



Alaska's Forest Products Industry and Timber Harvest, 2015

Part 3: Sales, Employment, and Contributions to the Statewide Economy

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Introduction

This resource bulletin is part of a series of reports presenting findings from a census of Alaska's primary forest products industry. Part 3 of the series presents information on sales value and employment associated with primary wood products manufacturing, the economic contribution of forest products manufacturing in the state, and an analysis of the changes in the broader forest industry over time. All dollar figures included have been adjusted for inflation to constant 2015 dollars, unless otherwise noted.

This survey effort is the third application of its kind in Alaska (Berg et al. 2014, Halbrook et al. 2009), and presents information collected from a census of primary manufacturers in the state that receive timber harvested in Alaska. Primary forest product manufacturers are businesses that process timber into products such as lumber, as well as facilities such as wood pellet plants that use the wood fiber directly from timber processors. Using a written questionnaire, or a telephone or in-person interview, timber-processing and residue-utilizing facilities provided information about their 2015 operations for the following:

- Plant location, production capacity, and employment
- Volume of raw material received by county and ownership origin
- Species of timber volume received and corresponding live/dead proportions

- Finished product volumes, types, sales value, and market locations
- Volume, utilization, and marketing of manufacturing residue

For facilities that did not respond to the survey, data collected in previous surveys were updated using current data collected for facilities of a similar size with a similar product type and location, as well as information on market trends and prices. For the 2015 Alaska mill census, data were received for 51 of the 60 active, in-state facilities, which accounted for 85 percent of primary manufacturers. While some collected facility data required estimation methods to finalize, 80 percent of the harvest volume in 2015 was captured through quantitative methods.

The University of Montana's Bureau of Business and Economic Research (BBER) and the U.S. Department of Agriculture (USDA), Forest Service, Pacific Northwest Research Station's Forest Inventory and Analysis (FIA) program cooperated in the analysis and preparation of this report. With the FIA programs at the Pacific Northwest and Rocky Mountain Research Stations, BBER has developed the Forest Industries Data Collection System to collect, compile, and make available state and county information on forest products industry operations. Because this study is based on a census, rather than a statistical sample of businesses, there is no statistical error associated with the estimates presented. Possibilities

of reporting and measurement errors exist but are minimized by cross-checking data against other public and private information sources, and by checking the data for internal consistency. Summary data tables and figures are reviewed by wood products researchers, state and federal agency personnel, and members of the state's forest products industry. However, company-level data are confidential and will not be released.

Alaska's Primary Product Sales Value and Markets

The 2015 mill census identified 60 active primary forest products manufacturers in Alaska that produce an array of products, including lumber and other sawn products, house logs, fuelwood, tonewood (wood for making musical instruments), cedar products, and wood pellets. Alaska's forest industry reported an estimated total sales value of primary wood products, international log exports, and residue-related products of more than \$114 million dollars, free on board (or f.o.b.) the producing mill (table 1). This represented a 19-percent decrease from the \$141 million in sales reported in 2011 (Berg et al. 2014). A similar decline in sales value was observed from 2005 to 2011, and total sales value in 2015 was approximately 35 percent lower than in 2005 (Halbrook et al. 2009).

Excluding residues and log exports, the sales value generated by the primary wood products industry exceeded \$23 million in 2015. In contrast to the overall decline in total forest industry sales value, sales by Alaska manufacturers increased approximately 28 percent over 2011 primary product sales. The majority (66 percent) of wood products

manufactured in Alaska were sold within the state, a proportional decrease relative to in-state sales in 2011 (73 percent). Lumber and other sawn products accounted for more than half (52 percent) of total primary product sales. About 49 percent of all lumber produced in Alaska was sold within the state, down from 56 percent in 2011, while sales of lumber to west coast states accounted for 39 percent, up from 33 percent.

In 2015, a majority (86 percent) of the primary products other than lumber manufactured in Alaska were sold within the state. This represented a decrease from the proportion of other products—house logs, firewood, cedar products, and tonewood—sold in-state in 2011 (nearly 92 percent). In 2015, out-of-state markets accounted for an increasing proportion of other product sales. Within the “other product” category, cedar and tonewood products accounted for the majority of out-of-state and international sales. Manufactured house log and log home products accounted for approximately \$5.5 million in in-state sales.

While some of the residues generated from the manufacturing of primary wood products in 2015 remained unused, more than 31,000 bone-dry units (BDU)¹ were repurposed and sold in the form of firewood, garden mulch, animal bedding, and wood chips used for playground fill and landscaping. Estimated sales generated from residues dramatically increased from 2011 (\$1.2 million) to 2015 (\$4.9 million). Approximately 40 percent of utilized residues were coarse residue—including chips, edgings, slabs, cull sections of logs, and log ends—sold as pulp chips to out-of-state markets.

¹ One bone-dry unit (BDU) equals 2,400 pounds (1088.6 kilograms) of oven dry wood.

Table 1—Destination and sales value of Alaska's primary wood products, residue, and exports, free on board the producing facility in 2015

Product	Alaska	West coast ^a	Other states	Pacific Rim	Canada	2015 total
----- Thousands of 2015 dollars -----						
Lumber	5,897	4,708	633	891	38	12,167
Other ^b	9,531	723	454	250	190	11,147
Total primary product	15,427	5,431	1,087	1,141	228	23,314
Residues ^c						4,886 ^e
Sawlog and pulpwood exports ^d						86,207 ^e
2015 total sales value						114,407
2011 total sales value ^f						141,158
2005 total sales value ^g						177,278

Note: Totals may not sum because of rounding.

^aWest coast states include California, Hawaii, Oregon, and Washington.

^bOther products include house logs, firewood, wood pellets, cedar products and tonewood.

^cResidue products include firewood, garden mulch, animal bedding and wood chips for park/playground fill and landscaping.

^dUnited States International Trade Commission (USITC) Dataweb tool.

^eData pooled across destinations to prevent disclosure of confidential information.

^fFrom Berg et al. (2014).

^gFrom Halbrook et al. (2009).

International exports of sawlogs and chipped roundwood eclipsed all other sales in 2015. As mentioned in parts 1 and 2 of this series, most timber harvested in Alaska is exported. Log and chip exports accounted for 75 percent (\$86 million) of Alaska's total wood products sales value in 2015. This represented a decrease from the 2011 estimated export sales value of \$121 million (29 percent). In 2011 and 2015, the vast majority of log exports were shipped to Pacific Rim countries, predominantly China (USITC 2016). The decrease in exported log volume, as well as shifts in global log market prices, resulted in the overall decrease in total sales value from Alaska's forest products industry from 2011 to 2015 (fig. 1). While the value of log exports to China increased approximately 6 percent from 2011 to 2015, exports to Japan fell 50 percent and exports to Korea decreased by 69 percent. However, over the same period, Alaska mills were able to increase lumber production and generate higher sales (table 1), indicating some

flexibility to shift away from unfavorable international log export markets to domestic production.

While overall log export value decreased, the average value (dollars/thousand board feet [MBF]) to all countries increased from 2011 to 2015, with the exception of Canada (USITC 2016). Similarly, the combined average value across all export species increased from \$673/MBF in 2011 to \$851/MBF in 2015 (USITC 2016). Sitka spruce (*Picea sitchensis* (Bong.) Carrière) accounted for 74 percent of log export sales in 2015, while western redcedar (*Thuja plicata* Donn ex D. Don) had the highest average value at more than \$1,400/MBF (USITC 2016). Between 2011 and 2015, several shifts were observed across Alaska log exports species composition and destination country (table 2). Average price increased from 2011 to 2015 for Sitka spruce and western redcedar, while western hemlock (*Tsuga heterophylla* (Raf.) Sarg) saw a slight decrease. Alaska log exports to Korea fell in

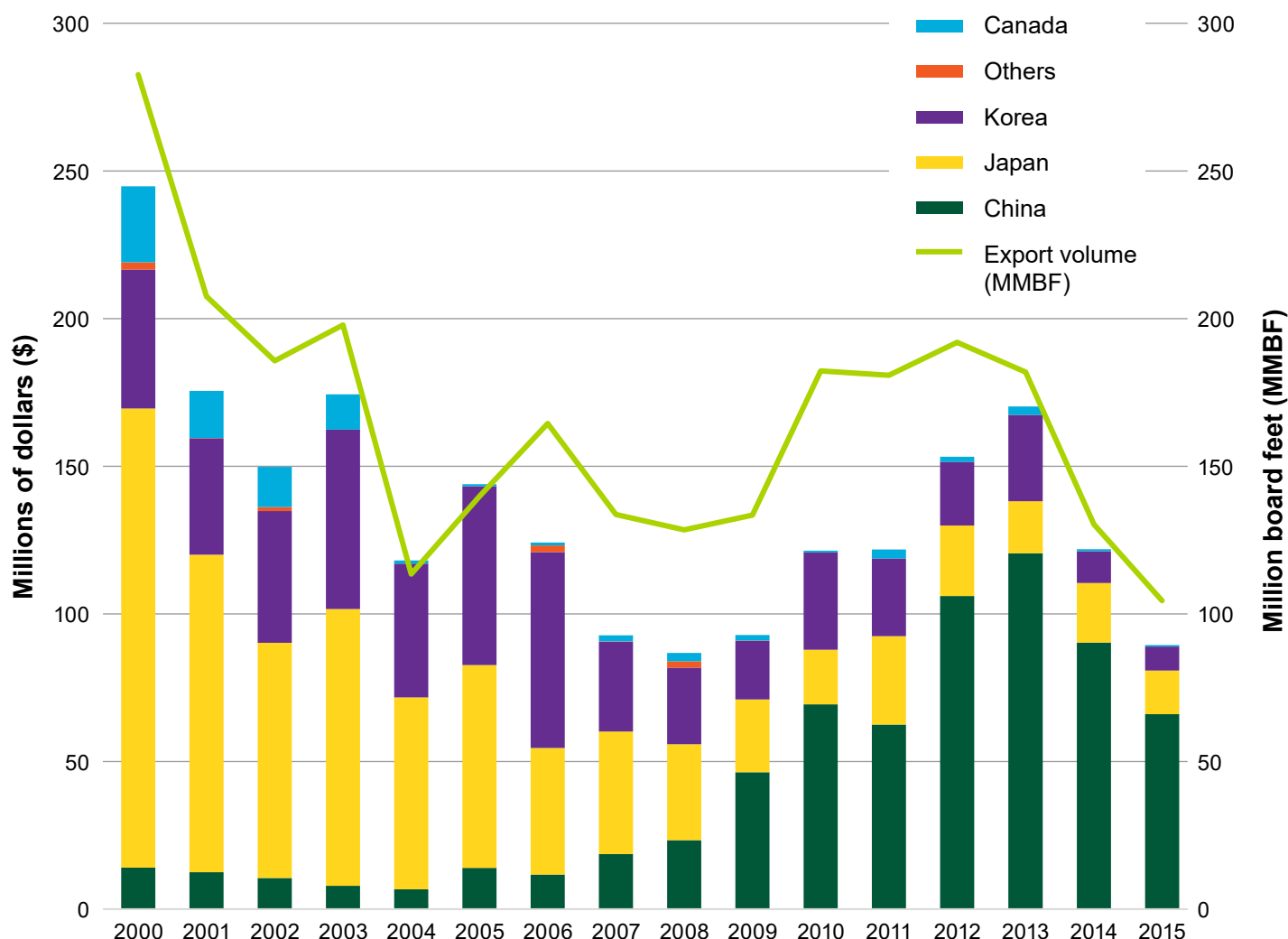


Figure 1—Total value of Alaska log exports (inflation-adjusted 2015 millions of dollars) by destination country and total export volume (MMBF), 2000 to 2015 (USITC 2016). Volumes from USTIC (2016) converted using 7.0 m³/MBF (Daniels et al., in press).

2015, predominantly in spruce (100 percent decline) and western hemlock (47 percent decline). However, the proportion of exported redcedar logs destined for Korea increased nearly 73 percent from 2011 to 2015. Similarly, while Japan received a smaller proportion of exported spruce and hemlock logs, western redcedar exports increased approximately 30 percent. Conversely, China received a higher proportion of both spruce (49 percent increase) and hemlock (68 percent increase) in 2015, while receiving no red cedar log exports by 2015 (USITC 2016). Shifts in global log export

markets and changes in demand by destination and species continue to influence the log export sector of Alaska's forest industry.

Alaska's Forest Industry Employment and Labor Income

The primary forest products manufacturers characterized in BBER's periodic census are just one component of the broader forest industry in Alaska. The classification of the forest industry sectors used here follows the North American Industry Classification System (NAICS) available online via the U.S. Department of Commerce Bureau of

Table 2—Proportion of Alaska log exports by species and destination country in 2011 and 2015^a

Country:	Sitka spruce		Western hemlock		Western redcedar	
	2011	2015	2011	2015	2011	2015
China	57%	84%	42%	70%	12%	0%
Japan	23%	16%	23%	11%	39%	51%
Korea	20%	0%	35%	19%	28%	48%
Canada	0%	0%	0%	0%	20%	1%
Average price (\$/MBF) ^b	601.58	826.67	829.05	820.57	1,294.45	1,464.36

Note: Totals may not sum because of rounding. MBF = thousand board feet.

^aSource: USITC (2016)

^bUSITC export volumes were converted using a derived factor of 7.0 m³/MBF

Economic Analysis (BEA) website.² Alaska's forest industry can be described using three categories: NAICS 113—forestry and logging, NAICS 321—wood products manufacturing, and NAICS 322—paper manufacturing. Paper manufacturing data refers to historical employment levels in Alaska's forest industry. These categories include employees who work in both the primary and secondary wood products and paper manufacturing sectors. It should be noted that these NAICS categories likely underestimate total employment in the forest industry because they do not include log hauling (trucking) companies, lumber and construction material wholesalers, road construction and maintenance contractors, and forest management services performed by government agencies or nonprofit organizations. These publicly available data provide another point of comparison for estimates of employees and labor income for the primary forest products manufacturers to compare with BBER survey data, as well as additional information on the larger forest industry.

Alaska forest industry employment trends have generally paralleled changes in timber harvest volume through time (Berg et al. 2014, Halbrook et al. 2009). Both timber harvest and employment in the forest industry peaked in 1989 and 1990, with more than 4,200 workers (Halbrook et al. 2009). The once-robust pulp and paper sector in Alaska experienced a dramatic drop in employment with the closure of pulp mills in the late 1990s (Berg et al. 2014, Halbrook et al. 2009), and employment in the pulp and paper industry has since ceased. Forestry and logging employment experienced a decline in the early 2000s in response to the termination of the Forest Service's southeast Alaska 50-year timber sale contracts (Alexander 2012, Berg et al. 2014). In 2005, approximately 1,451 workers were employed across the forest industry (wood products manufacturing, forestry, and logging), exhibiting an increase over previous years in response to the housing boom of 2004 and 2005 (Berg et al. 2014). However, by 2011, combined employment in wood products manufacturing, forestry, and logging had fallen

²For this report, BEA estimates from 1990 to 1998 were based on previously published data (Berg et al. 2014, Halbrook et al. 2009) to bridge the shift from standard industrial classification (SIC) codes to North American Industry Classification (NAICS) codes. From 1998 through 2015, the most recent BEA data were used (USDS BEA 2016a, 2016b).

approximately 30 percent to 1,015 workers. Employment in the forest industry grew steadily in the years following 2011, reaching 1,252 workers in 2014 (fig. 2).

In 2015, total employment in the combined sectors of wood products manufacturing, forestry, and logging was an estimated at 1,213 full- and part-time workers (fig. 2) (USDC BEA 2016b). Of these, approximately 702 workers (58 percent) were employed in the wood products manufacturing sector. In addition, we estimate that 511 workers were employed in forestry and logging in 2015.

In addition to the previously mentioned industrial sectors, NAICS 1153—agricultural and forestry support activities, is also a component of the forest industry. Support activities have not been included in previous BBER Alaska industry reports, and BEA data were not sufficient to generate reasonable estimates for forestry support employment in Alaska throughout the entire time series shown in figure 2. In 2011, an estimated 263 workers were employed in support activities for forestry³—increasing the estimate for total forest industry employment to approximately 1,278 workers. By 2015, employees engaged in support activities for forestry increased to 367 workers, bringing the total forest industry employment for 2015 to 1,580 workers.

Workers in the forest industry earned \$111 million in labor income or worker earnings in 2015 (USDC BEA 2016a). Labor income includes wages and salaries, some benefits, and earnings of the self-employed. Employees in forestry and logging earned approximately \$64 million, while workers in the wood products manufacturing sector earned \$42 million. Employees in support activities for forestry

earned approximately \$5.5 million. Since 2005, inflation-adjusted earnings across all sectors have increased, with earnings in the forestry and logging sector approximately 38 percent higher in 2015, while wood products manufacturing earnings increased nearly 150 percent. This trend of rapidly increasing earnings may indicate that existing workers in the forest industry are working more days out of the year in 2015 relative to 2005, likely in parallel to increased lumber production in the state. The average wood products manufacturing employee earned \$60,055 in 2015.

Economic Contribution of Alaska's Wood Products Manufacturing to State 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). Measuring the economic contribution of Alaska's forest industry captures the direct economic activity associated with the industry as well as economic activity generated throughout the state economy by the existence of the forest products industry (Crandall et al. 2017). For this report, we assess the contribution of Alaska's forest industry as dollars spent on intermediate inputs, taxes, labor and, in turn, by households, generating economic opportunities as additional spending cycles through the state's economy.

Wood products manufacturers, workers engaged in forestry support activities, and forestry and logging workers collectively contribute 1,580 jobs and nearly \$111 million dollars in labor income directly to the state

³Support activities for forestry (NAICS 1153) encompasses a variety of activities, including wildfire suppression and prevention activities, tree thinning and planting, and pest management.

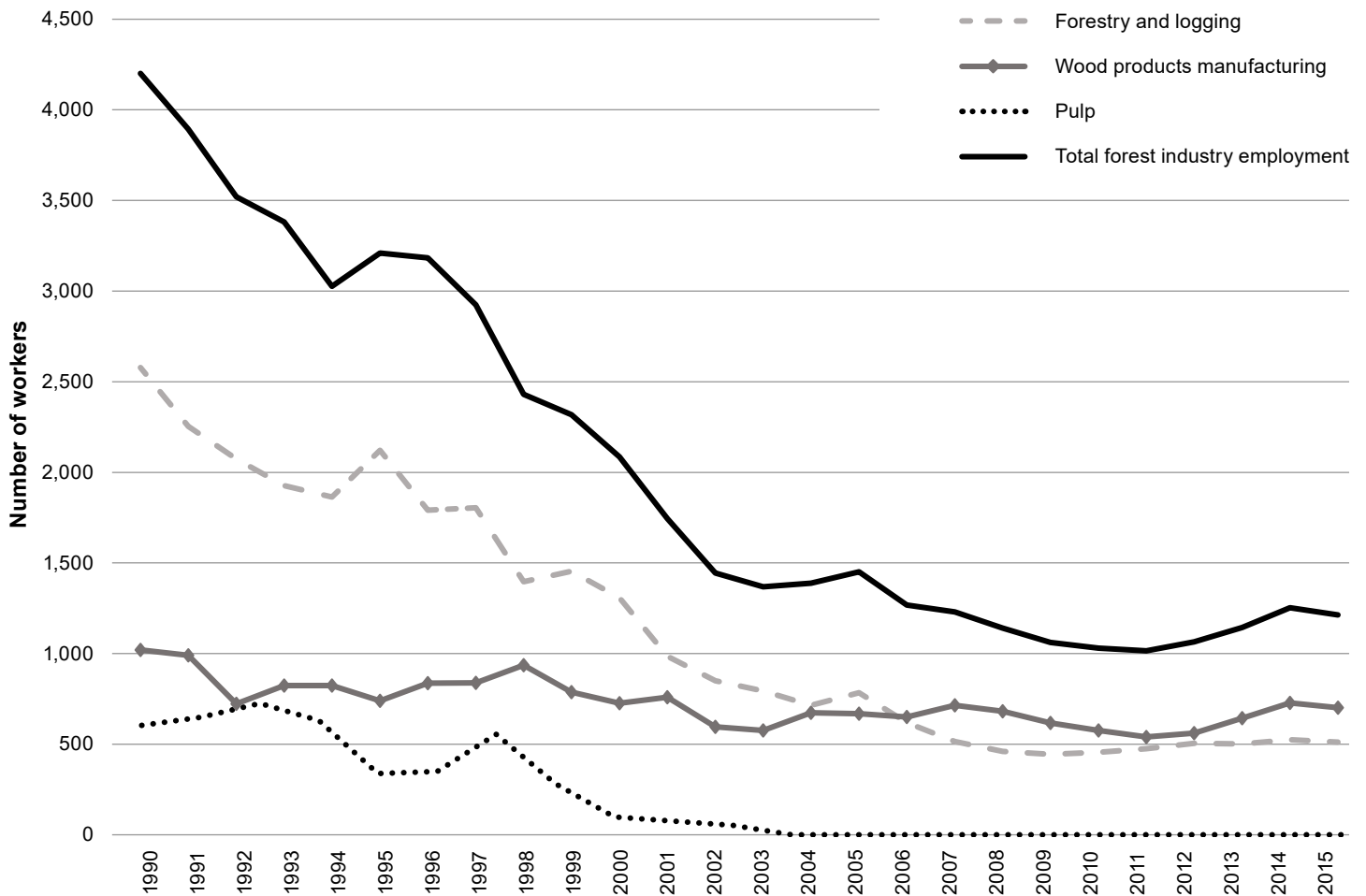


Figure 2—Employment in Alaska's forest industry, 1990 to 2015 (BBER 2016, USDC BEA 2016a).

economy. The activity associated with this direct employment generates additional economic opportunities by relying upon other industries for raw and intermediate inputs and services, thus indirectly bolstering employment and wages in various sectors. Using regional data and existing linkages within Alaska's economy represented by BEA RIMS II multipliers⁴ (USDC BEA 2014), BBER estimates that the wood products manufacturing sector alone supports more than 1,500 full- and part-time jobs and an associated \$118 million dollars in labor income (table 3).

Thus, for every wood products manufacturing job in the state, another 1.2 jobs are supported in related sectors, while for every \$1 paid in labor income by wood products manufacturers, another \$1.81 is paid in supporting sectors, including forestry and logging, forestry support, trucking, wholesale trade, and management.

Additionally, BBER estimates that the 511 people employed in the forestry and logging sector support an additional 541 full- and part-time jobs along with \$43.5 million dollars in labor income in supporting sectors such as

⁴The BEA does not endorse any resulting estimates or conclusions about the contribution of any given sector on an area.

Table 3—Average annual employment and labor income contributions of Alaska's forest industry

Sector	Direct employment	Indirect and induced employment	Total employment contribution ^a	Direct labor income	Indirect and induced labor income	Total labor income contribution ^a
	----- Number of jobs -----		-----	----- Thousands of 2015 dollars -----		
Wood products manufacturing	702	851	1,553	\$42,159	\$76,316	\$118,475
Forestry and logging	511	541	1,052	\$63,756	\$43,526	\$107,282
Forestry support activities	367	69	436	\$5,528	\$1,871	\$7,399
Total forest industry	1,580	^a	^a	\$111,443	^a	^a

^aIndirect and induced employment and labor income should not be summed for multiple sectors because some employment and income shows up as both direct contributions to their sectors and indirect contributions to other sectors.

equipment sales and repair. It should be noted that we do not aggregate sectors and avoid providing estimates of the total employment and labor income contribution for the entire forest industry to avoid double counting, as some employment and labor income shows up as both direct contributions to their sectors as well as indirect contributions to other sectors. In other words, some or all of the direct employment and labor income in the forestry and logging sector would be included with the indirect and induced contributions from wood products manufacturing because these manufacturers rely upon forestry and logging business to supply their raw material inputs.

See also, “Part 1: Timber Harvest, Products, and Flow;” “Part 2: Industry Sectors, Capacity, and Outputs;” and “Part 4: Alaska Data Tables.”

Species List

Sitka spruce (*Picea sitchensis* (Bong.) Carrière)

Western hemlock (*Tsuga heterophylla* (Raf.) Sarg)

Western redcedar (*Thuja plicata* Donn ex D. Don)

Glossary

board foot or board feet—A unit of measure applied to lumber that is 1 foot by 1 foot by 1 inch (30.48 centimeters by 3.48 centimeters by 2.54 centimeters) (or its equivalent) and also associated with roundwood as to its potential yield of such products.

bone-dry unit (BDU)—The amount of wood residue that weighs 2,400 pounds (1,088 kilograms) at 0 percent moisture content. One BDU equals approximately 9.49 cubic yards or 96 cubic feet (2.7 cubic meters) of solid wood.

fuelwood—Refers to wood used in the production of industrial heat and steam and residential firewood as well as wood pellet production. Pellets can be produced from mill residues (e.g., sawdust and shavings) as well as chipped roundwood.

house log—Roundwood timber used to construct log homes. Products manufactured from house logs can be sawn, scribed by hand, notched or milled by lathe to meet customer construction needs. House log timber is often dead (by choice, because “green” logs usually require drying before they can be used for construction) and of lower value than sawlogs.

production capacity (owner reported)—Potential ability of a facility to produce output per shift or 240-day work year,

assuming one 8-hour shift per day, firm market demand for products, and sufficient supply of raw materials. For sawmills, expressed as thousand board feet (MBF) lumber tally per shift or per year. Production capacity included in University of Montana's Bureau of Business and Economic Research reports is directly reported by facility owners or managers as MBF lumber tally output per work year for sawmills and thousand lineal feet of house log output per work year for log home manufacturers.

residue—The wood-fiber or bark byproduct remaining after timber processing of primary products such as lumber, plywood, posts and poles, house logs, etc. Three types of residue are generally generated: (1) coarse (chips, edgings, slabs, trim, mis-cuts, and log ends), (2) fine (sawdust and planer shavings), and (3) bark.

sawlog—A log that meets minimum regional standards of diameter, length, and defect, intended for sawing.

Scribner—A diagram log rule originating in the 1800s that assumes 1-inch (2.54 centimeters) boards and 0.25-inch (0.64 centimeters) kerf, and is based on diameter at the small end of the log, disregards taper, and does not provide for overrun. Note: The Scribner rule underestimates lumber yield on small logs and long logs with taper.

tonewood—Roundwood specifically processed (typically from large-diameter timber) for the production of musical instruments.

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