

Timber Products Output (TPO) in the PNW

Todd A. Morgan, CF



October 11, 2017

**Forest Inventory and Analysis Client Meeting
Gresham, OR**



Forest Industry Research

- **State harvest & industry analyses**
- **Logging utilization studies**
- **Regional timber harvest reporting**
- **Quarterly Montana information**
- **Other forest economics projects**



Harvest & Industry Analysis

- **Rocky Mountains & Pacific Coast**
- **Describe industry structure, capacity, condition, and changes**
- **Track wood fiber from forest through primary processing**
- **Associate key economic indicators**

Removals from Forest Inventory



FIA P-2 plots

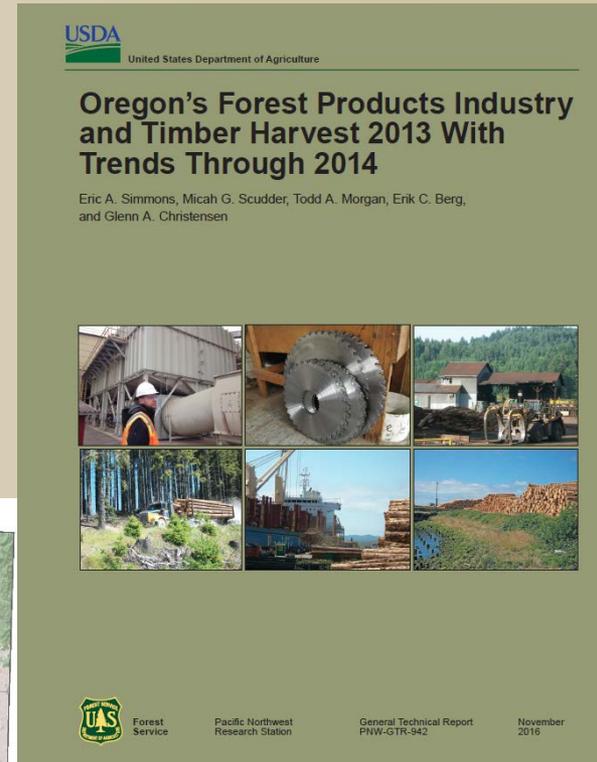
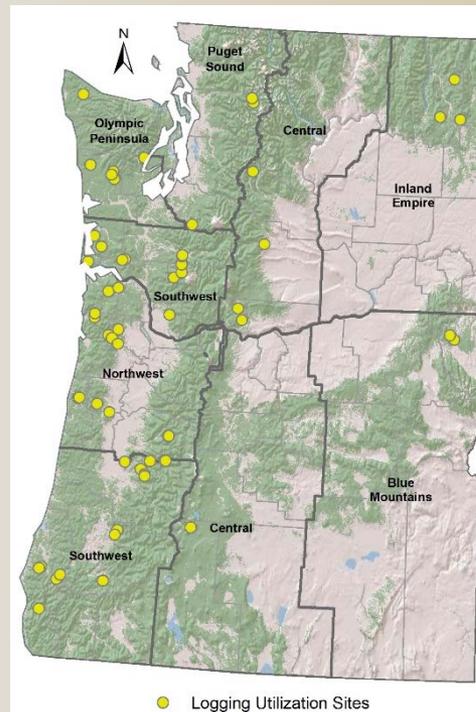
Oregon TPO Activities

Mill Surveys

- 2003, 2008, 2013 - published
- **2017 – data collection begins January 2018**
- **Working with ODF**
- >4 BBF Scribner of timber annually
- >180 facilities
- >\$7 Billion in sales
- >5 BBF of lumber

Logging Residue

- 2011-2015 report published
- Supported by NARA
- 64 OR & WA logging sites
- >1,500 felled trees measured
- Similar utilization results



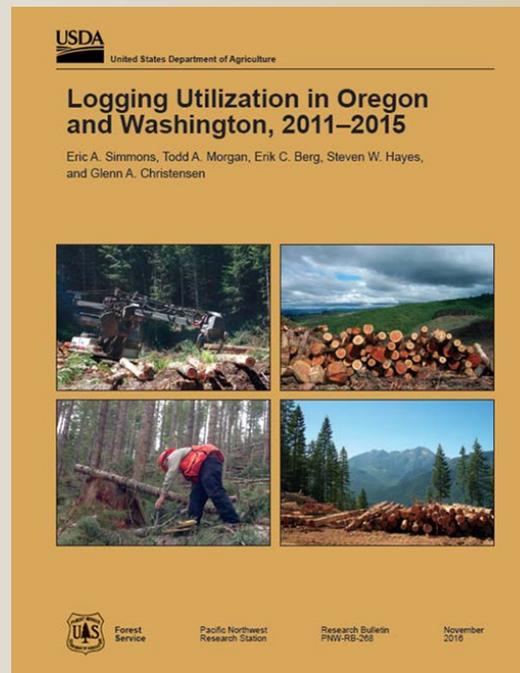
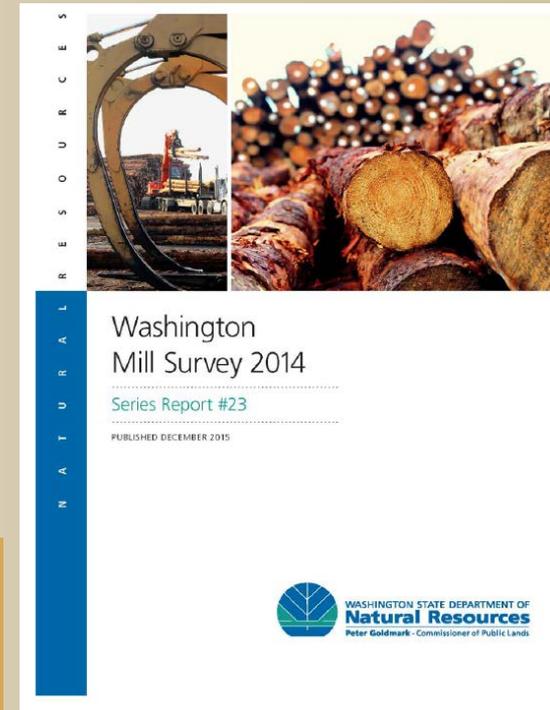
Washington TPO Activities

Mill Surveys

- Conducted by Washington DNR
- Even-numbered years
- **Growing partnership: DNR, FIA & BBER**
- ~ 100 facilities
- >3.5 BBF Scribner of timber annually
- 4 to 5 BBF of lumber

Logging Residue

- 2011-2015 report published
- Supported by NARA
- 64 WA & OR logging sites
- >1,500 felled trees measured
- Similar utilization results



California TPO Activities

Mill Surveys

- 2000, 2006, 2012 - published
- **2016 – data collection ending**
- >1.4 BBF Scribner of timber annually
- >70 facilities
- >\$1.4 Billion in sales
- ~1.9 BBF of lumber

Logging Residue

- 2004 study published in WJAF
- Planning for 2018-2020

California Logging Utilization: 2004

Todd A. Morgan and Timothy P. Spoelma

A study of logging activities conducted during 2004 provided utilization data and information on timber harvesting operations in California. A nested and stratified sampling scheme was used to produce a sample of felled trees with distributions of geographic area, ownership class, tree species, and tree size representative of California's recent sawlog and veneer log harvest. Results of the study indicated that about 50% of the harvested trees were less than 16.5-in.dbh, but these trees produced just 15% of the volume. About 50% of the harvested volume came from trees less than 24.5-in. dbh, and about two-thirds of the volume was from trees less than 30-in. dbh. Removals factors, quantifying impacts on growing stock, revealed that 1,051.4 ft³ of growing-stock volume was removed for every thousand cubic feet delivered to mills, with just 61.5 ft³ left in the forest as logging residue. Periodic reevaluations of logging utilization in California would make it possible to evaluate impacts of technology, market conditions, and policy changes on logging operations and utilization factors in the state.

Keywords: growing-stock removals, logging residue, removals factors, timber harvest



United States Department of Agriculture

California's Forest Products Industry and Timber Harvest, 2012

Chelsea P. McIver, Joshua P. Meek, Micah G. Scudder, Colin B. Sorenson, Todd A. Morgan, and Glenn A. Christensen



Forest Service

Pacific Northwest Research Station

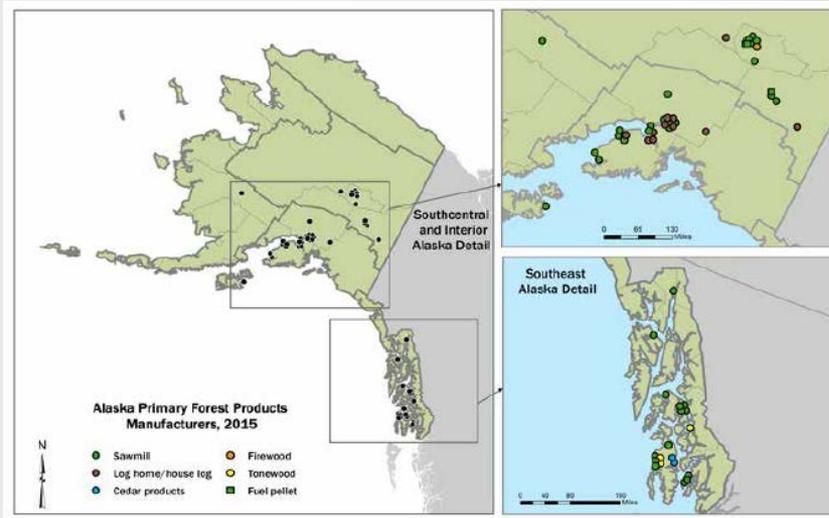
General Technical Report PNW-GTR-908

October 2015

Alaska TPO Activities

Mill Surveys

- 2005, 2011 - published
- **2015 – reports being reviewed**
- 60 small facilities
- >135 MMBF Scribner of timber annually
- >\$110 million in sales (including log exports)



Logging Residue

- Data collection 2016-2019
- Private/Native, Tongass & State sites



FOREST INDUSTRY BRIEF NO. 9

ALASKA'S FOREST PRODUCTS INDUSTRY AND TIMBER HARVEST

PART 3: SALES, EMPLOYMENT AND CONTRIBUTION TO THE STATE'S ECONOMY

BY KATE C. MARCILLE, CHELSEA P. MCIVER, ERIK C. BERG, TODD A. MORGAN AND GLENN A. CHRISTENSEN



FOREST INDUSTRY BRIEF NO. 8

ALASKA'S FOREST PRODUCTS INDUSTRY AND TIMBER HARVEST

PART 2: INDUSTRY SECTORS, CAPACITY AND OUTPUTS

BY KATE C. MARCILLE, ERIK C. BERG, TODD A. MORGAN AND GLENN A. CHRISTENSEN



FOREST INDUSTRY BRIEF NO. 7

ALASKA'S FOREST PRODUCTS INDUSTRY AND TIMBER HARVEST

PART 1: TIMBER HARVEST, PRODUCTS AND FLOW

BY KATE C. MARCILLE, ERIK C. BERG, TODD A. MORGAN AND GLENN A. CHRISTENSEN

INTRODUCTION

This Forest Industry Brief is part of a series of reports presenting findings from a 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.

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 2017). Nearly 72 percent of Alaska's

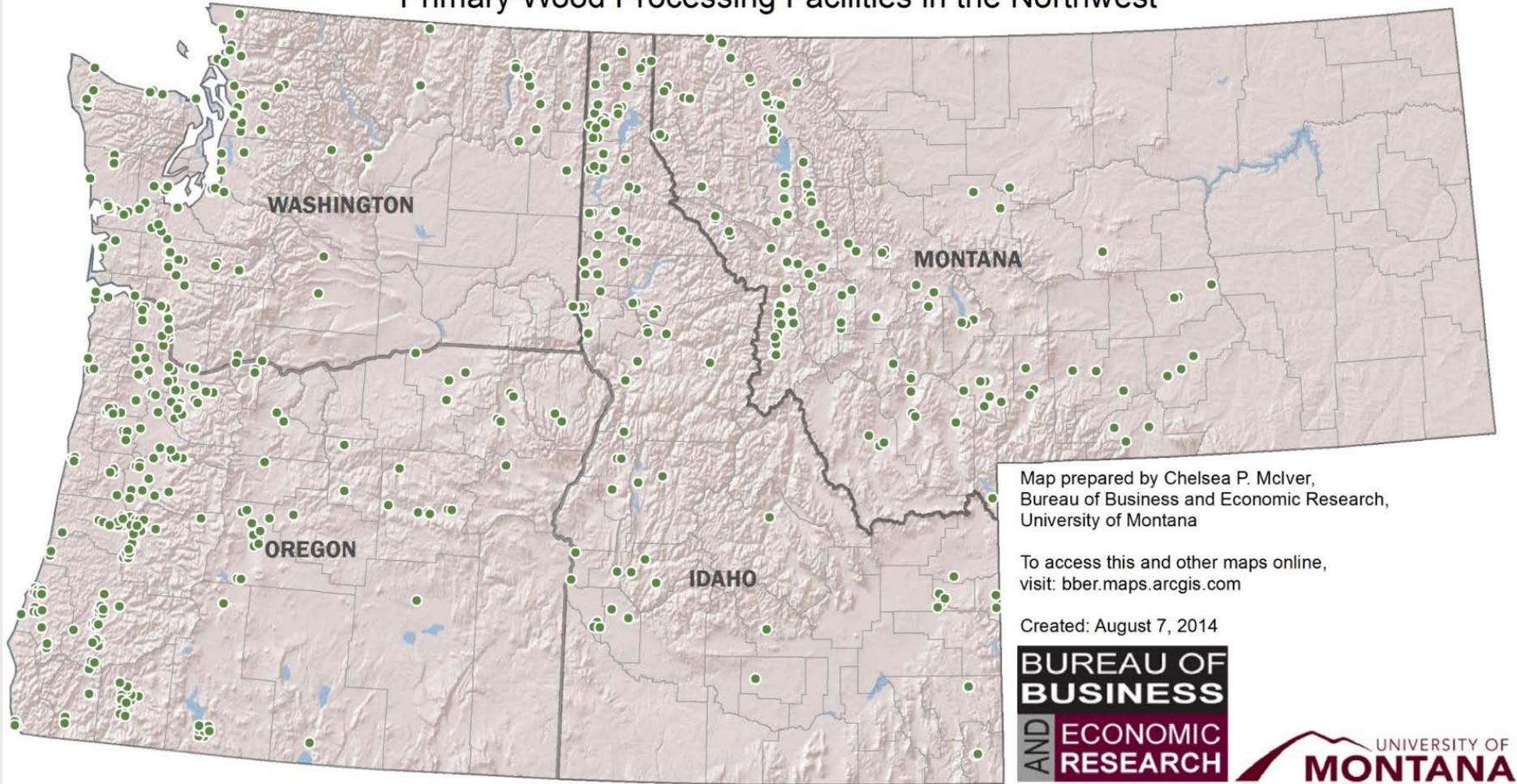
account for approximately 1.3 million acres of Alaska's inventoried timberlands. Alaska has the second lowest proportion of forest land area classified as timberland across all 50 states, with publicly held timberland spanning the largest amount of acreage and containing the majority of sawtimber volume (Figure 1) (Miles 2017).

Similarly, 77 percent – approximately 110,893 million board feet (MMBF) Scribner – of sawtimber volume is found on national forest system land (Christensen 2017). Sitka spruce accounts for roughly 25 percent (34,474 MMBF Scribner) of Alaska's sawtimber volume while western hemlock 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

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Primary Wood Processing Facilities in the Northwest

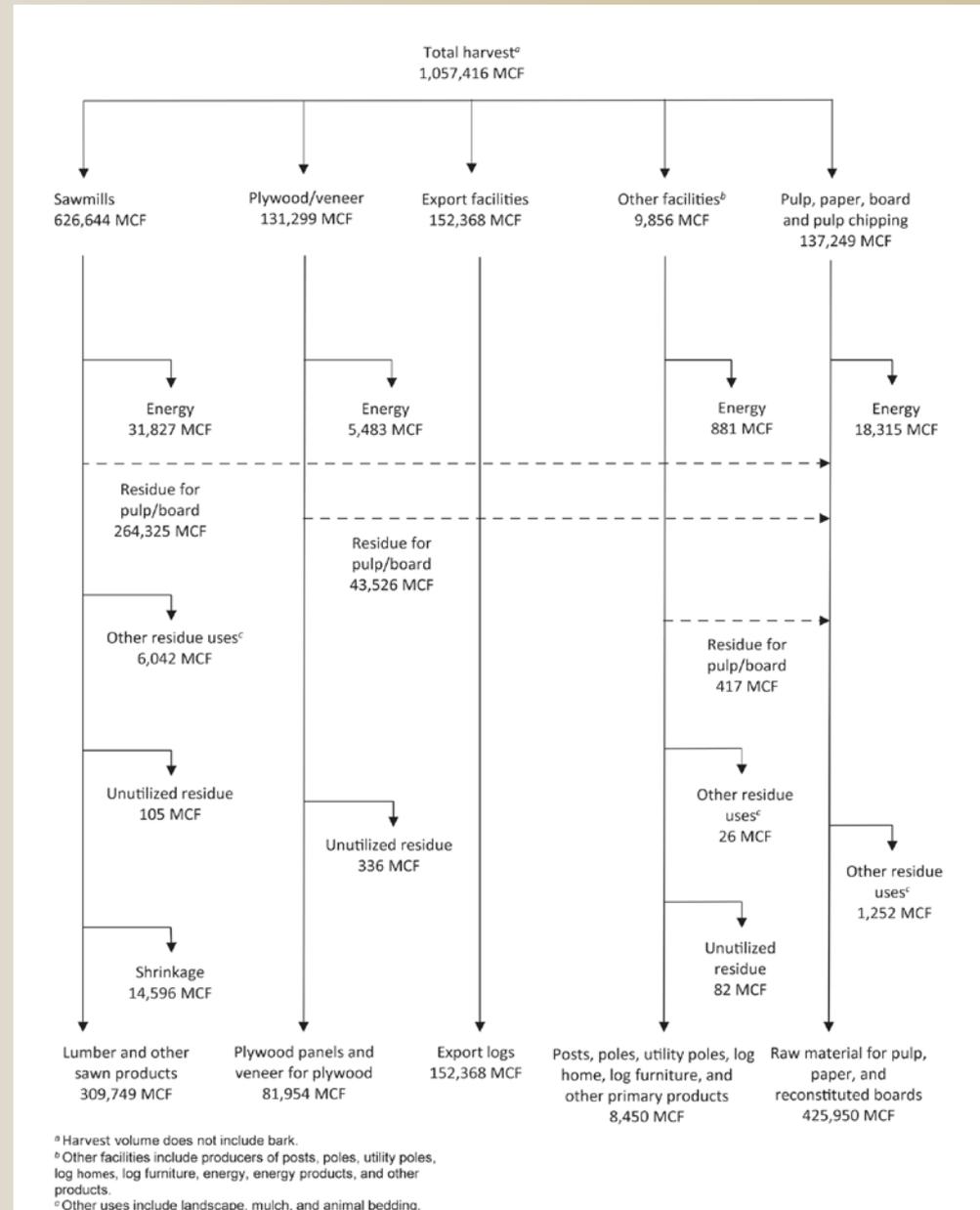


- NARA study: logging & mill residue availability for biojet
- Many low-volume timber-processors across the region
- Larger mills concentrated in western OR & WA, with a few in northern ID & northwestern MT

Oregon Timber Harvest and Use

1,057 MMCF of wood fiber

- 60% to sawmills
- 14% to log exports
- 13% to pulp mills
- 12% to veneer mills
- 60% of mill residue used for pulp & particleboard
- 35% of mill residue used for energy
- 0.5 MMCF (<0.05%) not used



Pacific Northwest Mill Residue

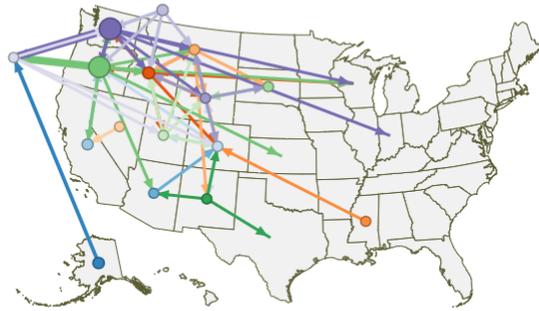
Over 9.2 million BDT of woody mill residue (excluding bark) are generated annually in the 4-state NARA region.
Less than 1% is not used.



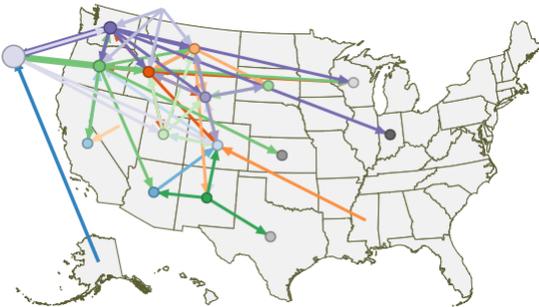
State	<i>thousand dry tons</i>		Total
	Used	Not-used	
ID	1,172.8	8.5	1,181.3
MT	491.7	0.8	492.5
OR	4,775.3	3.6	4,778.9
WA	2,843.2	0.2	2,843.4
	9,283.0	13.1	9,296.1

Timber Flow

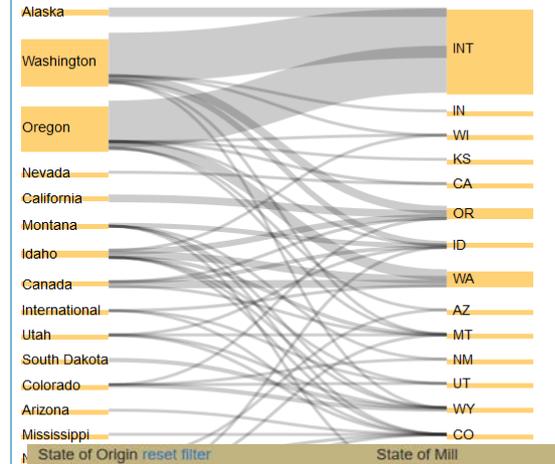
Timber flowing out of the states



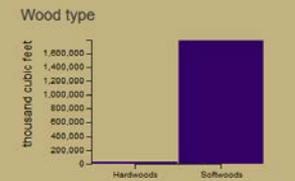
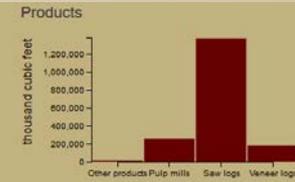
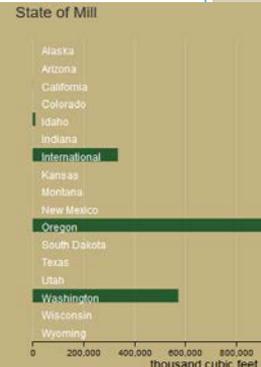
Timber flowing into the states



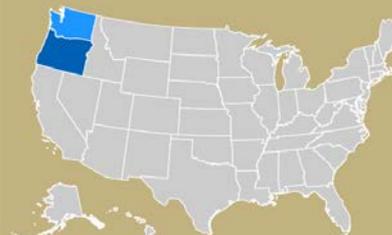
Sankey diagram



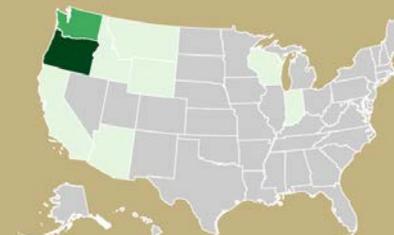
- County of origin & destination
- Product type
- Species
- Ownership class



Origin location



Mill location



Timber Flow & Milling Capacity



FOREST INDUSTRY TECHNICAL REPORT NO. 1

SUMMER 2017

TIMBER-PROCESSING CAPACITY NEAR NATIONAL FORESTS RIO GRANDE NATIONAL FOREST, COLORADO

BY CHELSEA P. MCIVER, ERIC A. SIMMONS AND TODD A. MORGAN

INTRODUCTION

In order for land management agencies to meet societal expectations for wood products, wildfire risk reduction, and other goods and services, managers need accurate and up-to-date information on the ability of markets to utilize timber of various sizes and variable quality. Timber harvesting also creates opportunities to offset the cost of treatments while producing value-added products. This series of fact sheets on timber-processing capacity were prepared as forest planning support documents through a cooperative agreement with Region 2 of the U.S. Forest Service.

The 2016 report on the health of Colorado's forests (State of Colorado 2017) identified 350,000 acres of forest impacted by the spruce beetle, ranking it as the most widespread and damaging forest insect pest for the fifth consecutive year. Notable counties impacted by the spruce beetle include much of the Rio Grande National Forest. Statewide, there are an estimated 834 million standing dead trees at risk of contributing to large, intense wildfires.

To mitigate this risk, treatments designed to restore ecological condition and function, and reduce fire hazard, will require the removal of a mix of timber valuable enough to offset some of the costs, along with smaller trees with limited value and markets. The loss of milling infrastructure throughout the West and in Colorado raises questions about the industry's capability to process trees of various sizes (Keegan et al. 2005, 2006).

TIMBER HARVEST TRENDS IN COUNTIES CONTAINING RIO GRANDE NATIONAL FOREST NON-RESERVED TIMBERLAND

Rio Grande National Forest non-reserved timberland is located in five Colorado counties: Conejos, Hinsdale, Mineral, Rio Grande and Saguache (Figure 1). Nearly 90 percent of the non-reserved timberland in these five counties is owned and

RIO GRANDE NATIONAL FOREST

Acres of non-reserved timberland: 1,292,641

2016 Rio Grande National Forest timber harvest: 11,893 MMBF, Scribner

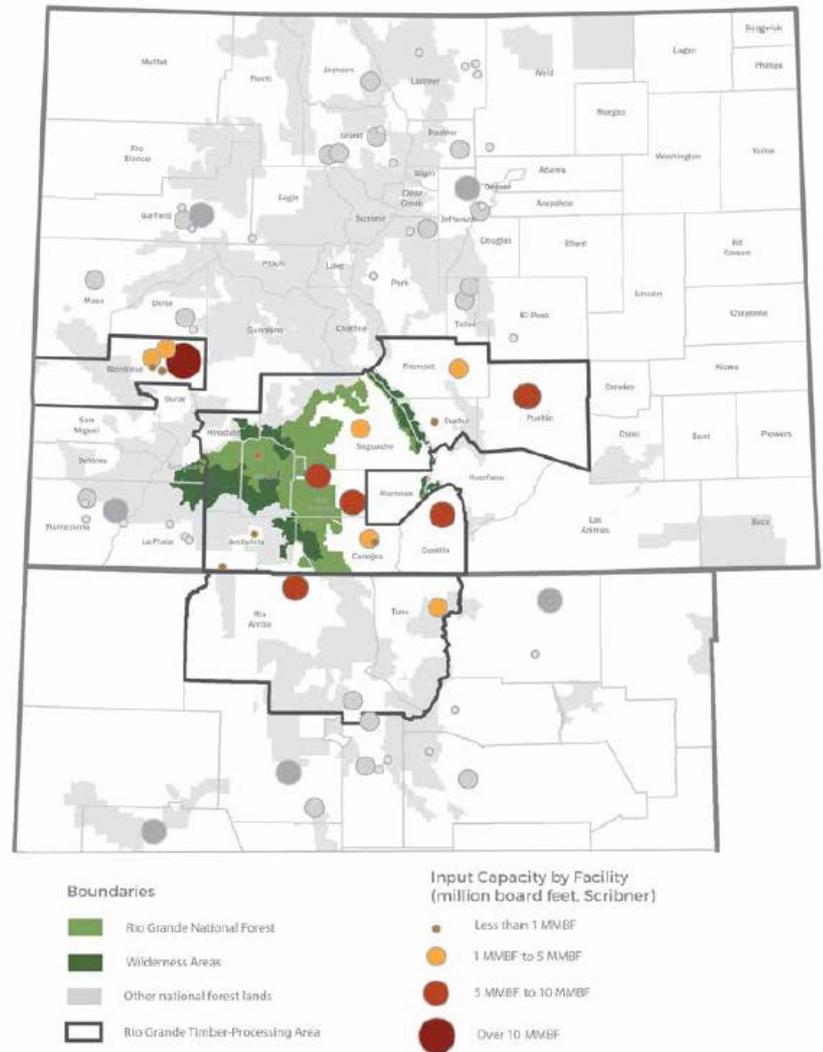
Timber-processing area (TPA): 13 counties in two states

Number of active timber processors in TPA: 21

Total capacity to process timber in TPA: 81,388 MMBF, Scribner

managed by the U.S. Forest Service (USFS). The total volume of timber harvested and processed into a value-added product from all ownerships in the five-county study area was 6,297 thousand board feet (MBF), Scribner in 2012 (Sorenson and

Figure 2. Rio Grande National Forest timber-processing area and facilities.



Timber-processing Capacity & Capability

- Quantify the volume that mills can vs. do process by tree dbh
- NFS forest- & project- level planning
- Identify opportunities & limitations

Table 2. Annual capacity and capability to process trees by size class in the Rio Grande National Forest timber-processing area, 2016.

Tree diameter at breast height (dbh)	Capacity	Use	Timber Use	Capacity utilized
	----- Thousand board feet, Scribner -----		Percent	Percent
Less than 10 in.	9,301	6,371	15%	69%
10 in. and over	72,087	35,566	85%	50%
Total capacity	81,388	41,937	100%	53%

idle during that year. Approximately 75 percent of the timber received by mills in the TPA originated from national forests, of which 13 percent came from the Rio Grande National Forest. Of the 25 active and idle facilities in the Rio Grande TPA, it is estimated that 16 relied on federal timber for more than 50 percent of their inputs.

TIMBER-PROCESSING CAPACITY AND USE BY SIZE CLASS

Between 2003 and 2012, capacity to process timber in the Rio Grande TPA decreased from 84 MMBF to 69.3 MMBF (million board feet, Scribner), but rebounded to 81.4 by 2016 with the opening of two new mills in the region. Excluding the two new mills that came online at the end of 2016, mills utilized approximately 58 percent of their capacity in 2016.

The authors estimate up to 12 percent (9,301 MBF) of the 81,388 MBF of existing capacity in the Rio Grande TPA was capable of processing trees <10 inches dbh, with as much as 69 percent of that capacity utilized. However, in 2016, trees <10 inches dbh accounted for 15 percent of total timber use in 2016 (Table 2).

An additional 1,113 MBF of capacity existed among inactive facilities, of which 242 MBF was estimated to be capable of processing trees <10 inches dbh, should they come back online.

recover economic value from the material. Mills reported on their capability to process primarily dead timber, citing their capability to process timber <10 inches dbh would be greater if

DEFINITIONS

Timber-processing area – The group of counties where a majority of timber from an area of interest are processed into value-added products.

Timber-processing capacity - The total volume of timber (excluding pulpwood) that existing timber processors can utilize annually. It is a measure of the volume of logs that mills can process in a given year, given firm market demand and sufficient raw material. Estimates in this report include the capacity of active facilities, as well as idle facilities with equipment still in place. This analysis focuses on facilities that exclusively use timber in round form; this includes sawmills and facilities making house logs/log homes, posts and small poles, and log furniture. It does not include pulp mills or facilities which may use a mix of roundwood and mill residuals like sawdust, chips or bark.

Logging Utilization Studies

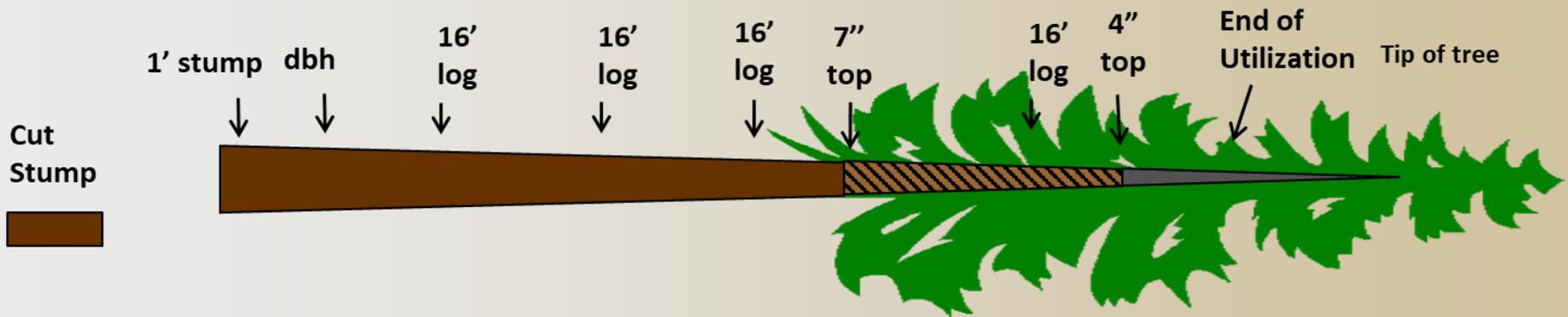
- State-by-state
- Sample 20-30 active logging sites
- Site information from loggers & foresters
- Measure ~ 25 felled trees per site
- Focus on growing-stock & use



Logging Utilization Methods

Felled-tree measurements:

- Record species & cut stump height
- Measure diameters along bole at key points & sections $\leq 16'$ from ground to tip of main stem
- Identify each bole section as used (product) or not (residue)
- Biomass measures: 1st order branch, bark thickness



TPO Logging Residue Results

Over 7 million BDT of timber harvest residue generated annually in the 4-state NARA region.



	<i>thousand dry tons</i>		
State	Private	Public	Total
ID	387	282	669
MT	179	146	325
OR	3,095	713	3,808
WA	1,840	475	2,315
	5,501	1,616	7,117

TPO (timber product output):

FIA data that characterize removals & wood use:

- timber harvested for products
- associated harvest/logging residue
- mill residue

National data

- county level
- periodic → annual

Timber Product Output (TPO) Reports

TPO DOCUMENTATION AND INFORMATION ABOUT THE TPO/RPA DATA:

DESCRIPTION	LINK
State Level Core Tables	State Level Core Tables
Recent RPA/TPO publications	Recent TPO/RPA PUBLICATIONS
TPO Documentation	TPO Documentation
TPO DATA DICTIONARY and USERS GUIDE	TPO Data Dictionary and Users Guide
The RPA and TPO Data Years per Product tables in RPA publications	
RPA 1997	see Appendix Table A-3, Rates of source data for RPA inventory and removals statistics
RPA 2002	see Appendix Table A-3, Rates of source data for RPA inventory and removals statistics
RPA 2007	see Appendix Table A-1, Rates of inventory data by subregion and State
RPA 2012	see Appendix Table A-1, Rates of inventory data by subregion and State
TPO Summary Sheet volume of removals by removals class per State/Report Year	TPO_PER_STATE_SUMMARY_SHEET
TPO Summary Sheet volume of removals by removals class per SRS region/Report Year	TPO_SRS_SUMMARY_SHEET
RPA Summary Sheet volume of removals by removals class per region and subregion RPA	RPA_SUMMARY_SHEET2
TPO/RPA Posting Dates	TPO/RPA POSTING DATES

WEBSITE CITATION:

comments	citation
If you are using the most current RPA data then you would use 2012 for the year.	U.S. Department of Agriculture, Forest Service. 2012. Timber Product Output (TPO) Reports. Knoxville, TN: U.S. Department of Agriculture Forest Service, Southern Research Station. http://srsfia2.fs.fed.us/php/tpo_2009/tpo_rpa_int1.php . [Date accessed: Month da, year]
If you are using the SRS database that is changing such as the TPO database you can use [n.d.] for the data	U.S. Department of Agriculture, Forest Service. [N.d.]. Timber Product Output (TPO) Reports. Knoxville, TN: U.S. Department of Agriculture Forest Service, Southern Research Station. http://srsfia2.fs.fed.us/php/tpo_2009/tpo_rpa_int1.php . [Date accessed: Month da, year]

TPO CONTACT INFORMATION

If you have questions about the TPO data please contact the following people:

AREA	CONTACT
Southern Research Station Data	James Bentley
Northern Research Station Data	Don Pua
Rocky Mountain Research Station Data	Todd Moran
Pacific Coast Data	Todd Moran

report program bugs/problems to: [Helen Dereaford](#)

Two similar RPA / TPO applications are offered here.
Tables may be generated for:
the United States, FIA Regions (Northeast, North Central, Southern, Rocky Mountains or Pacific Coast), State(s), and/or Counties.

National RPA reports The National RPA application generates tables based on RPA report years only
 National TPO reports The National TPO application generates tables based on regional report years.

https://srsfia2.fs.fed.us/php/tpo_2009/tpo_rpa_int1.php

Thank you!



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