



# Montana's Forest Products Industry and Timber Harvest, 2014

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## Part II: Industry Sectors, Capacity and Outputs

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### Introduction

This Resource Bulletin is part of a series of reports presenting findings from a census of Montana's primary forest products industry. Part II of the series presents information on the forest products sectors that processed timber and mill residue into finished products in 2014.

This survey effort is the eighth application of its kind in Montana and presents information from primary wood products manufacturers located both within the State, as well as facilities in surrounding States, that receive timber harvested from Montana. Primary forest product manufacturers are firms that process timber into manufactured products, such as lumber, plywood and facilities such as particle board plants that use the wood fiber residue directly from timber processors. Through a written questionnaire, phone or in-person interview, timber-processing and residue-utilizing facilities provided information about their 2014 operations, including:

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

In the event of nonresponse from a facility, data collected in previous surveys were updated using current data collected for facilities of a similar size, product type, and location as well as changes across the industry.

The University of Montana's Bureau of Business and Economic Research (BBER) and the USDA Forest Service's Forest Inventory and Analysis (FIA) Program at the Rocky Mountain Research Station (Ogden, Utah) cooperated in the analysis and preparation of this report. In collaboration with the FIA programs at the Rocky Mountain and Pacific Northwest Research Stations, BBER has developed the Forest Industries Data Collection System (FIDACS) to collect, compile, and make available State and county information on the operations of the forest products industry. Information collected from manufacturers is stored at the BBER in Missoula, Montana.

Additional information not presented here, including the full set of data tables, is available on our [website](#) and upon request. However, individual firm-level data are confidential and will not be released.

### Montana's Forest Products Industry

During 2014, Montana's primary forest products industry consisted of 102 active facilities. A majority of those facilities were located near forest resources in the Northwestern and Western portions of the State (fig. 1). These plants produced an array of products including: lumber and other sawn products, plywood, particleboard and fiberboard, house logs, posts, poles and rails, firewood, log furniture and fuel pellets. Total sales of finished products exceeded \$604 million in 2014, a 6 percent decrease (inflation-adjusted) from 2009.



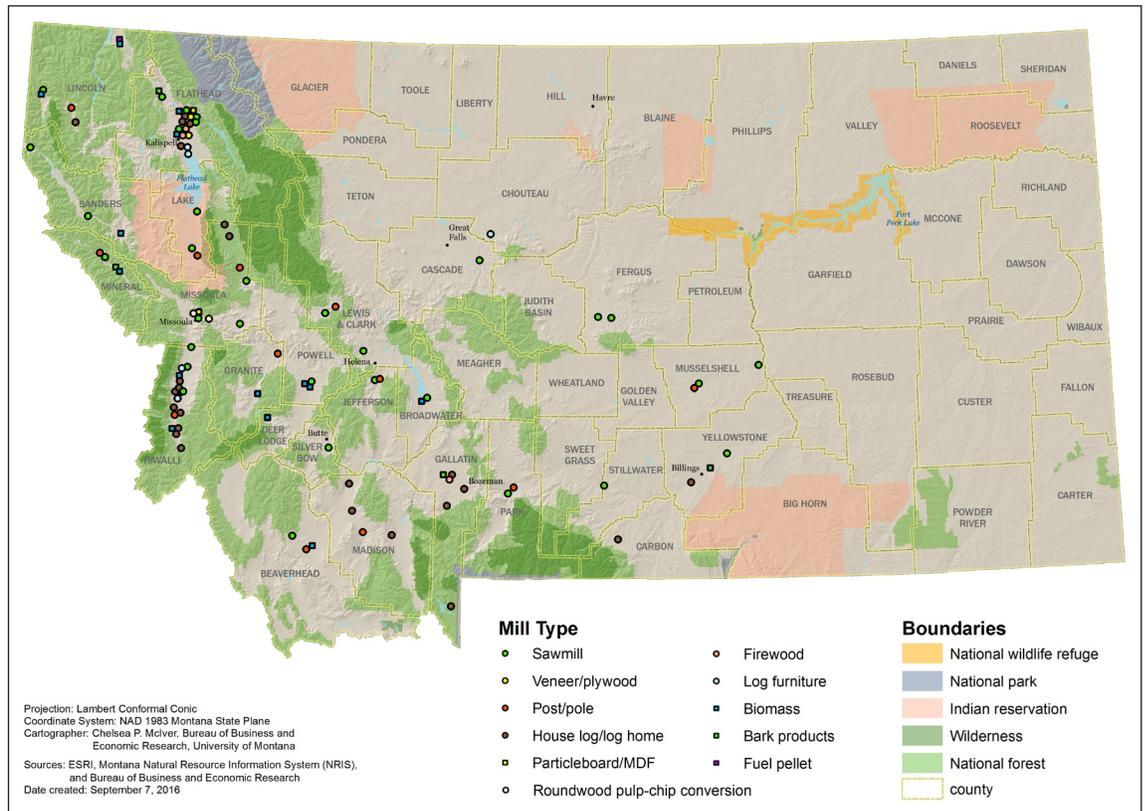


Figure 1—Montana’s primary forest products manufacturers, 2014.

There were 25 fewer facilities than the total number reported in the 2009 census (McIver et al. 2013). The sawmill sector, manufacturing lumber and related products, still had the largest number of facilities operating during 2014. Nearly all sectors experienced a decrease of active facilities. The log home sector, manufacturing log homes and house logs, experienced the sharpest decline both in number and percent, losing eight facilities or 24 percent since 2009.

The largest impact on the forest products industry in Montana was the permanent closure of the pulp mill in Frenchtown, which ceased operating in January of 2010. The loss of this facility had a major impact on employment and total product sales, and greatly reduced the ability of land managers to affordably treat forests containing small diameter, non-sawlog size timber. A roundwood chipping facility opened at the former Bonner mill site in 2013, but operates on a much smaller scale.

### Timber Received by Montana Mills

Montana mills received almost 437 million board feet (MMBF) Scribner of timber for processing during 2014 (table 1). Timber receipts refers to the volume of timber delivered to Montana mills from both in-State and out-of-State sources. Timber receipts at Montana mills differed from the State’s timber harvest because some timber harvested in Montana was processed in other States and some of the timber processed in Montana was harvested outside the State.

Private timberlands contributed 60 percent (263 MMBF) of the volume processed by Montana mills during 2014, up slightly from 55 percent (201 MMBF) in 2009, but down considerably from the 74 percent (555 MMBF) in 2004. Public timberlands provided the remaining 40 percent (171 MMBF), down from 45 percent in 2009.

**Table 1**—Timber received by Montana facilities by ownership class and product, 2014.

Ownership class	Saw and veneer logs	House logs	Other products <sup>a</sup>	All products
----- Thousand board feet, Scribner -----				
<b>Private</b>	<b>240,504</b>	<b>1,701</b>	<b>21,149</b>	<b>263,354</b>
Industrial and Tribal <sup>b</sup>	85,544	734	4,129	90,407
Non-industrial private	154,960	967	17,020	172,947
<b>Public</b>	<b>144,896</b>	<b>910</b>	<b>24,671</b>	<b>170,477</b>
National Forest	79,486	593	17,899	97,978
Other public	65,410	317	6,772	72,499
<b>Canadian and unspecified<sup>c</sup></b>	<b>933</b>	<b>1,852</b>	<b>0</b>	<b>2,785</b>
All owners	386,333	4,463	45,820	436,616

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

<sup>b</sup>Industrial and Tribal combined to prevent disclosure.

<sup>c</sup>Includes timber received from Canada and unspecified out-of-state owners.

As in previous years, sawlogs and veneer logs constituted the vast majority (88 percent) of Montana’s timber receipts. Logs used for other timber products, including posts and poles, house logs, log furniture, pulpwood, and industrial fuelwood, accounted for 12 percent of receipts in 2014 versus 28 percent in 2009, but closer to the 11 percent in 2004. Canada and other out-of-State sources provided the largest share of house logs in 2014. The decreasing proportion of other timber products for 2014 was due to a combination of factors, including the closure of the pulp mill in 2010, a marked increase in the total volume of timber harvested and processed in Montana, and better markets for wood products. This led to increased log demand by Montana’s lumber and plywood sector.

## Trends by Sector

### Lumber and Plywood

The lumber and plywood sector is the largest sector of Montana’s primary forest products industry in terms of the number of facilities, employment and the volume of timber processed. Montana’s 32 sawmills produced 611 MMBF (lumber tally) of lumber and other sawn products in 2014. The two plywood plants produced 167 MMSF 3/8” of plywood (Plum Creek 2015). Combined sector sales were about

\$343 million, 57 percent of the total sales value of Montana’s primary wood products. This is an 80 percent increase over 2009 when inflation adjusted sales were \$190 million (table 2).

Lumber is the most common product at Montana sawmills, although small amounts of structural timbers and other specialized products, such as flooring, siding, molding and paneling are also produced. About 73 percent of the lumber produced is dimension lumber used in construction applications. Plywood plants in Montana generally produce specialized plywood for RVs and boat construction.

Lumber production in Montana peaked in the 1980s and has been in decline since (fig. 2), following similar trends experienced in other western States (McIver et al. 2013 and 2015; Sorenson et al. 2016). Due to limited timber availability and declining harvest volumes from federal and private lands, lumber production declines continued into the first decade of the 21st century despite very strong housing and lumber markets in 2004 and 2005. The housing and lumber markets bottomed out in 2009 (Keegan et al. 2012), seriously impacting Montana’s remaining forest products industry. The industry began a slow recovery in 2010 and 2011, but by 2014 timber harvest and lumber production had not returned to pre-recession levels.



**Table 2**—Sales value of Montana's primary wood products, selected years. (sources: Keegan 1980; Keegan and others 1983, 1990, 1995, 2001; McIver and others 2013; Spoelma and others 2008).

Product	1981	1988	1993	1998	2004	2009	2014
----- Thousand 2014 dollars -----							
Lumber and other sawn products	524,168	692,433	1,063,045	662,047	773,775	10,032	42,635
Plywood	219,292	190,029	284,696	282,701	<sup>a</sup>	<sup>a</sup>	<sup>a</sup>
Pulp, paper, particleboard, fiberboard and other residue related products	499,889	659,157	557,669	476,839	560,028	05,034	20,143
House logs	18,079	53,129	91,537	136,041	99,361	2,879	2,369
Other finished products <sup>b</sup>	51,446	19,637	20,622	19,219	21,388	6,278	9,424
<b>Total</b>	<b>1,312,873</b>	<b>1,614,384</b>	<b>2,017,569</b>	<b>1,576,848</b>	<b>1,454,551</b>	<b>644,224</b>	<b>604,571</b>

<sup>a</sup>Plywood sales value combined with lumber to prevent disclosure.

<sup>b</sup>Other products include post and poles, industrial fuelwood, and log furniture.

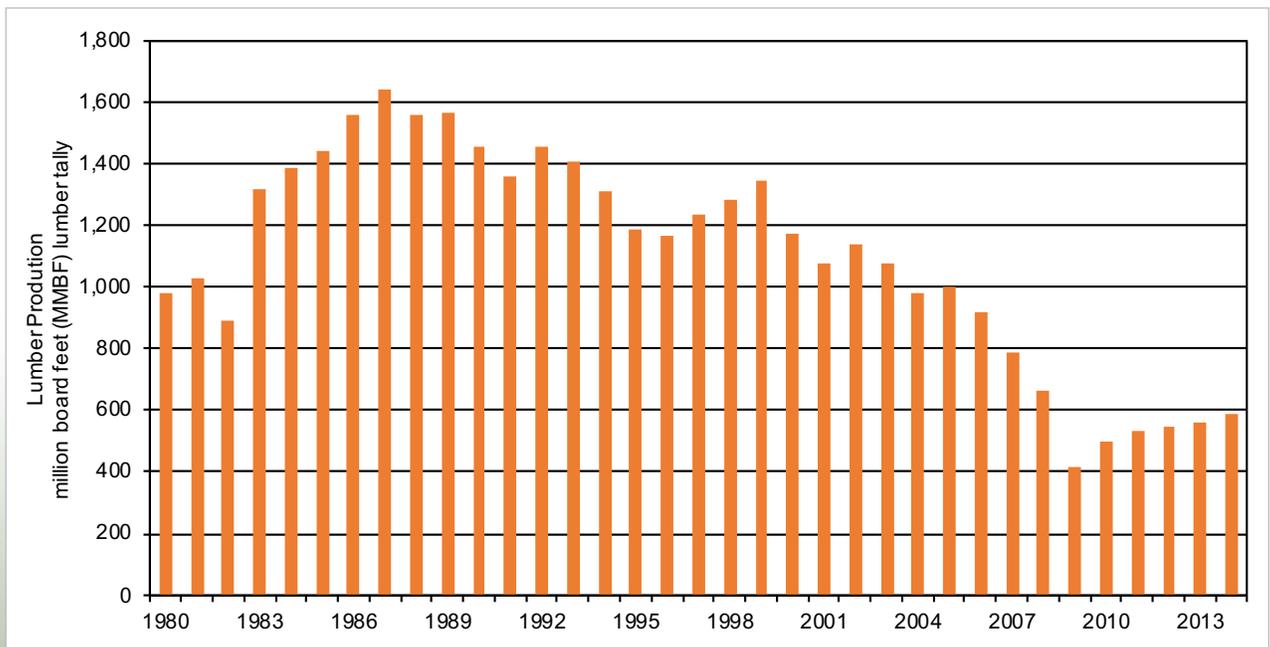


Figure 2—Montana lumber production, 1980-2015 (Source: WWPA 1980-2016).

Lumber production varied considerably among Montana’s sawmills. The 23 smallest sawmills had a combined production of 13 MMBF, about 2 percent of the State’s 2014 lumber output. The State’s nine largest sawmills accounted for 98 percent (598 MMBF) of lumber output in 2014.

The volume of sawtimber used by Montana’s sawmills in 2014 was approximately 85.9 million cubic feet (MMCF) and lumber production was 611 MMBF lumber tally. Thus, the statewide lumber recovery factor (LRF) for Montana sawmills in 2014 was 7.11

board feet of lumber output per cubic foot of log input, down from 7.35 in 2009—a decline from the recovery achieved in 2004 of 7.26. While increases in LRF tend to be associated with improvements in technology, the declines in LRF from 2004 and 2009 were most likely caused by the closure of a couple of larger sawmills that had higher than average recovery rates.

With lumber production of 611 MMBF lumber tally, up from 337 MMBF Scribner of timber, statewide overrun in Montana averaged 1.81 in 2014. Like LRF, overrun also declined

from 2004 (2.00) and 2009 (1.89), and may be attributable to the closure of mills with higher overruns. Unlike LRF, overrun is influenced by the size of logs processed and mill specifications. As log diameters decrease, the Scribner log rule underestimates by an increasing amount the volume of lumber that could be produced from a log, thus contributing to historic overrun increases (Keegan et al. 2010). During the strong lumber markets of 2004, Montana sawmills likely used a higher proportion of smaller logs than during the very poor lumber markets of 2009.

The amount of wood and bark residue generated per unit of lumber produced decreased as sawmills improved their recovery using log scanning and optimizing, thinner kerf saws, curved-sawing and other technology.

### Log Homes

The Great Recession (2007-09) and the related collapse in the U.S housing market impacted Montana's log home industry more severely than any other sector of the State's wood products industry. The number of log home manufacturers in Montana continued to decline from 88 in 2004 to 33 in 2009, then to 25 in 2014. Along with the decrease in the number of log home manufacturers, sales dropped from \$99 million in adjusted dollars for 2004 to \$22 million in 2014, about 4 percent of Montana's total sales for 2014. Log homes tend to be specialized items resulting in an industry highly tied to regional and national economic influences. However, with relatively low capital costs, many inactive facilities could once again produce house logs and homes as demand increases.

### Other sectors

Other sectors of Montana's primary forest products industry, include manufacturers of posts, poles, log furniture, firewood, chipping facilities, and facilities that utilize mill residues.

The post, pole, and other roundwood product sector consists of manufacturers of fence

posts, small poles, and rails used in fence construction. There were 12 active facilities during 2014 compared with 14 in 2009. The log furniture sector has also seen a decrease in the number of facilities since 2009. During 2014, five log furniture manufacturers operated in Montana as compared to 14 in 2009. There is considerable turnover in this sector as very little capital or equipment is required to manufacture log furniture, making it easy to start up and stop operation. The combined 2014 sales value for these firms was about \$20 million—3 percent of total Montana sales.

In 2014, Montana's residue-utilizing sector consisted of one particle board plant, one medium-density fiberboard (MDF) plant, one fuel pellet plant, four producers of bark and landscape products, and 14 facilities that utilized mill and other residues to produce heat for public schools. Sales value for 2014 was near \$219 million, about 36 percent of Montana's 2014 total sales value. Inflation adjusted sales from the sector was \$405 million in 2009, representing a 46 percent decrease, highlighting the economic contribution of the closed paper mill. The primary input for most of these facilities is wood residue produced as a byproduct from manufacturing other wood products, most notably lumber and plywood. These facilities play an important role in Montana's forest products industry not only for the employment and products that they provide, but also as purchasers of residue from sawmills and plywood plants.

### Timber-processing Capacity

Montana timber processors provided their eight-hour shift and annual production (output) capacities, given sufficient supplies of raw materials and firm market demand for their products. To estimate the primary industry's total timber-processing capacity, production capacity was divided by recovery for each facility and expressed in units of timber input (MMBF Scribner). For example, sawmill capacity figures were calculated by



dividing lumber production capacity by the mill’s calculated lumber recovery (board feet of lumber per board foot Scribner of timber).

Montana’s timber-processing capacity in 2014 was 635 MMBF Scribner, of which 62 percent was utilized (fig. 3). Sawmills accounted for almost 550 MMBF Scribner (86 percent) of timber-processing capacity. There has been a 60 percent drop in capacity to process timber in Montana since 1988, when capacity was estimated at nearly 1,561 MMBF. Montana’s capacity utilization has historically averaged around 75 percent. It reached as high as 87 percent in 1998, but dropped to an all-time low of 46 percent in 2009. Declines in capacity and utilization, which started in the late 1980s, have been attributed in part to decreases in the volume of timber offered from federal lands (Keegan et al. 2006) and reductions in private industrial timberland acreage and harvest. The housing bust and recession drove capacity and utilization to the 2009 low. Improving wood products markets and rising timber harvest on private and State lands in the region have enabled facilities to continue operation and increase operating levels over the past few years.

### Mill Residue

As indicated in Part I of this series, about half of the wood fiber processed by primary forest products manufacturers ends up as mill residue. This residue presents a difficult and expensive disposal problem, or it can be used to produce products and generate additional revenue. The three types of wood residues include: course residue (chips, slabs, edging, trim and log ends), fine residue (planer shavings and sawdust), and bark.

Montana’s primary forest product manufacturers generated 679,129 bone dry units (BDU) (table 3) of mill residue in 2014, a 21 percent increase from 2009. In 2014, 99.5 percent of this residue was utilized, a small change from the 99.8 percent utilization in 2009. This small decline in residue utilization can be attributed to the increase in the total volume of residue generated and the inability of small facilities to dispose of the residue in an economical fashion.

Almost three-quarters (72%) of Montana’s mill residue went to pulp and reconstituted board plants. Another 21 percent (142,325

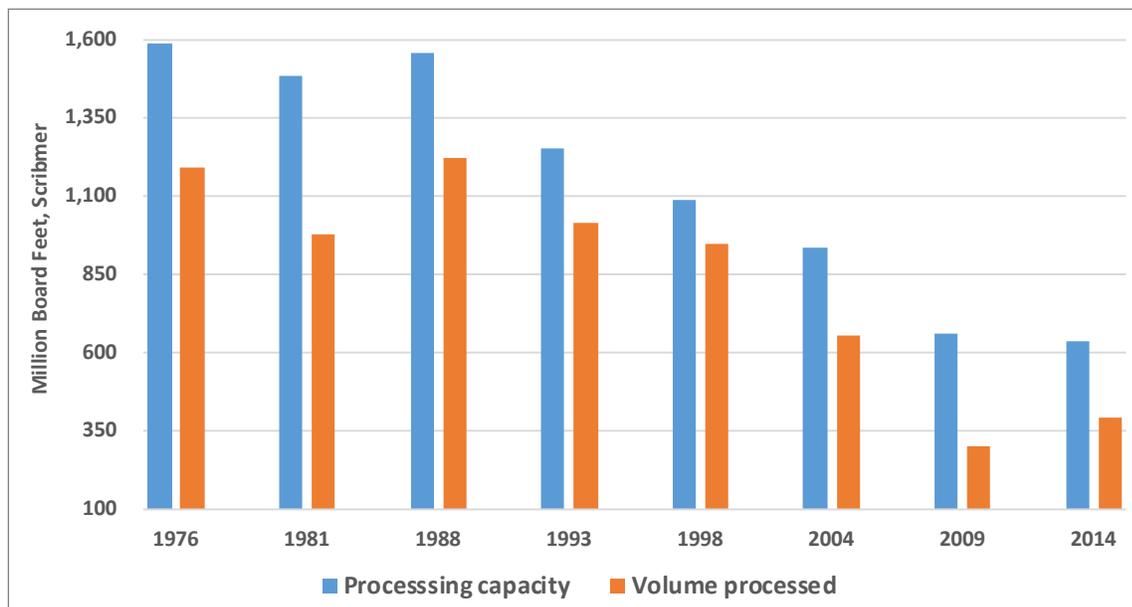


Figure 3—Montana timber-processing capacity, selected years.

**Table 3**—Production and disposition of residues from Montana's primary wood products sectors, 2014.

Sector	Total utilized	Pulp and particle board	Energy	Mulch or animal bedding	Unspecified use	Unutilized	Total produced
----- Bone dry units <sup>a</sup> -----							
Lumber, plywood and other sawn products	641,427	487,216	115,142	36,579	2,490	1,815	643,242
House logs and log homes	4,326	-	3,343	323	660	506	4,832
Posts and poles	14,572	1,300	8,737	4,384	151	1,116	15,688
Other sectors <sup>b</sup>	15,295	-	15,103	190	2	72	15,367
All sectors	675,620	488,516	142,325	41,476	3,303	3,509	679,129

<sup>a</sup>Bone dry unit= 2,400 lb oven-dry wood.

<sup>b</sup>Other sectors include firewood, pulp chipping and log furniture.

BDU) 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, schools or other facilities. About 6.5 percent of residue was used for animal bedding, mulch and decorative bark or other unspecified uses, with the remaining 0.5 percent (3,509 BDU) not used.

**Related Tables and Figures (see Part IV):**

- Figure 1—Montana’s primary wood products manufacturers, 2014.
- Table 10—Active Montana primary wood products facilities by county and product during 2014 and other years.
- Table 11—Proportion of timber received by Montana facilities (MBF, Scribner) by ownership class, selected years.
- Table 12—Timber received by Montana facilities by ownership class and product, 2014.
- Table 13—Proportion of timber received by Montana facilities (MBF, Scribner) by product, selected years.
- Table 14—Timber received by Montana facilities by species and product, 2014.
- Table 15—Timber received by Montana facilities by ownership class and species, 2014.
- Table 16—Montana lumber overrun and lumber recovery factor (LRF), selected years.
- Table 17—Number of Montana sawmills by annual lumber production, selected years.
- Table 18—Proportion of Montana lumber production by sawmill size class, selected years.

- Table 19—Lumber production by Montana sawmills, 2014.
- Table 20—Sawtimber processing capacity and utilization, selected years
- Table 21—Montana sawmill residue factors, selected years.
- Table 22—Production and disposition of residues from Montana sawmills and plywood plants, 2014.
- Table 23—Production and disposition of residues from Montana’s primary wood products sectors, 2014.
- Table 24—Proportion of finished product sales of Montana’s primary wood products sectors, selected years.

See also, Part I: Timber Harvest, Products and Flow (RMRS-RB-32-1), Part III: Sales, Employment and Economic Contribution (RMRS-RB-32-3), and Part IV: Montana 2014 Data Tables and Figures (RMRS-RB-32-4).

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