Alaska's Forest Products Industry and Timber Harvest, 2015

The University of Montana's Bureau of Business and Economic Research (BBER), in conjunction with the Pacific Northwest Forest Inventory and Analysis (PNW-FIA) Program of the US Forest Service, conducted a census of Alaska's timber processors operating during calendar year 2015. Through a written questionnaire, phone, or in-person interview, timber-processing and residue-utilizing facilities provided information about their 2015 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

Facility-level information was compiled, coded, analyzed and summarized. Because this study is based on a census, rather than statistical sample of firms, there is no statistical error associated with the estimates presented. Possibilities of reporting and measurement error exist, but are minimized by checking each facility's data for internal consistency and cross-checking summarized data against other public and private information. 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 to garner high-level reviews.

Some firms choose not to participate or do not provide complete data. Data for facilities that did not respond were estimated using previous years' surveys, data from similar facilities, and other information. For the 2015 Alaska census, data were received for 51 of the 60 active, in-state facilities. While some of the collected facility data required estimation methods to finalize, 80 percent of the harvest volume in 2015 was captured through quantitative methods. The resulting facility-level information was then compiled and summarized as presented here. A glossary is also included to provide additional context and clarity for terminology used in the data tables and subsequent reporting.

In addition to data collected through BBER survey efforts, publicly available data sources were leveraged to help reconcile and estimate total harvest volumes. USDA Forest Service Cut and Sold Reports provided context for national forest harvest levels. USDA Forest Service 2015 export permits as well as United States International Trade Commission (USITC) export data provided information on export volume, species, value, ownership and destination in 2015. Additional harvest and export information from lands under state ownership were received through personal correspondence with the State of Alaska Division of Forestry.

A series of research briefs/bulletins are currently being prepared that will include selected tables along with historical information and current industry trends. All BBER reports on Alaska's forest products industry can be found at: http://www.bber.umt.edu/FIR/S_AK.asp

As we continue to finalize the reports, we would like to provide this "core" information to our data users and other interested individuals. We encourage you to contact us if you have any additional questions about the data. However, firm-level data are confidential and will not be released.

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Highlights

- Alaska's statewide timber harvest in 2015 was estimated at 136.4 million board feet (MMBF) Scribner, down from 175.3 MMBF in 2011. Private lands supplied the majority of the harvest at 67 percent, a decrease from nearly 73 percent in 2011. Conversely, public ownerships have increased as a proportion of the harvest, with USFS timber harvest accounting for about 22 percent in 2015, compared with little more than 16 percent in 2011.
- Sitka spruce was the leading species harvested, accounting for 70 percent of the total harvest volume, and was also the major export species in 2015. Western hemlock and western redcedar each accounted for roughly 10 percent of the overall harvest. Sawlogs were the main product harvested, accounting for nearly 94 percent of the total harvest, and Southeast boroughs/census areas contributed nearly 60 percent of this volume. By comparison, Southeast boroughs accounted for more than 80 percent of the sawlog volume harvested in 2011.
- Though timber products including tonewood (wood used to make musical instruments) and cedar products combined only accounted for 1 percent of the total harvest in 2015, this represented a substantial increase (nearly four times) over the volume in 2011.
- Alaska log exports decreased dramatically between 2011 and 2015, falling approximately 42 percent. Alaskan log exports reached a decadal high (2005 to 2015) in 2012, but began decreasing in 2013 – falling by 28 percent in 2014, and by an additional 20 percent in 2015.
- Nearly all 2015 Alaskan log exports were sent to Pacific Rim countries in Northeast Asia, with China receiving approximately 76 percent of the volume leaving the Anchorage Customs District. Japan accounted for 16 percent and Korea an additional 7 percent of the exported log volume. Exports to all three of these countries have decreased between 2011 and 2015 by an average of more than 50 percent.
- A total of 60 Alaska primary wood products facilities were identified as active in 2015:
    - 39 sawmills
    - 11 log home manufacturers
    - 10 other primary facilities that produced other products including fuelwood/energy products, cedar products and tonewood.
- Although the number of active Alaska facilities decreased from 2011, 6 new facilities were identified and one sawmill became active again in 2015. Approximately 14 facilities active in 2011 were idle and not operating during 2015, while 10 active 2011 facilities have since closed.

- State and other public lands provided about 9 percent (2.8 MMBF Scribner) of the timber processed by Alaska facilities in 2015. About 37 percent (11.6 MMBF) of utilized volume came from private and native corporation lands. National forest lands accounted for 54 percent (16.9 MMBF) of timber received by Alaska facilities.
- Western redcedar was the most common species received by Alaska facilities, accounting for 35 percent of all products – an increase of nearly 10 percent over 2011—and accounting for approximately 42 percent of the sawlog volume. Western hemlock only accounted for 5 percent of timber volume received by facilities in 2015, a level less than half of what it was in 2011.
- Despite declining harvest levels and lower mill receipt volumes, Alaska's 39 sawmills produced just over 30 MMBF of lumber, nearly 50 percent more than in 2011. Alaska sawmills recovered an average of 1.33 board feet lumber tally per board foot Scribner of log input, a 12-percent increase over 2011. This increase in overrun likely reflects improved market conditions. State-wide house log production fell by more than 15 percent from 2011 to 2015, while fuelwood products (firewood and wood pellets) increased by 12 percent.
- Self-reported production capacity fell statewide alongside the reduction in active Alaskan primary processing facilities. Lumber production capacity fell by 9 percent from 2011 to 2015 while house log production capacity fell by 52 percent. Interior Alaska saw the most dramatic drop in house log production capacity, falling by 77 percent since 2011. Annual timber-processing capacity of active facilities in the combined sawmill and houselog sectors fell by 8.5 percent since 2011, to 121.4 MMBF Scribner. Although overall production capacity fell, capacity utilization in Alaska's sawmill and house log sectors increased to over 20 percent in 2015, close to the 2005 utilization levels.
- Total residue volume produced in 2015 increased over reported 2011 volumes, alongside increasing lumber production. A general increase in facilities reporting "other uses" of residues – animal bedding, mulch, landscape material – was observed in 2015. The proportion of residue used for fuelwood dropped slightly between 2011 and 2015, likely linked to the impact of lower natural gas prices, and facilities have found alternative uses for mill residuals.
- Alaska's primary forest products industry shipped products valued at $23.3 million (free on board [f.o.b.] the producing mill) in 2015, an increase of 28 percent from 2011, in constant 2015 dollars. The majority of primary products were sold within the state of Alaska. Residue sales – including firewood, garden mulch, animal bedding and landscaping fill – also increased to nearly $4.9 million in 2015. Due to dramatic decreases in sawlog volume exported from Alaska, statewide total sales value for the forest products industry in 2015 was down nearly 20 percent from 2011 estimates.

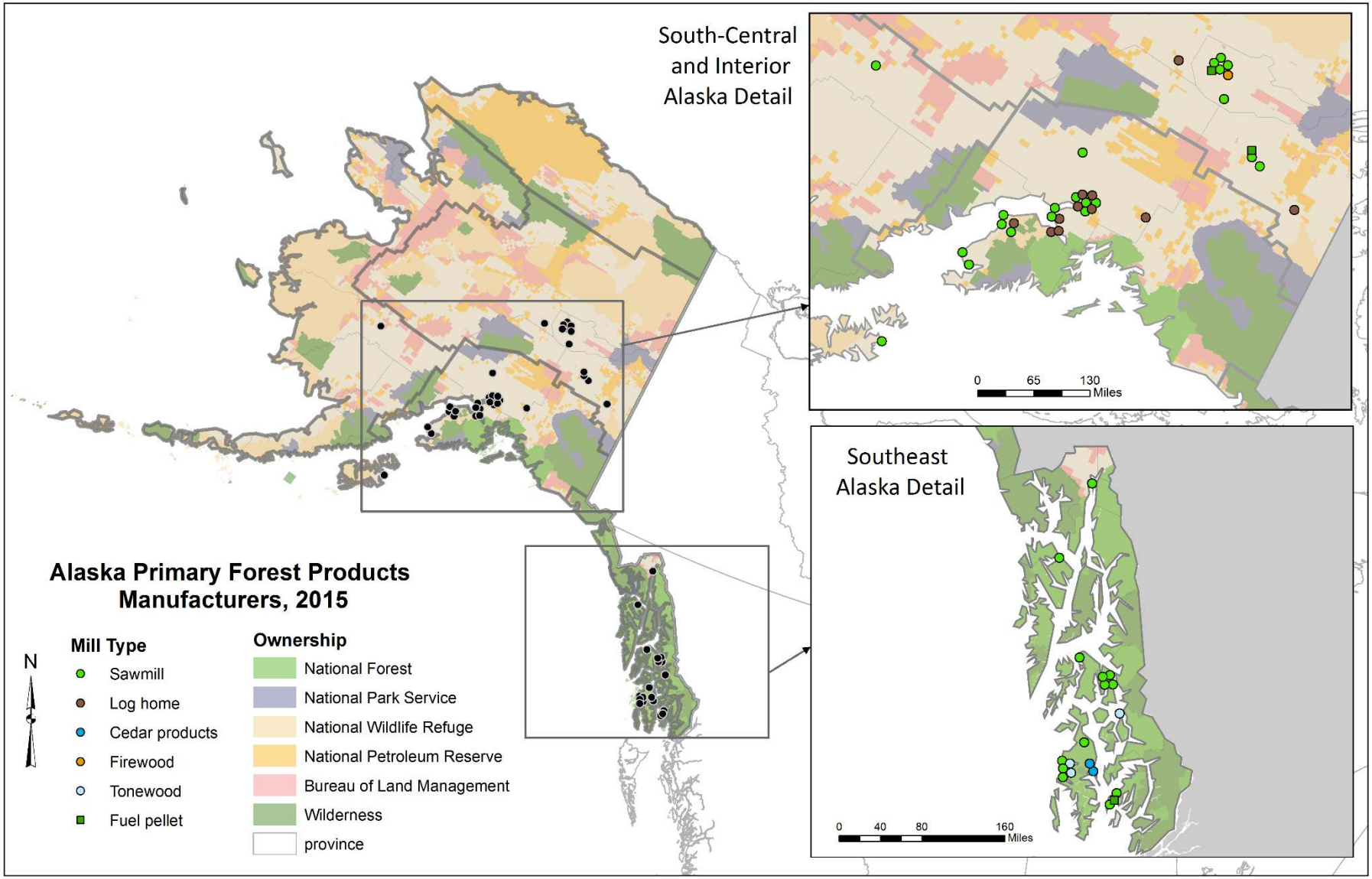

Figure 1 –Alaska's primary wood processing facilities active during calendar year 2015.

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
			Thousand board feet, Scribner			
Private -- including 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**
			Percent of harvest			
Private -- including Native corporations	69.9	21.2	14.4	31.9	66.6	73.0
National Forest	22.7	14.7	1.0	68.1	22.2	16.4
State and other public	7.5	64.1	84.6	--	11.2	10.6
All owners[b]	**93.7**	**1.0**	**4.2**	**1.2**	**100**	**100**

[a] Other timber products include tonewood and cedar products.

[b] Total may not add to 100% due to rounding.

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

Species	Sawlogs	Other products[ab]	All products	2011 All products
	Thousand board feet, Scribner			
Sitka spruce	96,115	279	96,393	111,364
Western hemlock	14,594	117	14,711	35,159
Western redcedar	12,188	1,294	13,483	18,362
White Spruce	2,530	5,196	7,726	6,173
Birch species	734	1,280	2,014	1,660
Alaska-yellow cedar	1,425	247	1,671	1,786
Other[c]	174	198	373	762
All species	**127,761**	**8,610**	**136,371**	**175,267**
	Percent of harvest			
Sitka spruce	75.2	3.2	70.7	63.5
Western hemlock	11.4	1.4	10.8	20.1
Western redcedar	9.5	15.0	9.9	10.5
White Spruce	2.0	60.3	5.7	3.5
Birch species	0.6	14.9	1.5	0.9
Alaska-yellow cedar	1.1	2.9	1.2	1.0
Other[c]	0.1	2.3	0.3	0.4
All species[d]	**93.7**	**6.3**	**100**	100.0

[a] Other products include houselogs, fuelwood logs, cedar product logs, and tonewood.

[b] Products by species were combined to prevent disclosure.

[c] Other species include cottonwood, quaking aspen, black spruce, poplar and red alder.

[d] Total may not add to 100% due to rounding.

Table 3—Alaska timber harvest by resource area, 2015

Resource area	Harvest Volume	Percentage of total
	Thousand board feet, Scribner	
Interior	7,863	5.8
Southcentral & Western[a]	52,547	38.5
Southeast	75,961	55.7
State total	**136,371**	**100**

[a] Resource areas combined to avoid disclosure.

Table 3 - *reference for resource area*

Alaska timber resource and borough/census areas
Resource area
Interior:
Fairbanks North Star Borough
Denali Borough
Yukon-Koyukuk
Southeast Fairbanks Census Area
Southcentral:
Anchorage Borough
Kenai Peninsula Borough
Matanuska-Susitna Borough
Valdez-Cordova Census Area
Southeast:
Haines Borough
Juneau Borough
Ketchikan Gateway Borough
Prince of Wales-Outer Ketchikan Census Area
Sitka Borough
Skagway-Hoonah-Angoon Census Area
Wrangell-Petersburg Census Area
Yakutat Borough
Western:
Bethel Census Area
Kodiak Island Borough

Table 4—Timber volume received by Alaska facilities by ownership class and product type, 2015

Ownership class	Sawlogs[a]	House logs	Fuelwood[b]	Other products[c]	2015 -- all products	2011 -- all products[d]	2005 -- all products[e]
	Thousand board feet, Scribner						
Private -- including native corporation	1,244	281	823	501	2,848	3,364	3,743
National Forest	15,545	194	60	1,071	16,870	12,099	23,866
State & other public	5,880	846	4,835	--	11,561	7,796	17,252
All owners	**22,669**	**1,321**	**5,718**	**1,572**	**31,280**	**23,259**	**44,861**
	Percentage of volume received						
Private -- including native corporation	5.5	21.2	14.4	31.9	9.1	14.5	8.3
National Forest	68.6	14.7	1.0	68.1	53.9	52.0	53.2
State & other public	25.9	64.1	84.6	--	37.0	33.5	38.5
All owners[f]	**72.5**	**4.2**	**18.3**	**5.0**	**100**	**100**	**100**

[a] Timber exports not included.

[b] Includes timber used for residential firewood, industrial fuelwood for pellet manufacturing and chips for park/playground fill.

[c] Includes cedar product and tonewood logs.

[d] From Berg et al. (2014).

[e] From Halbrook et al. (2009).

[f] Total may not add to 100% due to rounding.

Table 5—Timber volume received by Alaska facilities by species and product type, 2015

Species	Sawlogs[a]	House logs	Fuelwood[b]	Other products[c]	2015 -- all products	2011 -- all products[d]	2005 -- all products[e]
	Thousand board feet, Scribner						
Western redcedar	9,597	28	12	1255	10,891	5,671	1,857
White spruce	2,530	942	4,254	--	7,726	6,174	6,154
Sitka spruce	7,443	180	28	71	7,722	5,114	10,877
Birch species	734	48	1,232	0	2,014	1,660	230
Western hemlock	1,579	44	23	50	1,696	3,114	23,539
Alaska yellow-cedar	612	57	7	183	858	373	1,099
Other[f]	174	22	162	15	373	1,153	1,105
All species	**22,669**	**1,321**	**5,718**	**1,572**	**31,280**	**23,259**	**44,861**
	Percent of volume received						
Western redcedar	42.3	2.1	0.2	79.8	34.8	24.4	4.1
White spruce	11.2	71.3	74.4	--	24.7	26.5	13.7
Sitka spruce	32.8	13.6	0.5	4.5	24.7	22.0	24.2
Birch species	3.2	3.6	21.5	0.0	6.4	7.1	0.5
Western hemlock	7.0	3.3	0.4	3.2	5.4	13.4	52.5
Alaska yellow-cedar	2.7	4.3	0.1	11.6	2.7	1.6	2.4
Other[f]	0.8	1.6	2.8	0.9	1.2	5.0	2.5
All species[g]	**72.5**	**4.2**	**18.3**	**5.0**	**100**	**100**	**100**

[a] Timber exports not included.

[b] Includes timber used for residential firewood, industrial fuelwood for pellet manufacturing and chips for park/playground fill.

[c] Includes cedar products and tonewood logs.

[d] From Berg et al. (2014).

[e] From Halbrook et al. (2009).

[f] Species combined to avoid disclosure. Other species include cottonwoods, Balsam poplar, quaking aspen, red alder, and black spruce.

[g] Total may not add to 100% due to rounding.

Table 6—Timber volume received by Alaska facilities by resource area and product type, 2015

Resource Area	Sawlogs[a]	House logs	Fuelwood[b]	Other products[c]	2015 -- all products	2011 -- all products[d]	2005 -- all products[e]
	Thousand board feet, Scribner						
Southeast	19,071	166	60	1,572	20,869	13,812	37,982
Southcentral & Western[f]	1,061	634	853	0	2,547	3,022	2,900
Interior	2,538	520	4,805	0	7,863	6,425	3,729
All areas	**22,669**	**1,321**	**5,718**	**1,572**	**31,280**	**23,259**	**44,861**[g]
	Percent of volume received						
Southeast	84.1	12.6	1.0	100.0	66.7	59.4	84.7
Southcentral & Western[f]	4.7	48.0	14.9	0.0	8.1	13.0	6.5
Interior	11.2	39.4	84.0	0.0	25.1	27.6	8.3
All areas[h]	**72.5**	**4.2**	**18.3**	**5.0**	**100.0**	**100.0**	**100.0**

[a] Timber exports not included.

[b] Includes timber used for residential firew ood, industrial fuelw ood for pellet manufacturing and chips for park/playground fill.

[c] Includes cedar products and tonew ood logs.

[d] From Berg et al. (2014).

[e] From Halbrook et al. (2009).

[f] Resource areas combined to avoid disclosure.

[g] Includes 250 MBF from outside the state of Alaska (Halbrook et al. 2009).

[h] Total may not add to 100% due to rounding.

Table 7—Alaska lumber, house log, fuelwood, and other product production by resource area, 2015

Resource area	Lumber and other sawn products[a]	House logs	Fuelwood Products[b]	Other Products[c]
	Thousand board feet, lumber tally	*Thousand lineal feet*	*Bone-dry units[d]*	*Thousand board feet, lumber tally*
Southeast	25,122	68	724	1,604
Southcentral & Western[e]	1,315	137	1,854	--
Interior	4,752	113	12,390	--
All areas	**31,189**	**318**	**14,969**	**1,604**

[a] Includes all sawn products, regardless of facility type.

[b] Includes firewood, wood pellets, and wood chips for recreational uses.

[c] Includes cedar products and tonewood.

[d] Bone-dry unit (BDU) = 2,400 pounds of oven dry wood.

[e] Resource areas combined to avoid disclosure.

Table 8—Number of active timber-processing facilities by borough/census area and product produced, 2015[a]

Borough/census area	Lumber	House logs	Other[b]	Total
Anchorage Borough	1	3	--	4
Bethel Census Area	1	--	--	1
Fairbanks North Star Borough	5	--	2	7
Haines Borough	2	--	--	2
Juneau Borough	--	--	--	--
Kenai Peninsula Borough	5	2	--	7
Ketchikan Gateway Borough	2	--	--	2
Kodiak Island Borough	1	--	--	1
Matanuska-Susitna Borough	6	4	--	10
Prince of Wales-Outer Ketchikan Census Area	7	--	6	13
Skagway-Hoonah-Angoon Census Area	2	--	--	2
Southeast Fairbanks Census Area	2	1	1	4
Wrangell-Petersburg Census Area	5	--	1	6
Yukon-Koyukuk	--	1	--	1
2015 State total	**39**	**11**	**10**	**60**
2011 State total[c]	50	18	9	77
2005 State total[d]	50	20	8	78

[a] Does not include timber exporters.

[b] Other facilities include producers of fuelwood, wood pellets, cedar products, and tonewood.

[c] From Berg et al. (2014).

[d] From Halbrook et al. (2009).

Table 9—Alaska annual lumber production and average overrun by sawmill size, 2015

Annual lumber production size class	Number of sawmills	2015 lumber production[a]	Percentage of total	Average overrun
		MBF[b]		
< 150 MBF lumber tally	31	1,516	5	1.04
150 to 500 MBF lumber tally	3	1,013	3	1.17
> 500 MBF lumber tally	5	28,190	92	1.36
2015 State Total	**39**	**30,719**	**100**	**1.33**
2011 State Total[c]	50	20,558		1.19
2005 State Total[d]	50	54,861		1.27

[a] Includes only sawn products from saw mills, does not include sawn products from the house log sector.

[b] Thousand board feet, lumber tally.

[c] From Berg et al. (2014).

[d] From Halbrook et al. (2009).

Table 10—Alaska production capacity[a] by resource area and sector, 2015

Resource area[b]	Lumber production capacity	House log production capacity
	MBF, lumber tally	*Thousand lineal feet*
Southeast	98,255	210
Southcentral & Western[c]	6,787	417
Interior	19,298	200
2015- all resource areas	**124,340**	**827**
2011- all resource areas[d]	137,331	1,740
2005- all resource areas[e]	240,159	2,603

[a] Includes only facilities active during 2015.

[b] See Table 3 for a list of borough/census areas located within resource areas.

[c] Resource areas combined to avoid disclosure.

[d] From Berg et al. (2014).

[e] From Halbrook et al. (2009).

Table 11—Alaska annual timber-processing capacity[a] and use by size class and sector, 2015

Annual timber-processing capacity size class	Number of active facilities	Annual timber processing capacity		2015 Timber use	
		Timber-processing capacity	Sector capacity	Volume processed	Capacity utilization within size class
MBF[b]		*MBF[b]*	*Percent*	*MBF[b]*	*Percent*
Sawmill sector					
< 250 MBF	17	2,380	2.4	827	34.7
251-500 MBF	5	1,818	1.9	303	16.7
501-1000 MBF	7	5,886	6.0	1,127	19.1
>1000 MBF	10	87,602	89.7	20,780	23.7
Sawmill sector total	**39**	**97,686**	**100**	**23,037**	**23.6**
House log & other[c] sectors	**18**	**23,708**	**100**	**1,652**	**7.0**
2015 combined sector totals	**57**	**121,394**		**24,689**	**20.3**
2011 combined sector totals[d]	77	132,794		20,741	15.6
2005 combined sector totals[e]	77	202,156		46,131	21.4

[a] Includes facilities active during 2015 only. Does not include timber exporters.

[b] Thousand board feet, Scribner

[c] Other sectors include cedar products, tonewood and firewood (excluding pellet plants) manufacturers.

[d] From Berg et al. (2014).

[e] From Halbrook et al. (2009).

Table 12—Alaska sawmill[a] residue factors, 2015

Type of residue	BDU[b] per MBF lumber tally
Coarse	0.60
Sawdust	0.17
Planer shavings	0.09[c]
Bark	0.17
Total	**0.95**

[a] Includes saw mills producing only lumber and no other products.

[b] Bone-dry unit (BDU = 2,400 lb of oven-dry w ood) of residue generated for every 1,000 board feet of lumber manufactured.

[c] This factor represents only the few pristine Alaskan saw mills that planed lumber. The combined planer shavings factor w as <0.001 for all saw mills w hich only produced lumber, w hether or not the mills reported planer shavings.

Table 13—Production and disposition of mill residue from Alaska's forest products industry, 2015

	Residue disposition				
Type of residue	**Pulp chips**	**Fuelwood[a]**	**Other uses[b]**	**Unused**	**Total**
	Bone-dry units[c]				
Coarse[d]	13,886	4,851	1,067	1,453	21,256
Sawdust	550	4,393	656	490	6,089
Shavings/peelings	--	171	1,126	192	1,490
Bark	--	3,615	1,346	1,127	6,088
All residues	**14,436**	**13,029**	**4,196**	**3,262**	**34,923**

[a] Fuelw ood uses include fuel/firew ood for heating and w ood pellet production.

[b] Other uses primarily include animal bedding, mulch, and landscape material.

[c] Bone-dry unit (BDU) = 2,400 pounds of oven dry w ood.

[d] Coarse residue includes chips, edgings, slabs, cull sections of logs and log ends.

Table 14—Destination and sales value of Alaska's primary wood products and sawmill residue, free on board (f.o.b.) the producing facility in 2015

Product	Alaska	West Coast[a]	Other States	Pacific Rim	Canada	2015 Total
	Thousands of 2015 dollars					
Lumber	5,964	4,718	1,087	1,141	149	13,059
Other[b]	9,464	713	--	--	79	10,256
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

[a] West Coast states include California, Hawaii, Oregon, and Washington.

[b] Other products include house logs, firewood, wood pellets, cedar products and tonewood.

[c] Residue products include firewood, garden mulch, animal bedding and wood chips for park/playground fill and landscaping.

[d] United States Internationl Trade Commission (USITC) Dataweb tool.

[e] Data pooled across destinations to prevent disclosure of confidential information.

[f] From Berg et al. (2014).

[g] From Halbrook et al. (2009).

Figure 2 (below) traces the flow of wood fiber inputs and outputs in Alaska's primary timber industry by sector, demonstrating the utilization of Alaska's timber harvest in cubic feet for 2015. By converting all facility 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 wood fiber from different sectors 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 (BFCF), were developed from log size specifications, as well as product and residue recovery information, provided by processors of Alaska's 2015 timber harvest:

- 6.54 board feet per cubic foot for house logs
- 6.20 board feet per cubic foot for other products
- 5.30 board feet per cubic foot for sawlogs, including exports
- 3.06 for fuelwood products

These board-foot-to-cubic-foot (BFCF) ratios have changed through time as a result of changes in product recovery and residue production.

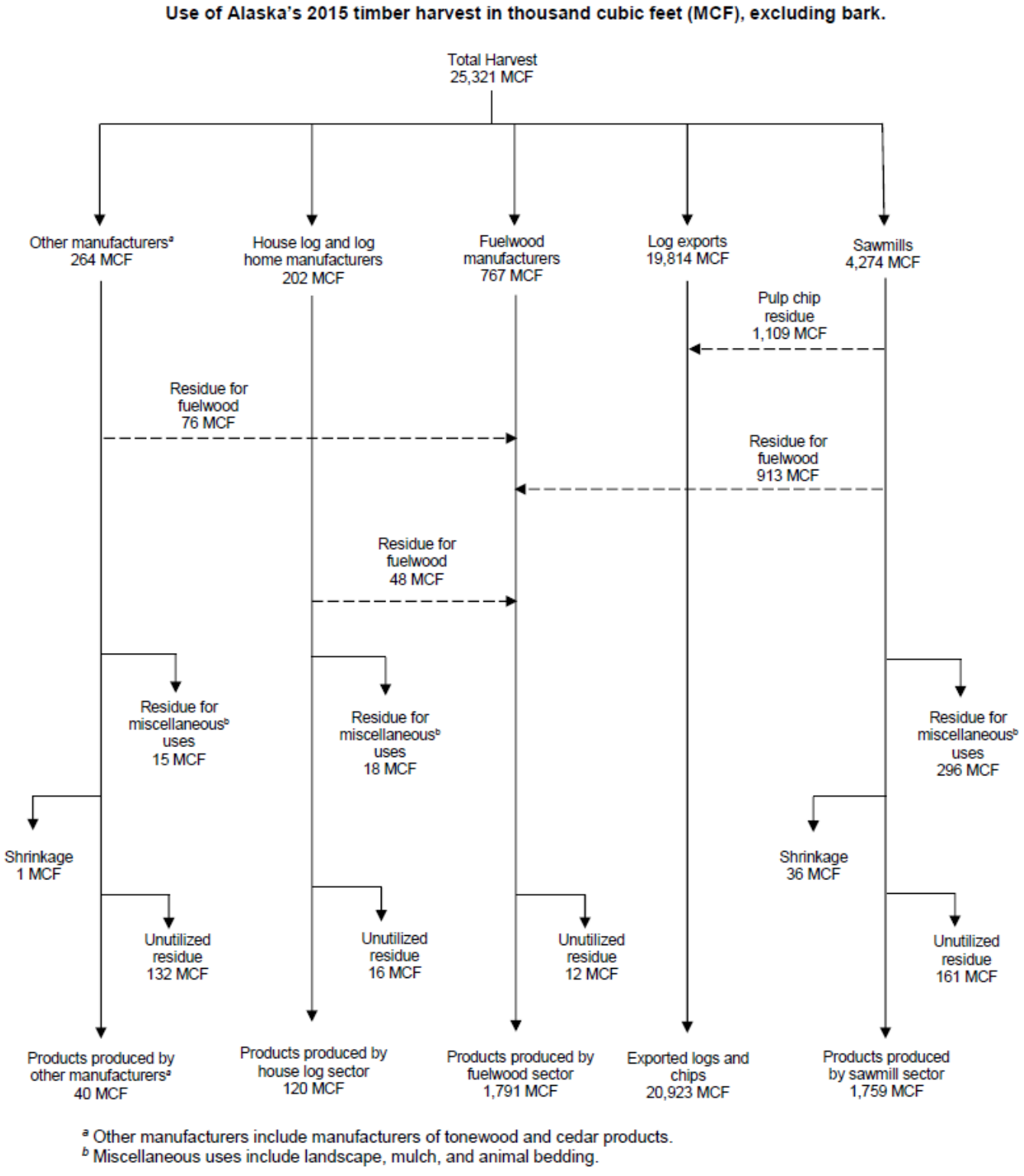

Figure 2 – Utilization of Alaska's timber harvest, 2015.

Glossary

Board foot – A unit of measure applied to lumber that is 1-ft long, 1-ft wide and 1-in thick (or its equivalent) and also associated with roundwood as to its potential yield of such products.

Board foot to Cubic foot ratio (BFCF) – BBER 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. (2011). Ratios have changed through time as a result of changes in product recovery, residue production, and shifts in log diameter size utilized. BFCF ratios accounted for both primary products and residue volumes.

Bone dry unit (BDU) – The amount of wood residue that weights 2,400 lbs (1,088 kg) at 0 percent moisture content. One BDU equals approximately 9.49 yd^3 or 96 ft^3 of solid wood.

Cubic foot – A unit of true volume that measures 1 ft by 1 ft by 1 ft (30.48 by 30.48 by 30.48 cm).

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.

Lumber recovery factor (LFR) – The volume of lumber recovered (in board feet) per cubic foot of log processed.

Lumber tally – The volume of sawn products, usually expressed in board feet.

Overrun – The volume of lumber actually obtained from a log in excess of the estimated volume of the log, based on log scale.

Product recovery ratios – Finished product volume divided by timber input volume (output in sector specific units per input in Scribner). For sawmills, expressed as MBF lumber tally/MBF log scale (Scribner in this report). Recovery ratios are used to assess recovery trends and in other useful calculations including board feet Scribner per cubic foot of logs processed. An expression of relative mill processing efficiency.

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 lumber tally per shift or per year. Production capacity included in BBER reports is directly reported by facility owners or managers, as thousand board feet (MBF) lumber tally output per work year for sawmills and thousand lineal feet (MLF) of house log output per work year for log home manufacturers.

Recovery – The volume of output per unit of input, a measure of mill efficiency. Recovery factors (output in sector specific units per input in Scribner) are used to express the relationship between inputs

and outputs and are subsequently translated into cubic feet and used to estimate total cubic feet of log input recovered in product.

Residue – The wood-fiber or bark by-product of remaining after timber processing of a primary product like lumber, plywood, posts and poles, house logs, etc. Three types or residue are generally generated:

Coarse – chips, edgings, slabs, trim, mis-cuts, and log ends

Fine – sawdust and planer shavings

Bark.

Residue volume factors – for each industry sector, these factors express the average number of bone dry units (BDU) of residue of various types available per unit of product output.

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

Scaling – Or "log scaling" is the measurement of volume in a log based on specific log rules, for example the Scribner log rule. In this report, all scaled volumes are reported in Scribner. Two versions of Scribner log scale are commonly used – west side and east side. Maximum log length is 40 ft for west-side Scribner and 20 ft for east-side scale.

Scribner – A diagram log rule originating in the 1800s that assumes 1-in (2.54 cm) boards and 0.25 in (0.64 cm) 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 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. 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. BBER 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.