



Alaska's Forest Products Industry and Timber Harvest, 2015

Part 1: Timber Harvest, Products, and Flow

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Introduction

This resource bulletin is part of a series of reports presenting findings from a University of Montana Bureau of Business and Economic Research (BBER) census of Alaska's primary forest products industry. Part 1 of this series presents information on the volume of timber harvested in Alaska during 2015 by product, ownership, species, and resource area. It also describes the flow of timber within the state, across state lines, and exports to countries outside the United States.

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 firms 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 facility data were estimated, 80 percent of the 2015 harvest volume was captured through direct census of manufacturers or published information. Unlike other western states (ODF 2015, WA-DNR 2015), no single state agency compiles and comprehensively reports statewide timber harvest statistics for Alaska. For this report, timber harvest estimates were based on several sources, including BBER mill census data collected from primary processors; U.S. Department of Agriculture (USDA), Forest Service cut and sold reports; Timber Supply and Demand (706a) reports to Congress under the Alaska National Interest Lands Conservation Act (ANILCA) (Alexander 2012); State of Alaska Division of Forestry personal correspondence; as well as trade and export data compiled from the U.S. International Trade Commission (USITC).

The BBER and 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 (FIDACS) 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 mills, 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 Timber Resource

Coastal Alaska contains approximately 6.2 million acres of timberland, varying in ownership and species composition from north to south (Miles, n.d.). Nearly 79 percent of Alaska's timberlands are publicly owned, with the majority represented by Forest Service

holdings. The Tongass National Forest includes 3.4 million acres of coastal timberland, while the Chugach National Forest encompasses approximately 0.4 million acres of timberland. Additional federal ownership designations account for approximately 77,000 acres of Alaska's timberland. Alaska's Division of Forestry manages approximately 951,000 acres of timberland (Miles, n.d.). Privately held timberland, including Alaska Native corporations recognized under the Alaska Native Claims Settlement Act (ANCSA), account for approximately 1.3 million acres of Alaska's inventoried timberland. Alaska has the second-lowest proportion of forest classified as timberland of all 50 states. Of this low proportion of timberlands, publicly held timberlands account for the majority of sawtimber volume (fig. 1) (Miles, n.d.).

Similarly, 77 percent—approximately 110,893 million board feet (MMBF) Scribner—of sawtimber volume is found on National Forest System (NFS) land (Christensen 2017).

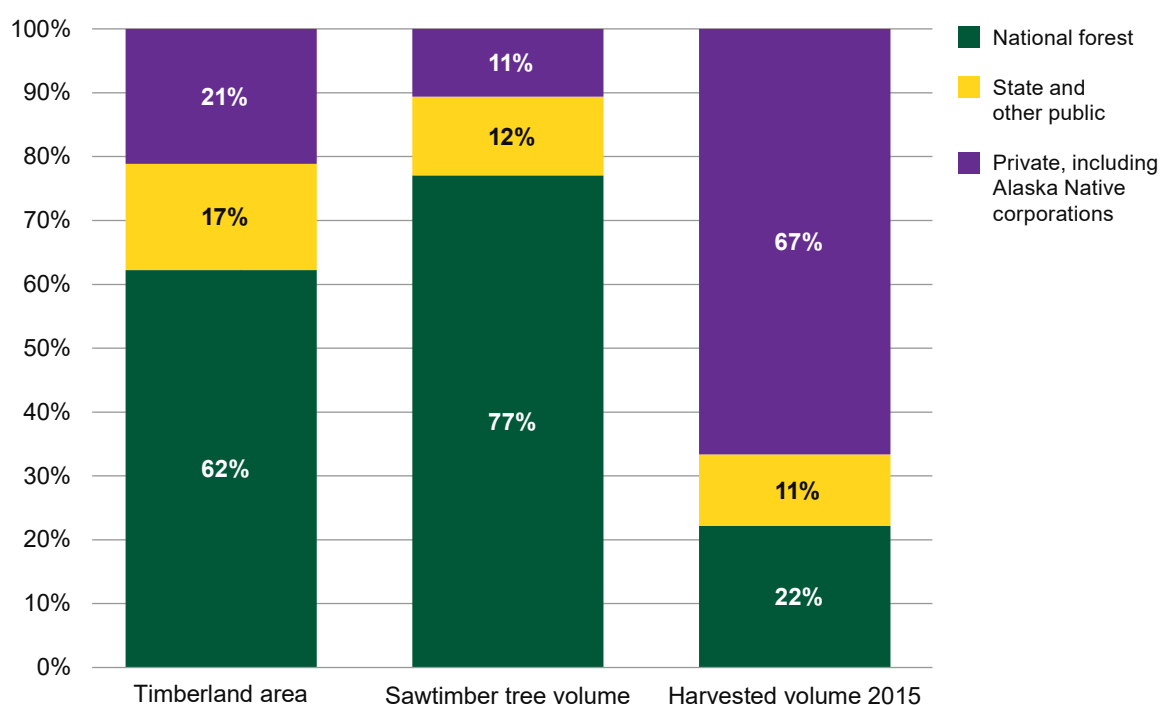


Figure 1—Characteristics of Alaska's timberland and timber harvest by ownership class, 2015 (BBER 2016, Miles, n.d.).

Sitka spruce (*Picea sitchensis* (Bong.) Carrière) accounts for roughly 25 percent (34,474 MMBF Scribner) of Alaska's sawtimber volume, while western hemlock (*Tsuga heterophylla* (Raf.) Sarg) represents the largest proportion of statewide sawtimber volume at 55 percent (79,305 MMBF Scribner) (Christensen 2017). National forests accounted for 22 percent of the total timber harvest in 2015, while private lands contributed the majority (67 percent) of timber harvest volume. Timberland information for this report is based on the FIA coastal Alaska permanent-plot-derived forest statistics. Historically, characterizing changes over time across the entire state of Alaska's timberlands has been challenging because there is no annualized permanent forest inventory for interior Alaska. However, during 2016, the FIA program initiated the systematic collection of plot measurements in the interior region to start addressing the challenges associated with previously missing forest inventory data.

Alaska's Timber Harvest

Timber harvest volume in 2015 was estimated at 136.4 MMBF Scribner, or approximately 25.3 million cubic feet (MMCF). Alaska's timber harvest volume has continued to decrease; it was 268.3 MMBF in 2005 (Halbrook et al. 2009) and 175.4 MMBF in 2011 (Berg et al. 2014). Within a decade, timber harvest volume in Alaska has decreased by nearly 50 percent (fig. 2). This decreasing trend has been observed across other western states in response to shifting forest policies as well as dynamic wood product markets. The Great Recession and subsequent drop in U.S. home construction between 2007 and 2009 reduced the demand for lumber and other wood products through 2010 and 2011 (Keegan et al. 2012). Though domestic home construction and

overseas demand have led to improvements across wood products markets, Alaska harvest levels continued to decrease between 2011 and 2015.

International log exports continue to be a large driver of harvesting activity in Alaska, representing more than 75 percent of the total timber harvest in 2015. This represents a decrease in the proportion of timber harvest exported relative to 2011 levels, when approximately 87 percent of the total timber harvested was exported. Private individuals and Alaska Native corporations are the predominant export entities in Alaska. However, as of 2007, the Limited Supply Shipping Policy of the USDA Forest Service allowed the regional forester to authorize the Tongass National Forest to export roundwood logs from public lands (Hines 1987, USDA FS 2017). Log exports across many other western states represent a small fraction of harvested volume, and most timber volume harvest across the West is processed at either in-state or neighboring state facilities (Berg et al. 2014; McIver et al. 2013, 2015; Simmons et al. 2016).

Harvest Ownership and Product Type

Although most of the timberland in Alaska is held under public ownership, privately held lands—including those managed by Alaska Native corporations—accounted for the majority of the timber harvested in 2015 (fig. 1). Private lands supplied 67 percent (90.8 MMBF Scribner) of Alaska's 2015 harvest volume (table 1); this represented both a decrease in volume harvested (128 MMBF) and overall proportion (73 percent) of total harvest from 2011 levels (Berg et al. 2014). Conversely, harvest across public ownerships represents an increasing proportion of the total harvest, with national forest timber harvest accounting for

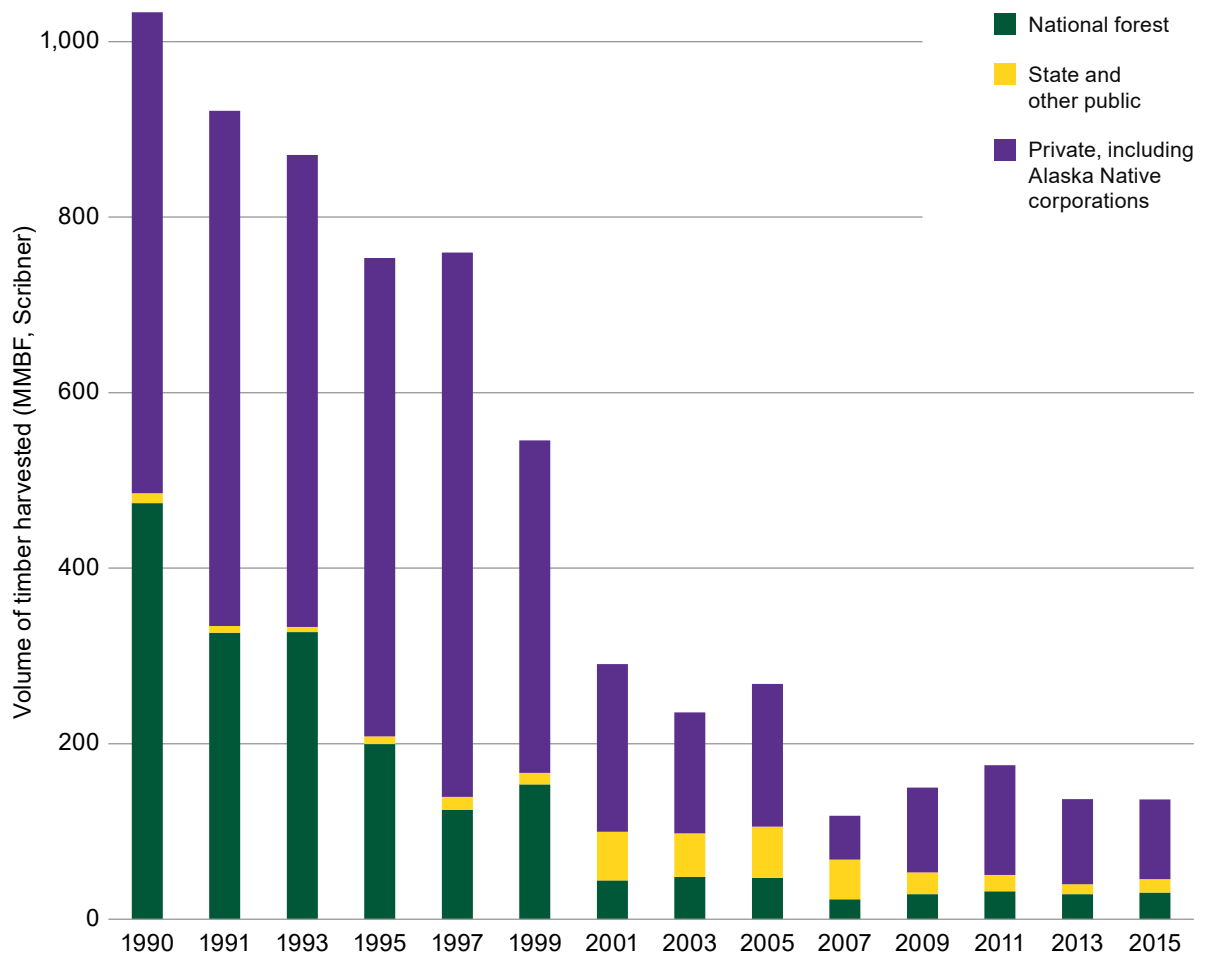


Figure 2—Alaska's timber harvest volume by ownership, selected years (Alexander 2012, BBER 2016, Berg et al. 2014, Brackley et al. 2009, USITC 2016, Zhou 2013, Zhou and Warren 2012).

approximately 30.3 MMBF (22 percent) of the volume in 2015, compared with approximately 28.7 MMBF (16 percent) in 2011.

Sawlogs, including export logs as well as logs used to produce lumber and other sawn products, have consistently been the predominant timber product harvested in Alaska. In 2015, sawlogs accounted for nearly 94 percent (127.8 MMBF) of the total timber harvest (table 1). Private lands provided most sawlogs (70 percent), while national forests supplied approximately 23 percent of sawlog volume.

Fuelwood used in the production of industrial heat, residential firewood, as well as wood pellet production, was the second-largest product type harvested in 2015. Fuelwood's

proportion of Alaska's timber harvest nearly doubled between 2011 and 2015, accounting for about 4 percent (5.7 MMBF) of the 2015 harvest. State and other public lands provided nearly all the fuelwood volume. House logs accounted for almost 1 percent of the harvest volume in 2015, similar to the proportion in 2011. Most of the house log volume came from state land (64 percent), followed by private lands (21 percent), and national forests (15 percent). Timber harvest volume used for other products exceeded house log harvest volume by more than 250 thousand board feet (MBF) in 2015, a notable increase from 2011. Predominantly sourced from national forests, other timber products include cedar

Table 1—Alaska timber harvest by ownership class and product type, 2015

Ownership class	Sawlogs	House logs	Fuelwood	Other products ^a	All products	2011 All products ^b
----- Thousand board feet Scribner -----						
Private, including Alaska Native corporations	89,244	281	823	501	90,848	127,990
National forest	28,961	194	60	1,071	30,286	28,688
State and other public	9,556	846	4,835	—	15,237	18,590
All owners	127,761	1,321	5,718	1,572	136,371	175,267

Note: Totals may not sum because of rounding, — = 0.

^aOther timber products include tonewood and cedar products.

^bBerg et al. (2014)

Table 2—Alaska timber harvest by species and product type, 2015

Species	Sawlogs	Other products ^{a,b}	All products
----- Thousand board feet Scribner -----			
Sitka spruce	96,115	279	96,393
Western hemlock	14,594	117	14,711
Western redcedar	12,188	1,294	13,483
White spruce	2,530	5,196	7,726
Birch species	734	1,280	2,014
Alaska yellow-cedar	1,425	247	1,671
Other ^c	174	198	373
All species	127,761	8,610	136,371

Note: Totals may not sum because of rounding.

^aOther products include house logs, fuelwood logs, cedar product logs, and tonewood.

^bProducts by species were combined to prevent disclosure.

^cOther species include cottonwood, quaking aspen, black spruce, poplar, and red alder.

products (shakes, shingles, and fencing) as well as tonewood used to craft musical instruments. While the combined category of these other wood products only accounted for 1 percent of the total harvest in 2015, the volume increased fourfold from 2011.

Harvest by Species

At more than 96 MMBF Scribner, Sitka spruce was the leading species harvested in Alaska in 2015 (table 2). Sitka spruce was also Alaska's predominant international export species. Historically, Alaska's timber harvest has been led by Sitka spruce, accounting for 47 percent (126.8 MMBF) of the total harvest volume in 2005 (Halbrook et al. 2009), 64 percent

(111 MMBF) in 2011 (Berg et al. 2014), and increasing to 70 percent in 2015. Western hemlock and western redcedar (*Thuja plicata* Donn ex D. Don) each accounted for roughly 10 percent of the overall harvest in 2015. Western hemlock, as a proportion of total harvest, has continued to decline from 28 percent (77.5 MMBF) in 2005, to 20 percent (35 MMBF) in 2011, and a notable decrease to nearly 11 percent (14.6 MMBF) in 2015. Though the proportion of the overall harvest represented by western hemlock has fallen over the past decade, it still comprises most of the growing stock volume on timberland in southeast Alaska (Miles, n.d.). White spruce (*Picea glauca* (Moench) Voss)

and a mix of birch species (*Betula neoalaskana* Sarg. and *Betula papyrifera* Marsh.) both experienced increases in volume harvested from 2011 to 2015, with most of their harvest occurring across interior Alaska.

Harvest by Geographic Source and Timber Flow

The geographic sources of Alaska's timber harvest have been divided into five resource areas (fig. 3). Interior Alaska was the only resource area to experience an increase in harvest volume between 2011 and 2015. Harvest volume in interior Alaska increased by about 1.4 MMBF, accounting for approximately 6 percent (7.9 MMBF) of the total timber harvest in 2015. While combined harvest volume in southcentral and western Alaska fell to 52.5 MMBF, the proportional contribution of timber harvest from these areas increased slightly in 2015. The southcentral and western regions of Alaska were combined in this report and in related

data tables to avoid disclosure of individual mill information. Harvest volume from southeast Alaska experienced the most dramatic shift, decreasing by 25 percent between 2011 and 2015 and accounting for 76 MMBF in 2015. Southeast boroughs and census areas contributed nearly 60 percent of all the sawlog volume harvested in 2015, compared with the more than 80 percent of sawlog harvest volume in 2011. Interior Alaska accounted for 84 percent of the fuelwood products harvested in 2015. Most of the harvest for house log and log home products originated in southcentral and western Alaska (48 percent) followed by interior Alaska (39 percent).

Overall, timber harvest in 2015 shifted away from southeast Alaska toward the southcentral, western, and interior resource areas. However, southeast Alaska still accounts for approximately 56 percent of the timber harvest volume and contains the majority of the state's manufacturing infrastructure and capacity.

Approximately 105 MMBF (77 percent) of the 2015 Alaska timber harvest were international log exports, and 23 percent of statewide harvest was received by Alaska processing facilities. Alaska facilities did not report sending logs to out-of-state facilities for additional processing, nor did they report receiving timber from any other states or countries.

Most of Alaska's sawmills and timber-processing capacity are in southeast Alaska. Across all of Alaska's geographic resource areas, nearly 100 percent of the timber harvested (excluding volume intended for export) in each region was also processed in the same resource area, indicating limited timber flow between resource areas within Alaska. The small exception was the approximately 3 percent of harvest from southcentral Alaska which flowed to southeast Alaska for processing.



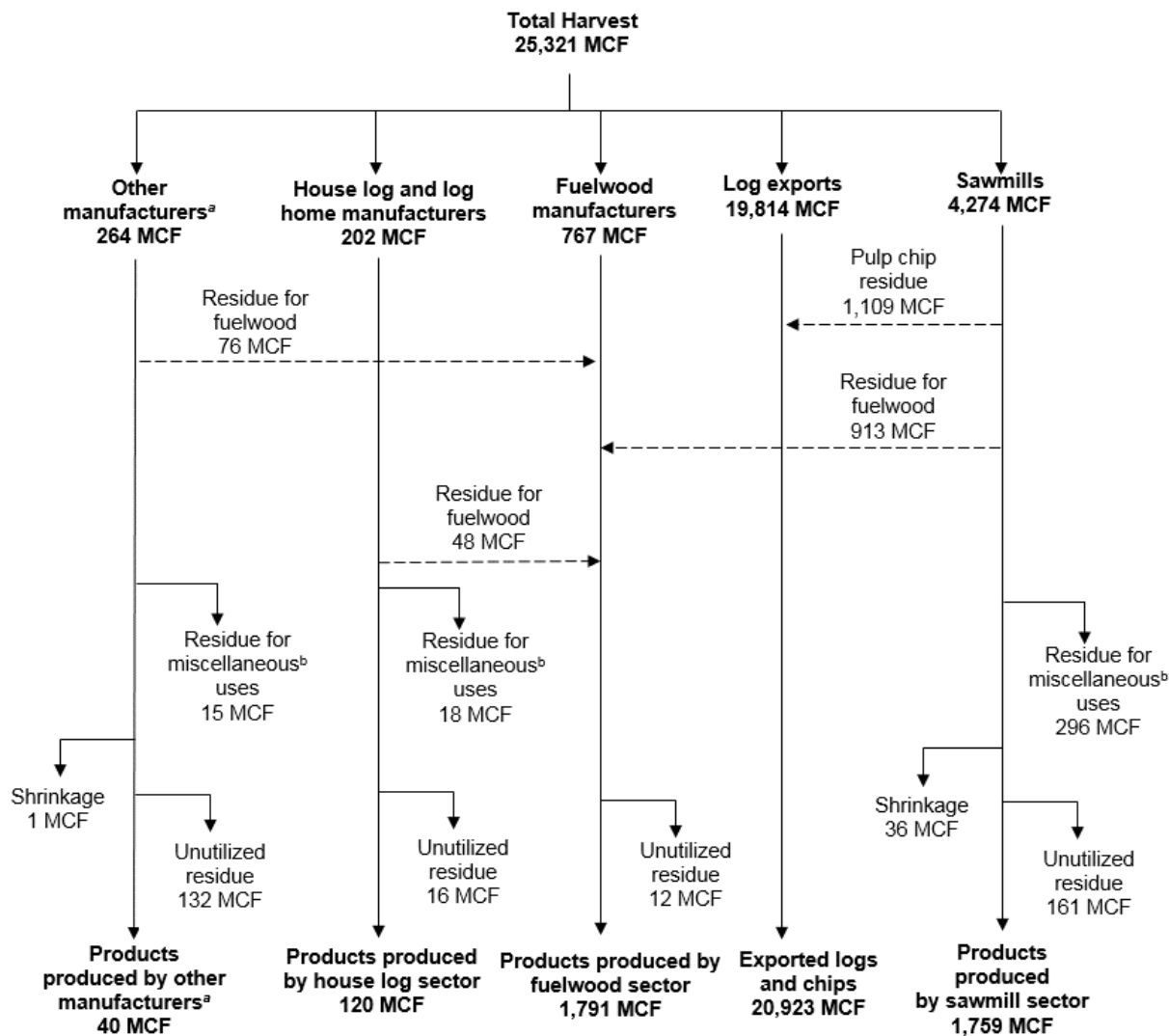
Figure 3—Alaska's geographic resource areas.

Utilization of Alaska's Timber Harvest

Alaska's 2015 timber harvest was approximately 25.3 MMCF, excluding bark (fig. 4). This total harvest volume flowed to a variety of in-state timber processing facilities and to other countries as log exports. The majority, 78 percent (19.8 MMCF) was exported as logs, 17 percent (4.3 MMCF) went to sawmills, 3 percent (767 thousand cubic feet [MCF]) went to fuelwood manufacturers, 1 percent (264 MCF) went to producers of

tonewood and cedar products, while the remaining 1 percent (202 MCF) went to house log and log home manufacturers.

Of the volume received and processed by Alaska facilities (5.5 MMCF), approximately 19 percent (1 MMCF) became residue used for fuelwood, while 6 percent (329 MCF) became residue for a suite of miscellaneous uses, including landscape mulch and animal bedding. Of the nearly 4.3 MMCF of volume received by sawmills, more than 41 percent (1.8 MMCF) became finished lumber or other



^a Other manufacturers include manufacturers of tonewood and cedar products.

^b Miscellaneous uses include landscape mulch and animal bedding.

Figure 4—Alaska's 2015 timber harvest by product type and final disposition.

sawn products. Approximately 321 MCF of wood fiber was unused. Log export sort yards are also a source of residue (TSS Consultants 2000); however, BBER was unable to obtain recent and accurate data on sort yard residue and biomass volumes.

See also, “Part 2: Industry Sectors, Capacity, and Outputs;” “Part 3: Sales, Employment, and Contributions to the Statewide Economy;” and “Part 4: Alaska Data Tables.”

Metric Equivalents

When you know:	Multiply by:	To find:
Acres	0.405	Hectares
Cubic feet	0.0283	Cubic meters

Species List

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

Western hemlock

(*Tsuga heterophylla* (Raf.) Sarg)

Western redcedar

(*Thuja plicata* Donn ex D. Don)

White spruce (*Picea glauca* (Moench) Voss)

Alaska paper birch (*Betula neoalaskana* Sarg.)

Paper birch (*Betula papyrifera* Marsh.)

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.

board foot to cubic foot ratio (BFCF)—

The University of Montana’s Bureau of Business and Economic Research developed conversion factors for each timber processing sector (by state) to convert Scribner board foot volume to cubic foot using the methods outlined in Keegan et al. (2010). Ratios have changed through time

as a result of changes in product recovery, residue production, and shifts in log diameter size utilized.

cubic foot or cubic feet—A unit of true volume that measures 1 foot by 1 foot by 1 foot (30.48 centimeters by 30.48 centimeters by 30.48 centimeters).

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 or 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.

timber-processing capacity—The volume of timber reported in thousand board feet (MBF) Scribner that could be processed given sufficient supplies of raw materials and firm market demand for products. Timber-processing capacity is estimated for each facility by applying the product recovery ratios to production capacity. This essentially gauges the volume of timber facilities could use if they operated at their self-reported production capacity, and is expressed as MBF Scribner log scale of timber per shift or per work year. University of Montana's Bureau of Business and Economic Research computes a facility's timber-processing capacity by dividing its production capacity by its product recovery ratio. Timber-processing capacity is generally expressed in MBF Scribner log scale, regardless of wood products manufacturing sector, and is therefore useful in characterizing the timber consumption potential of an entire state's forest products industry.

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

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