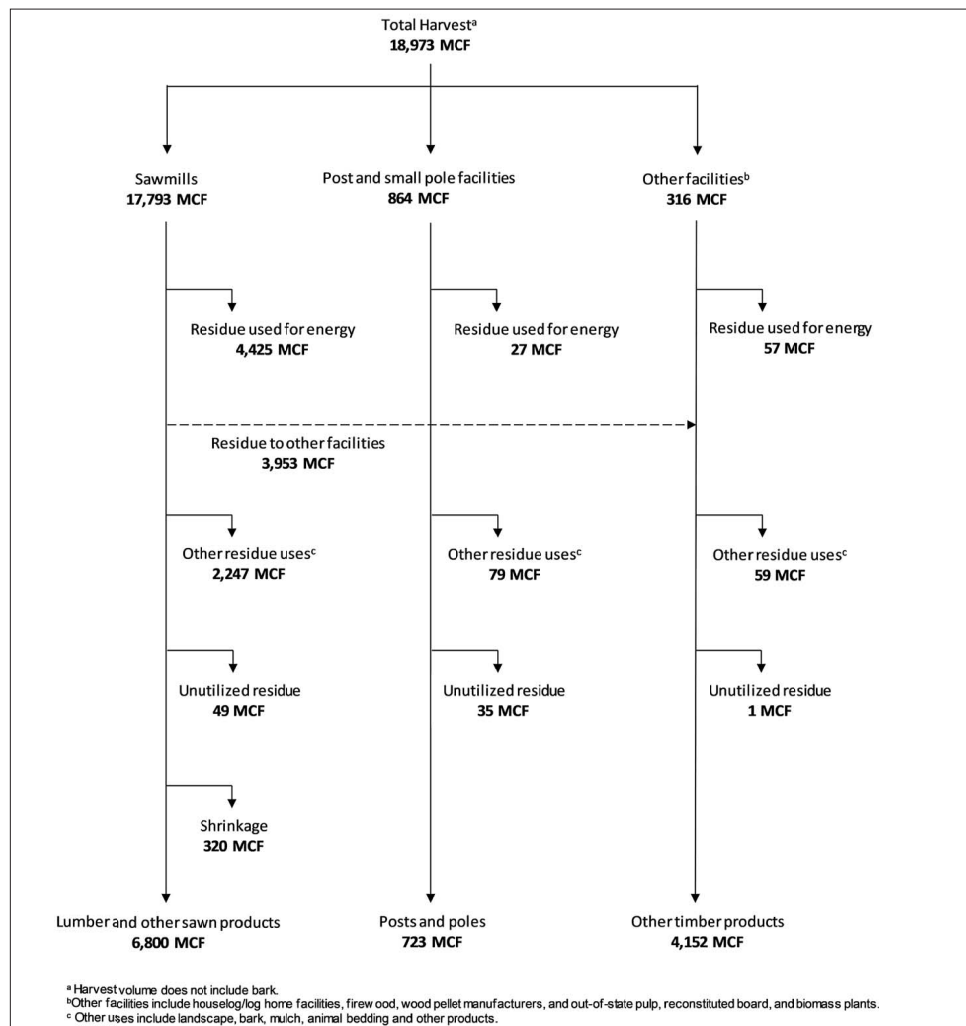


Figure 4—Wyoming timber harvest and utilization.

## Timber Flow

Wyoming continues to have proportionately larger flows of timber into and out of the State than other western States, primarily because its timber resource and mills are located along its borders. In 2018, Wyoming mills brought in 27.6 MMBF of timber from other States, while 30.5 MMBF of Wyoming timber was processed out-of-state, making the State a net exporter of 2.9 MMBF of timber (tables 8, 9, and 10). In 2014, Wyoming was a net importer of nearly 24 MMBF of timber, with mills bringing in more than 49 MMBF of timber from other States (McIver et al. 2018b), nearly double the imports observed in 2018. During 2014, more than 25 MMBF was processed out-of-state (McIver et al. 2018b) compared with the 30.5 MMBF exported in 2018. More than 58 MMBF crossed Wyoming State lines in 2018, a volume equal to 71 percent of the State’s timber harvest. In comparison, nearly 75 MMBF crossed Wyoming State lines in 2014, a volume equivalent to 110 percent of the State’s timber harvest that year.

Of the Wyoming timber processed in-state, 92 percent was processed in the resource area where it was harvested (table 11). The proportion of timber harvested and processed in the same resource area increased from 60 percent in 2014. Contractions in lumber markets likely made it uneconomical for timber to travel farther to be processed.

**Table 8**—Timber flow into (imports) and out of (exports) Wyoming, 2018.

| Timber products             | Imports                                   | Exports | Net imports (Net exports) |
|-----------------------------|---|---------|---------------------------|
|                             | ----- Thousand board feet, Scribner ----- |         |                           |
| Sawlogs                     | 26,762                                    | 28,470  | (1,708)                   |
| Post and pole               | 844                                       | 656     | 188                       |
| Other products <sup>a</sup> | 6   | 1,416   | (1,410)                   |
| All products                | 27,612                                    | 30,542  | (2,930)                   |

<sup>a</sup>Other products include house logs and log furniture.

**Table 9**—Origin of timber processed by Wyoming mills by State, 2018.

| Origin                             | Amount processed (MBF) | Percent of volume processed |
|------------------------------------|------------------------|-----------------------------|
| Colorado                           | 8,027                  | 10.2                        |
| Idaho                              | 60                     | 0.1                         |
| Montana                            | 483                    | 0.6                         |
| South Dakota                       | 14,941                 | 19.0                        |
| Utah                               | 4,100                  | 5.2                         |
| <i>Total from out-of-state</i>     | <i>27,611</i>          | <i>35.1</i>                 |
| Wyoming                            | 51,080                 | 64.9                        |
| Total from all States <sup>a</sup> | 78,691                 | 100                         |

<sup>a</sup>Total may not add to 100 percent due to rounding.



**Table 10**—Location of mills processing timber harvested in Wyoming, 2018.

| Mill location                    | Amount processed (MBF) | Percent of volume processed |
|----------------------------------|------------------------|-----------------------------|
| Colorado                         | 24                     | < 1                         |
| Idaho                            | 1,200                  | 1.5                         |
| Montana                          | 7,876                  | 9.6                         |
| South Dakota                     | 21,442                 | 26.3                        |
| <i>Total to out-of-state</i>     | <i>30,542</i>          | <i>37.4</i>                 |
| Wyoming                          | 51,080                 | 62.6                        |
| Total to all states <sup>a</sup> | 81,621                 | 100                         |

<sup>a</sup>Total may not add to 100 percent due to rounding.

**Table 11**—Wyoming's timber flow by resource area, 2018.

| Destination                                      | Geographic source of timber |           |           |           |           | Total for destination | Percent for destination |
|--|-----------------------------|-----------|-----------|-----------|-----------|-----------------------|-------------------------|
|  | North Central               | Northeast | Northwest | Southeast | Southwest |                       |                         |
| <i>----- Thousand board feet, Scribner -----</i> |                             |           |           |           |           |                       |                         |
| North Central                                    | 1,265                       | —         | 68        | —         | —         | 1,333                 | 1.6                     |
| Northeast  | —                           | 20,241    | —         | —         | —         | 20,241                | 24.8                    |
| Northwest  | —                           | —         | 924       | —         | —         | 924                   | 1.1                     |
| Southeast  | —                           | —         | —         | 20,231    | —         | 20,231                | 24.8                    |
| Southwest  | —                           | —         | 3,950     | —         | 4,402     | 8,352                 | 10.2                    |
| Shipped out of WY                                | 4,685                       | 21,329    | 4,504     | 25        | —         | 30,542                | 37.4                    |
| Total timber harvest                             | 5,950                       | 41,570    | 9,445     | 20,256    | 4,402     | 81,621                | 100                     |
| Percent of total harvest                         | 7.3                         | 50.9      | 11.6      | 24.8      | 5.4       | 100                   |                         |

## FOREST PRODUCTS INDUSTRY

The 2018 census identified 30 active primary forest products manufacturers in Wyoming. The facilities in Wyoming produced an array of products, including lumber and sawn products, wood pellets, house logs, posts, poles and rails, firewood, log furniture, and animal bedding. Sales of finished products totaled \$63.3 million in 2018, a 5 percent (inflation adjusted) decrease compared to 2014. Despite an increase in timber harvest volume, volume received at Wyoming mills was less in 2018 than 2014.

The total number of mills reported in 2018 was two more than in 2014 (table 12). There were the same number of sawmills (12) and the number of post and pole producers increased by 3 facilities, to a total of 12. The number of log home and log furniture facilities each decreased, for a 2018 total of two and one, respectively. Wyoming also gained one facility in the “other products” category. Fremont and Uinta counties had the greatest number of wood products facilities in 2018, with five each (fig. 5). Albany County had four facilities, while Crook and Sublette counties had three each.

**Table 12**—Active Wyoming primary wood products facilities by county and product, 2018 and other years.

| County                | Sawmills | Post and poles | Log homes | Log furniture | Other products <sup>a</sup> | All products |
|-----------------------|----------|----------------|-----------|---------------|-----------------------------|--------------|
| Northeast Wyoming     | 2        | 1              | —         | —             | —                           | 3            |
| Campbell              | —        | —              | —         | —             | —                           | —            |
| Crook                 | 2        | 1              | —         | —             | —                           | 3            |
| Weston                | —        | —              | —         | —             | —                           | —            |
| North Central Wyoming | 3        | 2              | —         | —             | —                           | 5            |
| Big Horn              | 1        | 1              | —         | —             | —                           | 2            |
| Johnson               | 1        | 1              | —         | —             | —                           | 2            |
| Sheridan              | —        | —              | —         | —             | —                           | —            |
| Washakie              | 1        | —              | —         | —             | —                           | 1            |
| Northwest Wyoming     | 3        | 4              | 1         | —             | 1                           | 9            |
| Fremont               | 1        | 3              | —         | —             | —1                          | 5            |
| Hot Springs           | —        | —              | —         | —             | —                           | —            |
| Lincoln               | 1        | —              | —         | —             | —                           | 1            |
| Park                  | —        | —              | —         | —             | —                           | —            |
| Sublette              | 1        | 1              | 1         | —             | —                           | 3            |
| Teton                 | —        | —              | —         | —             | —                           | —            |
| Southeast Wyoming     | 2        | 3              | 1         | 1             | 1                           | 8            |
| Albany                | —        | 2              | 1         | 1             | —                           | 4            |
| Carbon                | 1        | —              | —         | —             | —                           | 1            |
| Converse              | 1        | 1              | —         | —             | —                           | 2            |
| Goshen                | —        | —              | —         | —             | —                           | —            |
| Laramie               | —        | —              | —         | —             | 1                           | 1            |
| Natrona               | —        | —              | —         | —             | —                           | —            |
| Niobrara              | —        | —              | —         | —             | —                           | —            |
| Platte                | —        | —              | —         | —             | —                           | —            |
| Southwest Wyoming     | 2        | 2              | —         | —             | 1                           | 5            |
| Sweetwater            | —        | —              | —         | —             | —                           | —            |
| Uinta                 | 2        | 2              | —         | —             | —                           | 5            |
| 2018 Total            | 12       | 12             | 2         | 1             | 3                           | 30           |
| 2014 Total            | 12       | 9              | 3         | 2             | 2                           | 28           |
| 2010 Total            | 12       | 7              | 3         | 2             | 5                           | 29           |
| 2005 Total            | 21       | 8              | 18        | 8             | 4                           | 59           |
| 2000 Total            | 23       | 8              | 8         | 11            | 5                           | 55           |
| 1983 Total            | 34       | 3              | 4         | 0             | 0                           | 41           |
| 1976 Total            | 50       | 7              | 4         | 0             | 1                           | 62           |
| 1962 Total            | 76       | 0              | 0         | 0             | 0                           | 76           |

Sources: Brandt et al. 2009; Keegan et al. 1979; Keegan and White 1979; McIver et al. 2018; McLain 1987; Morgan et al. 2005.

<sup>a</sup>Other primary products include fuel pellets, firewood, and other primary manufacturers.

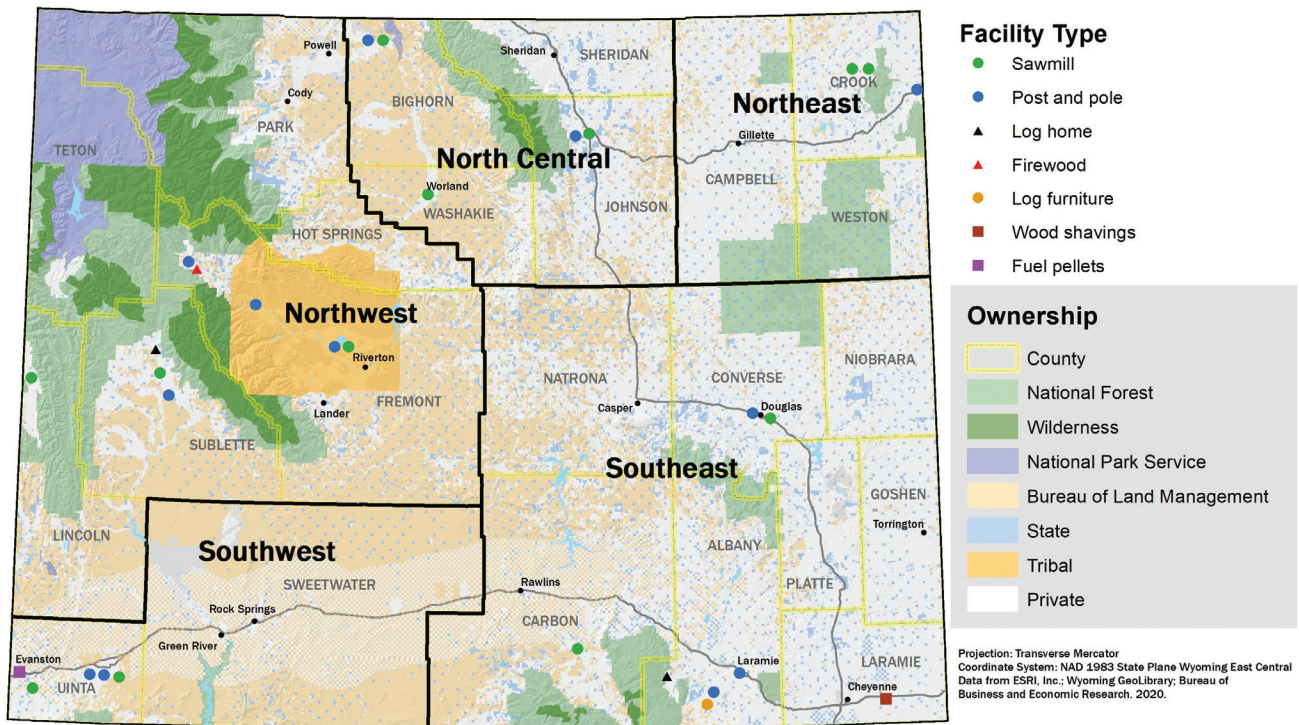


Figure 5—Location of Wyoming’s primary wood products manufacturers, 2018.

## Timber Received by Wyoming Mills

As opposed to the volume of timber harvested within a State, timber received refers to the volume of timber delivered to in-state mills from both in-state and out-of-state sources. In 2018, Wyoming mills received 78.7 MMBF of timber for processing. This amount constituted a 14 percent decrease from the amount processed in 2014 (tables 13, 14).

Twenty-two percent (17.4 MMBF) of the timber received by Wyoming mills in 2018 originated from private lands, while public timberlands contributed the remaining 78 percent (61.3 MMBF). These are the same proportions as in 2014 but dramatically different from 2005, when private lands contributed 57 percent and public lands 43 percent.

Table 13—Timber received at Wyoming mills by ownership class, 2018.

| Ownership class           | Volume<br><i>MBF, Scribner</i> | Percent of total |
|---------------------------|--------------------------------|------------------|
| Private                   | 17,386                         | 22.1             |
| Industrial                | —                              | —                |
| Non-industrial            | 17,386                         | 22.1             |
| Public                    | 61,306                         | 77.9             |
| National Forest           | 53,993                         | 68.6             |
| Other public <sup>a</sup> | 7,313                          | 9.3              |
| Canadian                  | —                              | —                |
| All owners <sup>b</sup>   | 78,691                         | 100              |

<sup>a</sup>Other public includes State and BLM lands.

<sup>b</sup>Percentage detail may not sum to 100 percent due to rounding.

**Table 14**—Timber received at Wyoming mills by ownership class and product type, 2018.

| Ownership class           | Sawlogs                                   | Post and pole | Other products <sup>a</sup> | All products |
|---------------------------|---|---------------|-----------------------------|--------------|
|                           | ----- Thousand board feet, Scribner ----- |               |                             |              |
| Private                   | 16,734                                    | 514           | 138                         | 17,386       |
| Industrial                | —   | —             | —                           | —            |
| Non-industrial            | 16,734                                    | 514           | 138                         | 17,386       |
| Public                    | 58,980                                    | 1,766         | 560                         | 61,306       |
| National Forest           | 52,249                                    | 1,556         | 188                         | 53,993       |
| Other public <sup>b</sup> | 6,731                                     | 210           | 372                         | 7,313        |
| All owners                | 75,713                                    | 2,280         | 698                         | 78,691       |

<sup>a</sup>Other products include logs used for log homes, log furniture, and industrial fuelwood.

<sup>b</sup>Other public includes state and BLM lands.

## Trends and Capacity by Sector

### Sawmill Sector

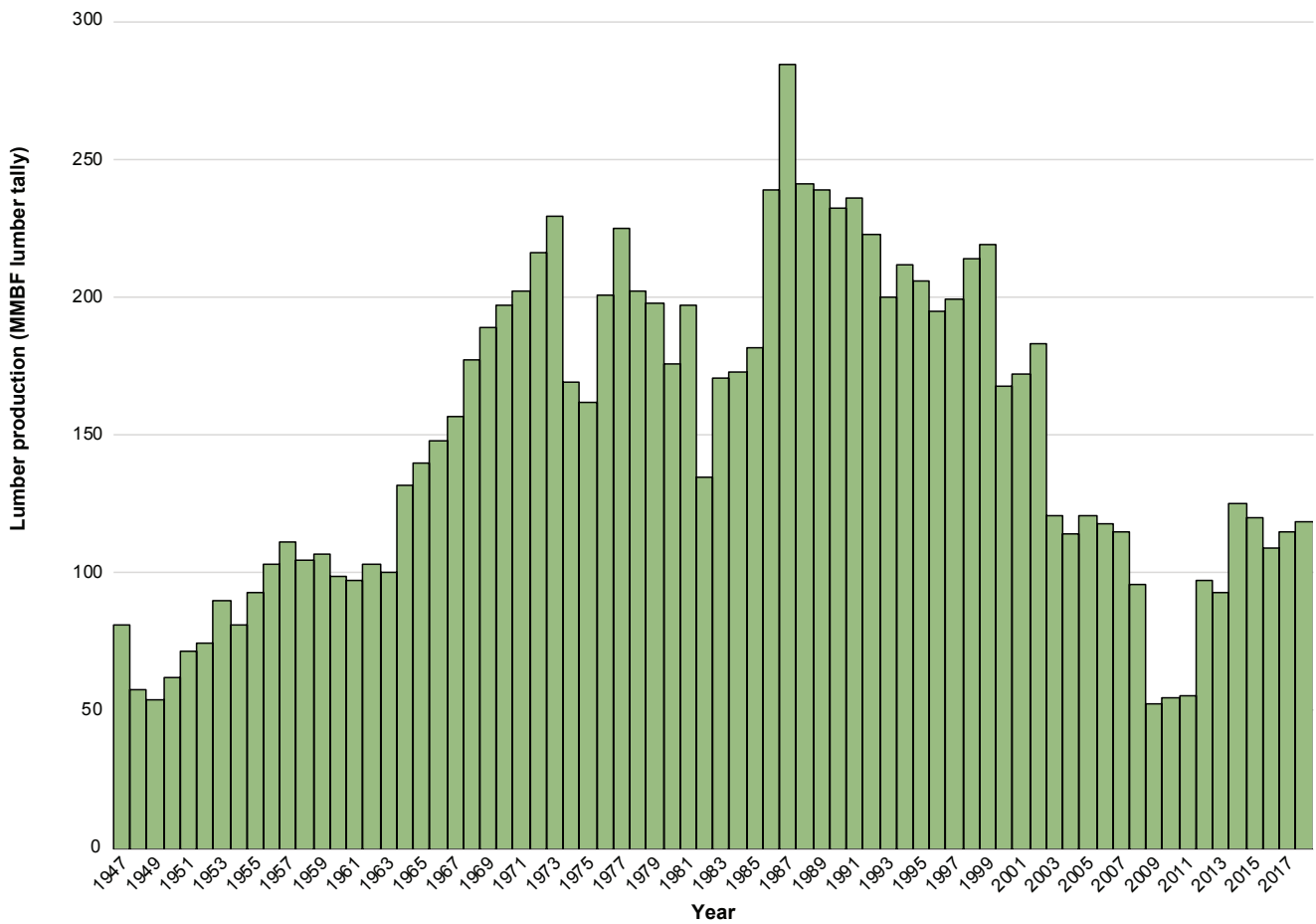
Lumber production in Wyoming peaked in the 1980s and has generally been declining since (fig. 6), following trends observed in several other western States (McIver et al. 2013 and 2015; Sorenson et al. 2012). Lumber-production declines continued into the 21st century despite strong housing and lumber markets in 2004 and 2005. These markets bottomed out in 2009, severely impacting Wyoming’s remaining forest products industry, though a slow recovery began in 2010 and 2011. By 2014, timber harvest and lumber production exceeded prerecession levels, only to drop again by 2018 to reach an average annual production level of 9.9 MMBF (table 15). This constitutes a 5 percent decrease from 2014.

Wyoming’s 12 sawmills processed 77.7 MMBF Scribner in 2018, 102 percent more than the volume of sawlogs received by Wyoming sawmills due to existing inventory. These sawmills produced about 118.4 MMBF lumber tally of lumber, timbers, and other sawn products, which constitutes a 5 percent decrease compared to 2014 production. Sales from the sawmill sector were \$57 million, compared to the 2014 sales value of slightly less than \$60 million (inflation adjusted).

The 12 sawmills active in Wyoming in 2018 had a combined annual production capacity of 171.3 MMBF lumber tally, of which only 69 percent was utilized (table 18). The 6 sawmills with annual output capacity greater than 1 MMBF accounted for 98 percent of the State’s lumber-producing capacity and 99 percent of lumber production.

### Post and Pole Sector

The post and pole sector consists of manufacturers of fence posts, small poles and rails used in fence construction. The number of post and pole producers jumped from 9 facilities in 2014 to 12 in 2018, an increase of 33 percent. The combined annual output capacity of the 12 active Wyoming producers was 1,558,000 pieces with 957,000 pieces produced, for a capacity utilization of 61 percent.



**Figure 6**—Wyoming annual lumber production 1947–2018 (source: WWPA 1947-2019).

**Table 15**—Active Wyoming sawmills and annual average lumber production per mill, selected years.

| Year | Number of mills | Average annual lumber production per mill |  |
|------|-----------------|---|--|
|      |                 | MMBF, lumber tally                        |  |
| 2018 | 12              | 9.9                                       |  |
| 2014 | 12              | 10.4                                      |  |
| 2010 | 12              | 4.6                                       |  |
| 2005 | 21              | 6.0                                       |  |
| 2000 | 23              | 7.3                                       |  |
| 1983 | 34              | 5.0                                       |  |
| 1976 | 50              | 4.1                                       |  |
| 1974 | 49              | 3.4                                       |  |
| 1969 | 50              | 3.8                                       |  |
| 1966 | 65              | 1.9                                       |  |
| 1962 | 76              | 1.4                                       |  |
| 1957 | 107             | 1.0                                       |  |

Sources: Brandt et al. 2009; Keegan and White 1979; Keegan et al. 1979; McIver et al. 2018; McLain 1987; Miller and Wilson 1959; Morgan et al. 2005; Setzer and Wilson 1970; Setzer 1971; Spencer and Farrenkopf 1964.

## **Log Home and Log Furniture Sector**

In 2018, Wyoming had two log home manufacturers and one manufacturer of log furniture, down from three and two, respectively, in 2014. The sector's peak was in 2005, when 18 log home and 8 log furniture businesses were active. The severe contraction in this sector was largely due to the 2006 housing collapse and recession as these products tend to be luxury goods and, as such, tie the industry to regional and national economic conditions. However, with relatively low capital costs, many inactive facilities could recommence production as demand increases.

## **Other Sectors**

The three remaining primary forest products facilities active during 2018 in Wyoming include a pellet mill, one animal shavings manufacturer, and a commercial firewood producer. The pellet and shavings operations utilized chips, sawdust, and shavings generated as mill residue by other primary processing facilities. Production statistics and sales figures for the individual sectors are not provided in order to protect firm-level data.

## **Input and Other Capacity**

There are two measures of capacity: input capacity, which refers to timber processing, and output, referring to production. Output capacity is the most commonly utilized, measuring the volume of finished product a mill could produce within a given timeframe, usually per shift or per year. However, finished products are measured in a variety of units depending on the output: board feet lumber tally (lumber), lineal feet (house logs), and pieces (posts and poles, log furniture), etc., making it difficult to express the total capacity of the industry as a whole. The alternative is to use input capacity, often measured as timber-processing capacity, which is a measure of the volume of timber (i.e., logs) that a mill could process in a given timeframe, generally per year, measured in board feet Scribner.

### **Timber-Processing Capacity**

Wyoming timber processors provided their 8-hour shift and annual production capacities, given sufficient supplies of raw materials and a firm market demand for their products. To estimate the industry's total capacity to process timber, production capacity was divided by each facility's recovery factor and expressed in units of timber input (i.e., MMBF Scribner) (tables 16 and 17). For example, sawmill capacity figures were calculated by dividing a mill's lumber-production capacity by that mill's calculated lumber recovery, measured in board feet of lumber per board foot Scribner of timber.

Wyoming's 2018 timber-processing capacity was 116.7 MMBF Scribner, of which 69 percent was utilized—a decrease of more than 9 percent compared to 2014. Capacity has dropped by more than 60 percent since its 1986 peak of close to 308 MMBF. Wyoming capacity utilization has historically not exceeded 50 percent (fig. 7); however, recent improvements in wood product markets and rising timber harvests on private and State lands in the region have enabled remaining facilities to increase operating levels over the past few years.

**Table 16**—Active primary timber processors<sup>a</sup> by capacity size class, percent of total timber capacity, timber use, and percent of total timber use, 2018.

| Log input capacity size class <sup>b</sup> | Number of mills | Timber capacity<br><i>MBF<sup>c</sup></i> | Percent of total timber capacity | Average timber capacity per mill<br><i>MBF<sup>c</sup></i> | Timber use<br><i>MBF<sup>c</sup></i> | Percent of total timber use | Average timber use per mill<br><i>MBF<sup>c</sup></i> |
|--|-----------------|---|----------------------------------|--|--------------------------------------|-----------------------------|---|
| 1 MMBF or less                             | 21              | 5,885                                     | 5.1                              | 280  | 4,758                                | 5.9                         | 227   |
| Between 1 and 5 MMBF                       | 4               | 11,908                                    | 10.3                             | 2,977  | 4,725                                | 5.9                         | 1,181   |
| Over 5 MMBF                                | 3               | 97,893                                    | 84.6                             | 32,631   | 71,256                               | 88.3                        | 23,752  |
| Total                                      | 28              | 115,686                                   | 100                              | 4,132  | 80,739                               | 100                         | 2,884   |

<sup>a</sup>Includes only roundwood receiving facilities. Pellet mills and animal shavings manufacturers are not included.

<sup>b</sup>Log input capacity is expressed in million board feet (MMBF), Scribner.

<sup>c</sup>Timber use and capacity are expressed in thousand board feet (MBF) Scribner.

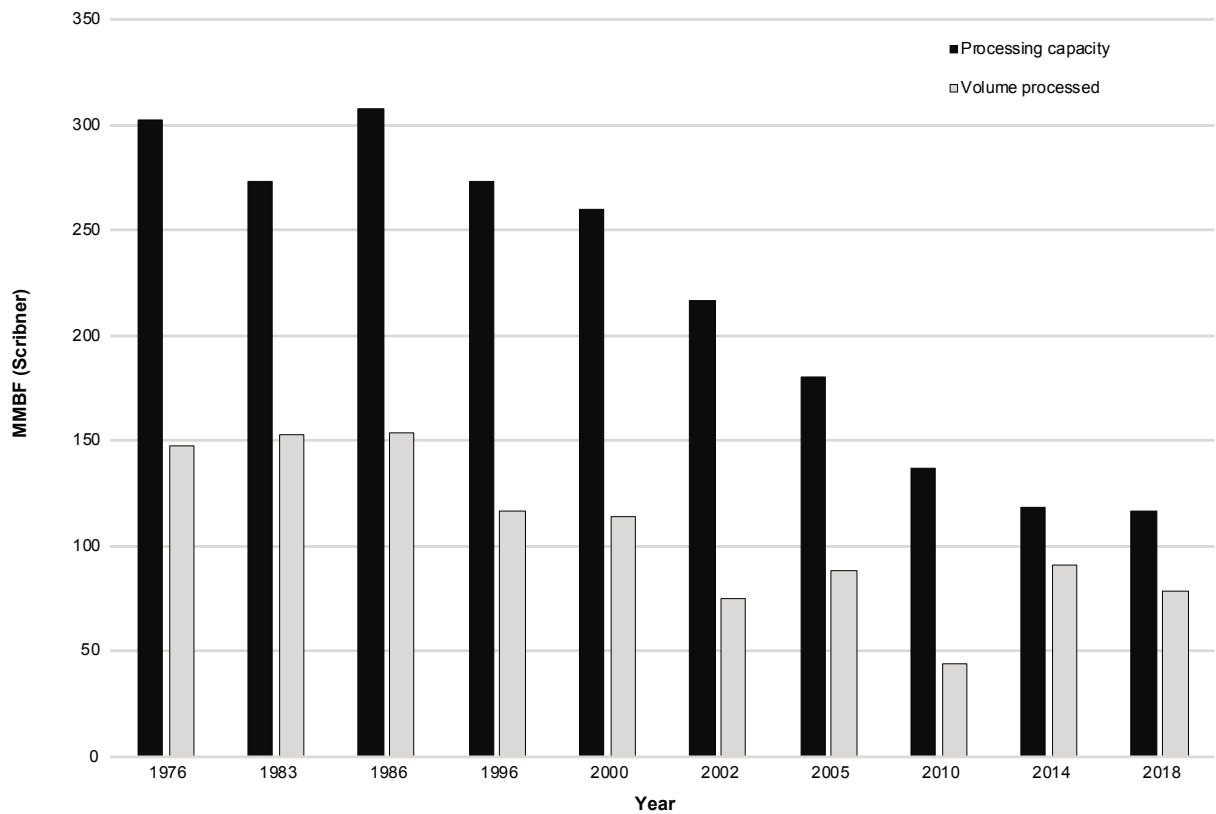
**Table 17**—Wyoming's timber-processing capacity and volume utilized, 1976–2018.

| Year              | Processing capacity <sup>a</sup>          | Volume utilized | Percent utilized |
|-------------------|---|-----------------|------------------|
|                   | ----- Thousand board feet, Scribner ----- |                 |                  |
| 2018              | 116,682                                   | 80,739          | 69.2             |
| 2014 <sup>b</sup> | 118,845                                   | 91,204          | 76.7             |
| 2010              | 137,104                                   | 43,873          | 32.0             |
| 2005 <sup>b</sup> | 180,157                                   | 88,522          | 49.1             |
| 2002              | 217,094                                   | 74,875          | 34.0             |
| 2000              | 260,194                                   | 113,687         | 44.0             |
| 1996              | 273,483                                   | 116,906         | 43.0             |
| 1986              | 307,800                                   | 153,608         | 50.0             |
| 1983              | 272,867                                   | 153,260         | 56.0             |
| 1976              | 302,083                                   | 147,280         | 49.0             |

Sources: Brandt et al. 2009; Keegan and White 1979; McLain 1987; McIver et al. 2018; Morgan et al. 2005; Keegan et al. 1979.

<sup>a</sup>Includes active and inactive sawmills, post and pole, log home, log furniture, and commercial firewood facilities.

<sup>b</sup>Represents revised processing capacity.



**Figure 7**—Wyoming timber-processing capacity, selected years (sources: Keegan and White 1979; Keegan and others 1979; McLain 1987; Morgan et al. 2005; Brandt et al. 2009; Mclver et al. 2018).

## Lumber-Production Capacity

Capacity to produce lumber varies considerably among Wyoming’s 12 sawmills, from less than 1 MMBF to over 100 MMBF (table 18). Lumber-production capacity in 2018 was 171.3 MBF lumber tally, of which 69 percent was utilized.

## Mill Residue

Over half (58 percent) of the wood fiber processed by primary forest products manufacturers in Wyoming in 2018 ended up as mill residue. Residue can present a difficult and expensive disposal problem, or it can be used to produce additional products to generate revenue. The three types of wood residues include coarse residues (chips, slabs, edging, trim, and log ends), fine residue (planer shavings and sawdust), and bark.

**Table 18**—Capacity and production of active Wyoming sawmills by production capacity size class, 2018.

| Lumber production capacity size class | Number of mills | Production capacity | Percent of total capacity | Average capacity per mill | Production     | Percent of total production | Average production per mill |
|---------------------------------------|-----------------|---------------------|---------------------------|---------------------------|----------------|-----------------------------|-----------------------------|
|                                       |                 | <i>MBF</i>          |                           | <i>MBF</i>                | <i>MBF</i>     | <i>MBF</i>                  | <i>MBF</i>                  |
| 1 MMBF or less                        | 6               | 2,300               | 1.3                       | 383                       | 625            | 0.5                         | 104                         |
| between 1 and 10 MBF                  | 3               | 11,000              | 6.4                       | 3,667                     | 8,690          | 7.3                         | 2,897                       |
| over 10 MMBF                          | 3               | 158,000             | 92.2                      | 52,667                    | 109,050        | 92.1                        | 36,350                      |
| <b>Total<sup>a</sup></b>              | <b>12</b>       | <b>171,300</b>      | <b>100.0</b>              | <b>14,275</b>             | <b>118,365</b> | <b>100.0</b>                | <b>9,864</b>                |

<sup>a</sup> Percentage detail may not sum to 100 percent due to rounding.



Wyoming primary forest product manufacturers generated 142,710 bone dry units (BDU) of mill residue in 2018, 97 percent of which was utilized (table 19). This constitutes just a slight increase from 96 percent in 2014. The proportion of mill residues that are utilized has been increasing over time, from 33 percent in 1969, to 60 percent in 1983, 85 percent in 2000, and 97 percent in 2010—very similar to utilization rates observed during 2018 (Brandt et al. 2009; McIver et al. 2014; Morgan et al. 2005).

Thirty-nine percent (55,411 BDU) of Wyoming’s 2018 mill residue was used for energy, including firewood, raw material to manufacture wood pellets, burned to generate electricity, or burned in a boiler system on-site at mills (table 19). Another 33 percent (46,651 BDU) went to pulp and reconstituted board plants, while 25 percent (35,891 BDU) of residue was used for animal bedding, mulch, and decorative bark. The remaining 3 percent (4,756) was not used.

Statewide residue volume factors (table 20), which express mill residue generated per MBF of lumber produced, were derived from production and residue output volumes provided by Wyoming sawmills. Sawmills accounted for 88 percent of all mill residues generated in 2018, or about 126,000 BDU. More than 99 percent of this residue was utilized (table 21), with the highest utilization (100 percent) in coarse residue types. The forest industry has worked towards improving residue utilization through investments of time and capital, and sawmill utilization of residue has increased over time (table 22).

**Table 19a**—Wyoming’s production and disposition of residues, 2018.

| Type of residue <sup>a</sup>      | Pulp and board | Energy        | Other uses    | Total utilized | Non-utilized | Total          |
|-----------------------------------|----------------|---------------|---------------|----------------|--------------|----------------|
| ----- <i>Bone-dry units</i> ----- |                |               |               |                |              |                |
| Coarse                            | 36,911         | 20,029        | 12,362        | 69,302         | 455          | 69,757         |
| Fine:                             | 9,740          | 23,449        | 15,522        | 48,711         | 848          | 49,560         |
| <i>Sawdust</i>                    | 6,003          | 15,800        | 3,105         | 24,908         | 463          | 25,370         |
| <i>Planer shavings</i>            | 3,737          | 7,649         | 12,418        | 23,804         | 386          | 24,189         |
| Bark                              | -              | 11,934        | 8,007         | 19,941         | 3,453        | 23,393         |
| <b>Total</b>                      | <b>46,651</b>  | <b>55,411</b> | <b>35,891</b> | <b>137,954</b> | <b>4,756</b> | <b>142,710</b> |

**Table 19b**—Wyoming’s production and disposition of residues, 2018.

| Type of residue <sup>a</sup>        | Pulp and board | Energy      | Other uses  | Total utilized | Non-utilized | Total      |
|-------------------------------------|----------------|-------------|-------------|----------------|--------------|------------|
| ----- <i>Percent of total</i> ----- |                |             |             |                |              |            |
| Coarse                              | 52.9           | 28.7        | 17.7        | 99.3           | 0.7          | 100        |
| Fine:                               | 19.7           | 47.3        | 31.3        | 98.3           | 1.7          | 100        |
| <i>Sawdust</i>                      | 23.7           | 62.3        | 12.2        | 98.2           | 1.8          | 100        |
| <i>Planer shavings</i>              | 15.4           | 31.6        | 51.3        | 98.4           | 1.6          | 100        |
| Bark                                | -              | 51.0        | 34.2        | 85.2           | 14.8         | 100        |
| <b>Total</b>                        | <b>32.7</b>    | <b>38.8</b> | <b>25.1</b> | <b>96.7</b>    | <b>3.3</b>   | <b>100</b> |

<sup>a</sup> Includes residue from the manufacture of post and poles, house logs, and log furniture, as well as lumber and plywood.

**Table 20**—Wyoming sawmill residue factors, 2018.

| Type of residue | Bone-dry units <sup>a</sup>                 |
|-----------------|---|
|                 | <i>Per thousand board feet lumber tally</i> |
| Coarse          | 0.56  |
| Sawdust         | 0.21  |
| Planer Shavings | 0.16  |
| Bark            | 0.13  |
| <b>Total</b>    | <b>1.06</b>                                 |

<sup>a</sup>Bone-dry units (2,400 lbs. of oven-dry wood) of the various residue types generated for every 1,000 board feet of lumber manufactured.

**Table 21**—Estimated volume of wood residue generated and utilized by Wyoming sawmills, 2018.

| Residue type      | Wood residue          |            |                | Percentage of type |            |            |
|-------------------|-----------------------|------------|----------------|--------------------|------------|------------|
|                   | Used                  | Unused     | Total          | Used               | Unused     | Total      |
|                   | <i>Bone-dry units</i> |            |                | <i>Percent</i>     |            |            |
| Coarse            | 66,747                | 33         | 66,780         | 100.0              | -          | 53.0       |
| Fine <sup>a</sup> | 43,997                | 125        | 44,122         | 99.7               | 0.3        | 35.0       |
| Bark              | 14,649                | 415        | 15,064         | 97.2               | 2.8        | 12.0       |
| <b>Total</b>      | <b>125,393</b>        | <b>573</b> | <b>125,966</b> | <b>99.5</b>        | <b>0.5</b> | <b>100</b> |

<sup>a</sup>Fine residue includes sawdust and planer shavings.

**Table 22**—Historical sawmill utilization of Wyoming mill residues.

| Residue      | Year | Used                | Unused |
|--------------|------|---------------------|--------|
|              |      | ----- Percent ----- |        |
| Coarse       | 2018 | 100.0               | -      |
|              | 2014 | 95.9                | 4.1    |
|              | 2010 | 99.8                | 0.2    |
|              | 2005 | 98.5                | 1.5    |
|              | 2000 | 97.7                | 2.3    |
|              | 1983 | 77.4                | 22.6   |
|              | 1976 | 77.8                | 22.2   |
|              | 1969 | 58.2                | 41.8   |
| Fine         | 2018 | 99.9                | 0.3    |
|              | 2014 | 99.1                | 0.9    |
|              | 2010 | 99.7                | 0.3    |
|              | 2005 | 99.7                | 0.3    |
|              | 2000 | 98.8                | 1.2    |
|              | 1983 | 49.4                | 50.6   |
|              | 1976 | 34.9                | 65.1   |
|              | 1969 | 28.7                | 71.3   |
| Bark         | 2018 | 97.2                | 2.8    |
|              | 2014 | 88.3                | 11.7   |
|              | 2010 | 90.9                | 9.1    |
|              | 2005 | 69.8                | 30.2   |
|              | 2000 | 32.5                | 67.5   |
|              | 1983 | 31.9                | 68.1   |
|              | 1976 | 11.7                | 88.3   |
|              | 1969 | 0.1                 | 99.9   |
| All residues | 2018 | 99.5                | 0.5    |
|              | 2014 | 96.5                | 3.5    |
|              | 2010 | 97.3                | 2.7    |
|              | 2005 | 91.9                | 8.1    |
|              | 2000 | 84.5                | 15.5   |
|              | 1983 | 59.5                | 40.5   |
|              | 1976 | 48.6                | 51.4   |
|              | 1969 | 32.8                | 67.2   |

Sources: Brandt et al. 2009; Keegan et al. 1979; Keegan and White 1979; McIver et al. 2018; McLain 1987; Morgan et al. 2005; Setzer 1971.

# PRIMARY PRODUCT SALES VALUE AND MARKETS

The 2018 FIDACS census in Wyoming identified 30 active primary forest products manufacturers, reporting total sales of more than \$63 million, free on board (f.o.b.) the producing mill (table 23). This constitutes a 5 percent decrease from 2014, when sales were reported at almost \$66.5 million (constant 2018 dollars). Sales of lumber and other sawn products continue to account for the bulk (90 percent) with a total sales value of \$57 million (fig. 8). While this proportion is a sizeable increase over 2014, total sales value for this product category increased by less than \$1 million, or 1 percent. The next largest sector, posts and poles, experienced a sizeable drop in sales value, from \$5.3 million (constant 2018 dollars) in 2014 to \$3.8 million in 2018. Sales value for house logs and log homes was \$152,000 (less than 1 percent of total sales) and close to \$2.3 million for other products (4 percent of total sales).

Approximately \$57 million (90 percent) of Wyoming’s primary wood products sales were to locations outside the State (fig. 9). The greatest market reported was the North Central Region (34 percent), followed by the South (26 percent) and the Rockies (21 percent). More than \$6 million (10 percent) of total primary product sales remained in-state, with lumber and other sawn products accounting for the majority (\$4.5 million). Mills distributed their products through their own distribution channels or through independent wholesalers and selling agents. Because of subsequent wholesale transactions, the geographic destination reported here may not reflect the ultimate delivery points of shipments.

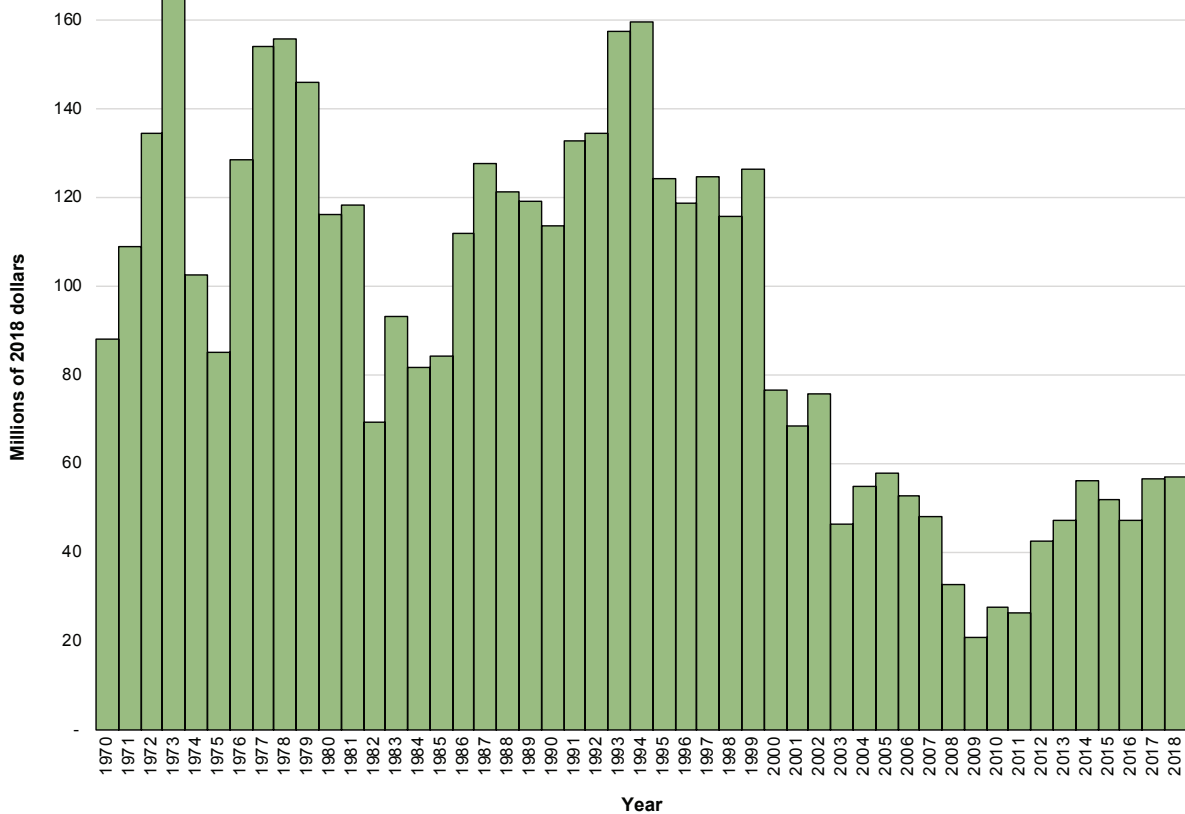


Figure 8—Wyoming lumber sales, 1970–2018 (source: WWPA 1947-2018).

**Table 23a**—Destination and sales value of Wyoming's primary wood products, 2018.

| Product                                 | Wyoming      | Rocky Mountains <sup>a</sup> | Far West <sup>b</sup> | North Central <sup>c</sup> | Northeast <sup>d</sup> | South <sup>e</sup> | Other Countries | Total         |
|---|--------------|------------------------------|-----------------------|----------------------------|------------------------|--------------------|-----------------|---------------|
| ----- Thousand 2018 dollars -----       |              |                              |                       |                            |                        |                    |                 |               |
| Lumber, timbers and associated products | 4,463        | 11,414                       | 1,615                 | 19,782                     | 1,725                  | 16,344             | 1,712           | 57,055        |
| Posts and poles                         | 1,283        | 1,425                        | 556                   | 582                        | —                      | —                  | —               | 3,847         |
| House logs and log homes                | 125          | 14                           | —                     | 14                         | —                      | —                  | —               | 152           |
| Other finished products <sup>f</sup>    | 238          | 641                          | 216                   | 860                        | 100                    | 100                | 100             | 2,256         |
| <b>All primary wood products</b>        | <b>6,109</b> | <b>13,494</b>                | <b>2,388</b>          | <b>21,237</b>              | <b>1,825</b>           | <b>16,444</b>      | <b>1,812</b>    | <b>63,309</b> |

**Table 23b**—Destination and sales value of Wyoming's primary wood products, 2018.

| Product                                      | Wyoming    | Rocky Mountains <sup>a</sup> | Far West <sup>b</sup> | North Central <sup>c</sup> | Northeast <sup>d</sup> | South <sup>e</sup> | Other Countries | Total      |
|--|------------|------------------------------|-----------------------|----------------------------|------------------------|--------------------|-----------------|------------|
| ----- Percent of sales -----                 |            |                              |                       |                            |                        |                    |                 |            |
| Lumber, timbers, and associated products     | 7.0        | 18.0                         | 2.6                   | 31.2                       | 2.7                    | 25.8               | 2.7             | 90.1       |
| Posts and poles                              | 2.0        | 2.3                          | 0.9                   | 0.9                        | —                      | —                  | —               | 6.1        |
| House logs and log homes                     | 0.2        | 0.0                          | —                     | 0.0                        | —                      | —                  | —               | 0.2        |
| Other finished products <sup>f</sup>         | 0.4        | 1.0                          | 0.3                   | 1.4                        | 0.2                    | 0.2                | 0.2             | 3.6        |
| <b>All primary wood products<sup>g</sup></b> | <b>9.7</b> | <b>21.3</b>                  | <b>3.8</b>            | <b>33.5</b>                | <b>2.9</b>             | <b>26.0</b>        | <b>2.9</b>      | <b>100</b> |

<sup>a</sup> Rocky Mountains includes Arizona, Colorado, Idaho, Nevada, New Mexico, Utah, and Montana.

<sup>b</sup> Far West includes Alaska, California, Hawaii, Oregon, and Washington.

<sup>c</sup> North Central includes Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin.

<sup>d</sup> Northeast includes Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, Pennsylvania, Rhode Island, and Vermont.

<sup>e</sup> South includes Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia.

<sup>f</sup> Other primary products include log furniture, wood pellets, firewood, and animal bedding.

<sup>g</sup> Percentage detail may not sum to 100 percent due to rounding.

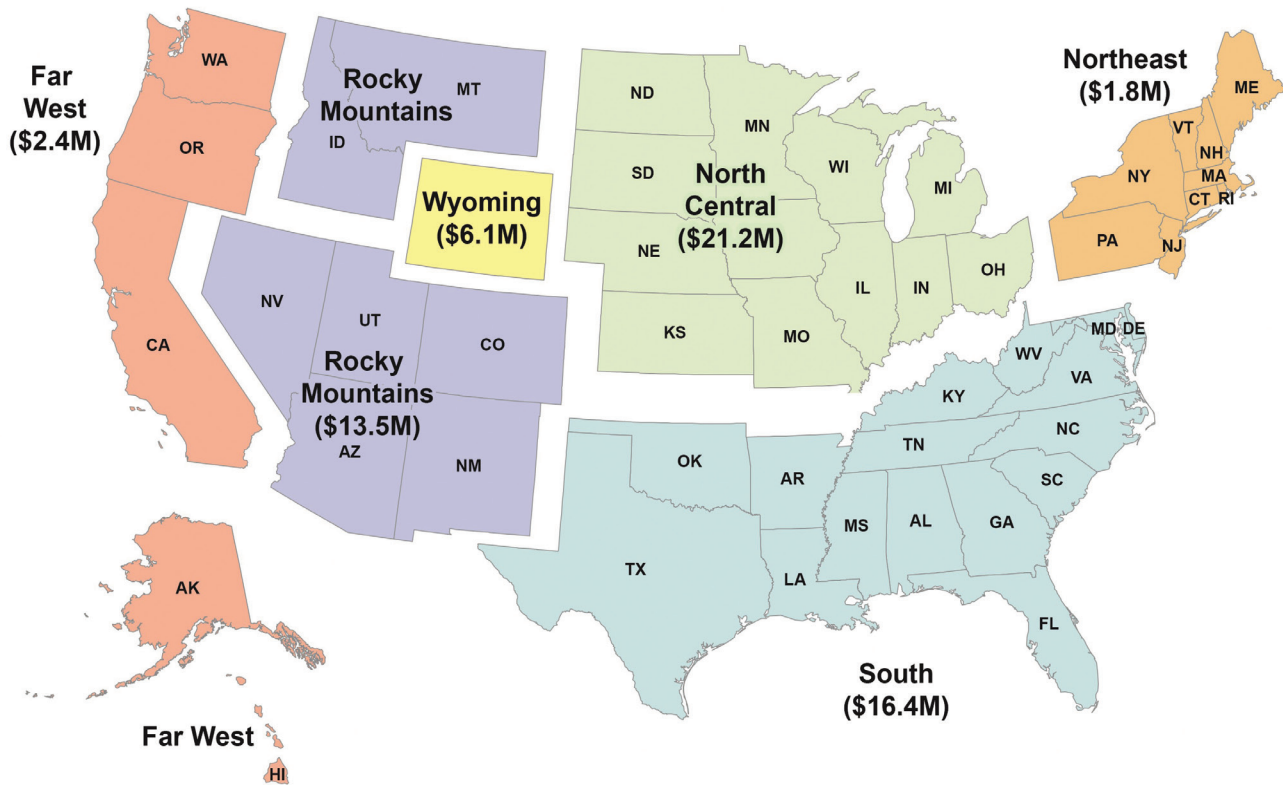


Figure 9—Destination and sales value of Wyoming's primary wood products.

## FOREST INDUSTRY EMPLOYMENT AND LABOR INCOME

Primary forest products manufacturers are just one component of the broader forest industry in Wyoming. The classification of forest industries used here follows the North American Industrial Classification System (NAICS), which is available online from the U.S. Department of Commerce. The forest industry in Wyoming consists of four sectors: NAICS 113 (forestry and logging), NAICS 1153 (forestry support activities), NAICS 321 (wood products manufacturing), and NAICS 322 (paper manufacturing). These latter two sectors include employees who work in both the primary and secondary wood products and paper manufacturing industries. Data from the U.S. Census Bureau's County Business Patterns (CBP) are used to distinguish between primary and secondary manufacturing employment and income.

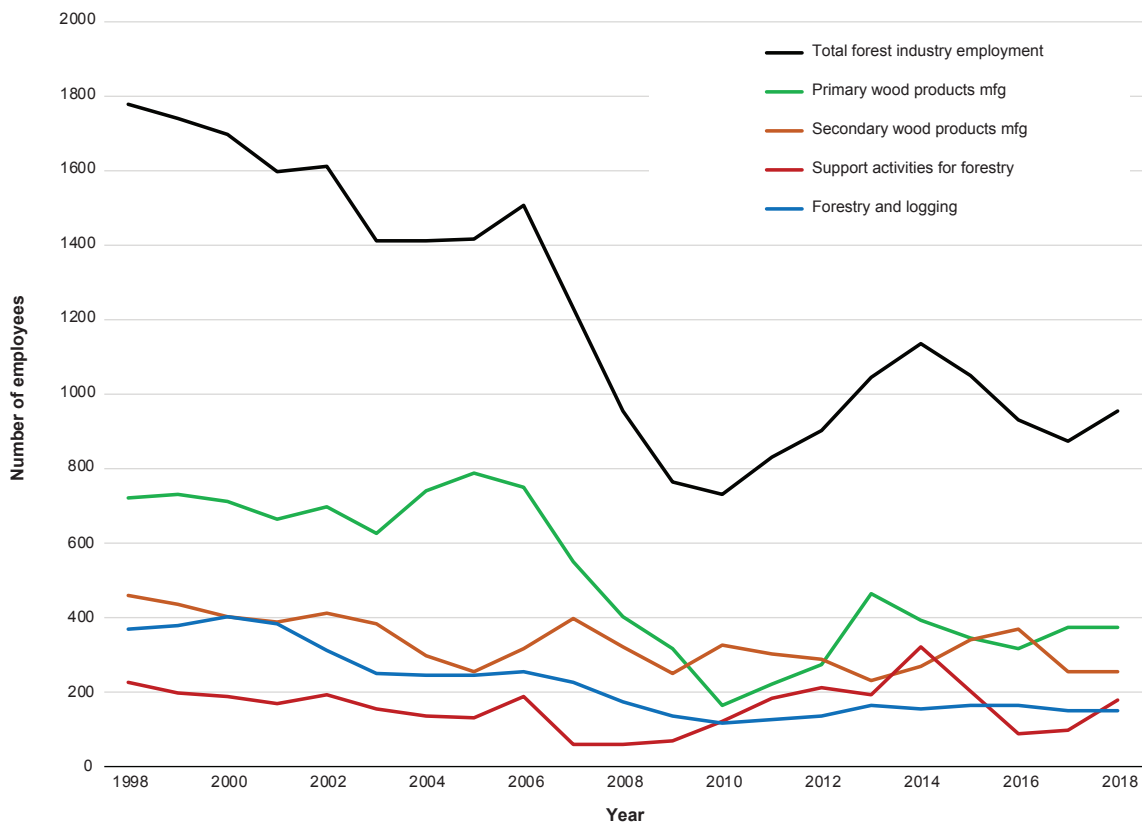
It should be noted that these four NAICS sectors provide a conservative estimate of total employment associated with the forest industry, as they do not reflect the additional employment created through the demand for services from log hauling companies, lumber and construction material wholesalers, road construction and maintenance contractors, and forest management services carried out by government agencies or nonprofit organizations.

Data from the Bureau of Labor Statistics (Quarterly Census of Employment and Wages, QCEW) are combined with data from the Bureau of Economic Analysis in order to determine the magnitude of the forestry support sector. Such public data sources (e.g., CBP) also provide a point of comparison for estimates of employment and labor income for the primary forest products manufacturing sector, as well as additional information on the larger forest industry.

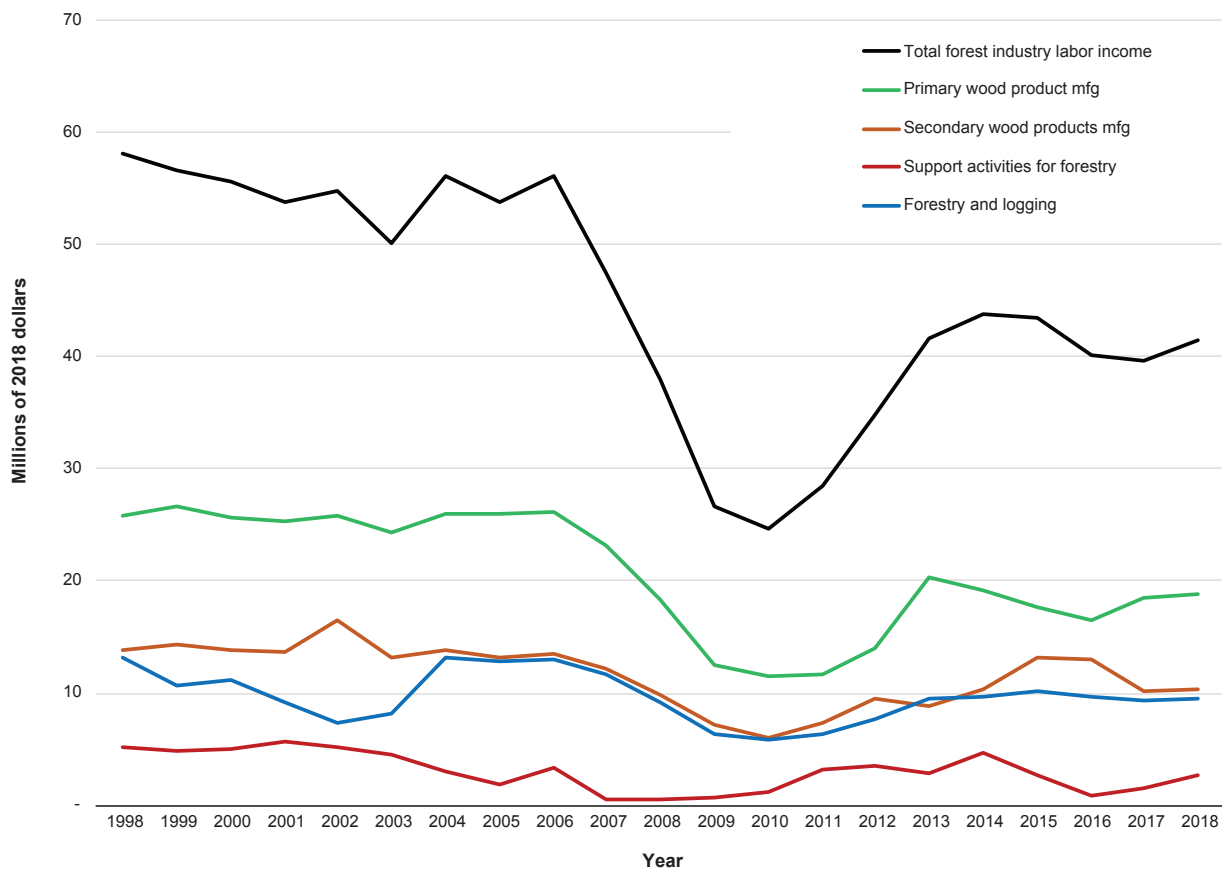
In 2018, total employment in the forest industry in Wyoming was an estimated 952 full- and part-time workers (USDC BEA 2020; USDC CB 2020; USDL BLS 2020). In addition to the approximately 372 workers employed in the manufacturing of primary wood products, an estimated 148 workers were employed in forestry and logging, 179 workers provided supporting activities for forestry operations, and the remaining 253 workers were employed in secondary manufacturing of wood products. Workers in the forest industry earned just over \$41 million (constant 2018 dollars) in labor income or worker earnings. Labor income includes wages and salaries, some benefits, and earning of the self-employed (figs. 10, 11).

Since 2014, employment in the Wyoming forest industry has dropped by 16 percent, from 1,136 to 952 workers. Labor income has experienced a smaller drop of 5 percent, from \$43.7 million in 2014 (in constant 2018 dollars) to \$41.4 million in 2018. The greatest drop in both employment and labor income occurred in the forestry support sector, where both went down by 44 percent over the 4-year period. This drop, however, masks an increase of over 100 percent since 2016, when sector employment dropped to 89 and labor income fell to below \$1 million.

Employment declines have outpaced drops in earnings in the forestry and logging sector since 2014, a trend indicating that while workers in the industry are laid off, those who remain are either working more/longer shifts, receiving higher pay than before, or a combination of both.



**Figure 10**—Forest industry employment, 1998–2018 (sources: USDC BEA 2018b; USDC CB 2017; USDL BLS 2018).



**Figure 11**—Forest industry labor income, 1998–2018 (sources: USDC BEA 2018a; USDC CB 2017; USDL BLS 2018).

Of the different forest industry sectors, forestry support has the lowest average annual income. The sector includes primarily seasonal workers, making many of the forestry support jobs only part-time. As a result, despite total industry employment dropping 16 percent, labor income dropped by much less (5 percent). Overall, forest industry sectors experienced small increases in average labor income between 2014 and 2018.

## CONTRIBUTION OF WYOMING’S FOREST INDUSTRY TO THE STATE’S ECONOMY

Economic contribution analyses measure gross changes in economic activity that can be associated with an industry, event, or policy on an existing regional economy (Watson et al. 2007). This report assesses the contribution of Wyoming’s forest industry as money spent on intermediate inputs, taxes, labor, and, in turn, by households, that generates economic opportunities as it cycles through the State’s economy.

Primary and secondary wood products manufacturers, and forestry, logging, and forestry support firms directly contribute approximately 952 jobs and \$41.4 million in labor income to the State. Using regional data and existing linkages within Wyoming’s economy represented by the Bureau of Economic Analysis’ (BEA) RIMS II multipliers<sup>1</sup>, BBER estimates that the wood products manufacturing sector alone supports more than

<sup>1</sup> The Bureau of Economic Analysis does not endorse any resulting estimates and/or conclusions about the contribution of a given sector on an area.



**Table 24**—Average annual employment and labor income contributions from Wyoming's forest industry, 2018.

| Sector                       | Direct employment                              | Indirect and induced employment | Total employment contribution <sup>a</sup> | Direct labor income               | Indirect and induced labor income | Total labor income contribution <sup>a</sup> |
|------------------------------|--|---------------------------------|--|-----------------------------------|-----------------------------------|--|
|                              | ----- Number of full- and part-time jobs ----- |                                 |  | ----- Thousand 2018 dollars ----- |                                   |  |
| Wood product manufacturing   | 625  | 698                             | 1,323                                      | 29,206                            | 36,494                            | 65,700                                       |
| Primary wood products mfg    | 372  | 582                             | 954  | 18,900                            | 30,975                            | 49,875                                       |
| Secondary wood products mfg  | 253  | 169                             | 422  | 10,306                            | 8,865                             | 19,171                                       |
| Forestry and logging         | 148  | 161                             | 309  | 9,587                             | 5,927                             | 15,514                                       |
| Forestry support activities  | 179  | 39                              | 218  | 2,612                             | 871                               | 3,483  |
| <b>Total forest industry</b> | <b>952</b>                                     | <b>a</b>                        | <b>a</b>                                   | <b>41,405</b>                     | <b>a</b>                          | <b>a</b>                                     |

Sources: USDC BEA 2018, 2020; USDC CB 2017; USDL BLS 2018.

<sup>a</sup>Indirect and induced employment and labor income should not be summed for multiple sectors due to some employment and income constituting both direct contributions to one sector and indirect contributions to other sectors.

698 full- and part-time jobs and an associated \$36.5 million in labor income (table 24). Thus, for every wood products manufacturing job in the State, another 1.1 jobs are supported in related sectors, while for every \$1 dollar paid in labor income by wood products manufacturers another \$1.25 is paid in supporting sectors.

Likewise, BBER estimates that the 148 people employed in forestry and logging support an additional 161 full- and part-time jobs in supporting sectors such as equipment sales and repair. Jobs within the forestry support activities sector have the smallest economic impact, supporting only 0.22 additional jobs per job within the sector.

It should be noted that we do not provide total indirect and induced employment and labor income for the entire forest industry to avoid double counting, since some employment and labor income contribute both directly to their sector as well as indirectly to other sectors.

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