



TIMBER-PROCESSING CAPACITY NEAR NATIONAL FORESTS

RIO GRANDE NATIONAL FOREST, COLORADO

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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 MBF, Scribner

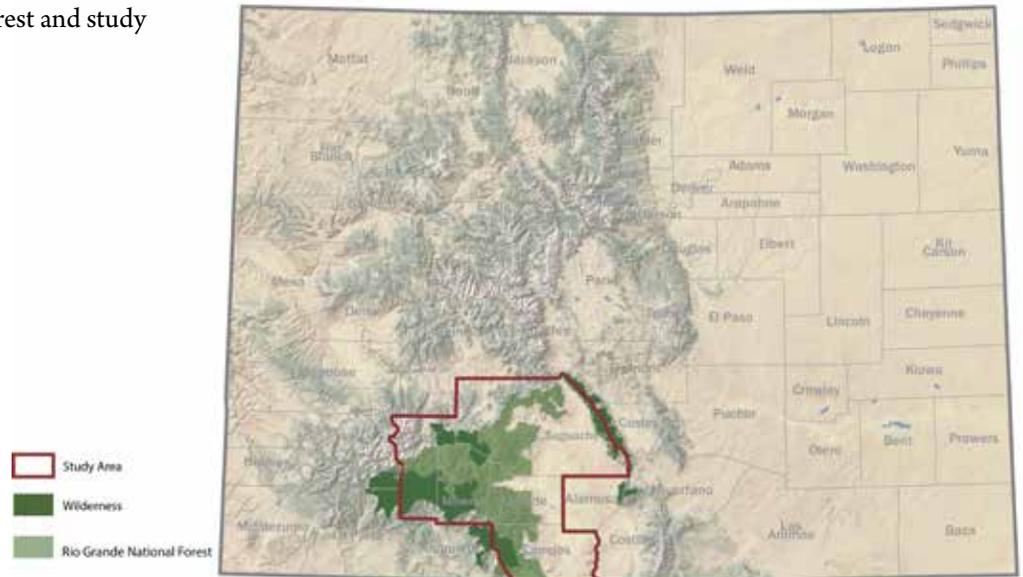
Timber-processing area (TPA): 13 counties in two states

Number of active timber processors in TPA: 21

Total capacity to process timber in TPA:
81,388 MBF, 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 1. Rio Grande National Forest and study area.



others 2016). It is estimated that in 2016, the total volume increased by over 4,000 MBF as a result of increased harvesting in response to the spruce beetle and western spruce budworm epidemics on the Rio Grande National Forest (USFS 2016). The authors estimate that an additional 3,313 MBF of fuelwood and miscellaneous convertible material was harvested on the Rio Grande National Forest in 2016, but not utilized for commercial products.

The species composition of the harvested volume in the study area was estimated to consist of primarily Engelmann spruce with smaller volumes of aspen, Douglas fir, ponderosa pine, lodgepole pine and subalpine fir. Due to the impact of the spruce beetle and other forest pests, the majority of the timber harvested and utilized from these counties consisted of dead trees (R. Reinschmidt, USFS R2 South Zone Contracting Officer, pers. comm.). In 2012, sawmills received 96 percent of the timber harvested and utilized from these counties; the

remaining volume was processed by house log, and post and small pole manufacturers.

RIO GRANDE TIMBER-PROCESSING AREA

The Rio Grande National Forest Timber-Processing Area (TPA) includes 13 counties: Archuleta, Conejos, Costilla, Custer, Fremont, Hinsdale, Mineral, Montrose, Pueblo, Rio Grande and Saguache counties in Colorado, and the northern portions of Rio Arriba and Taos counties in New Mexico (Figure 2).

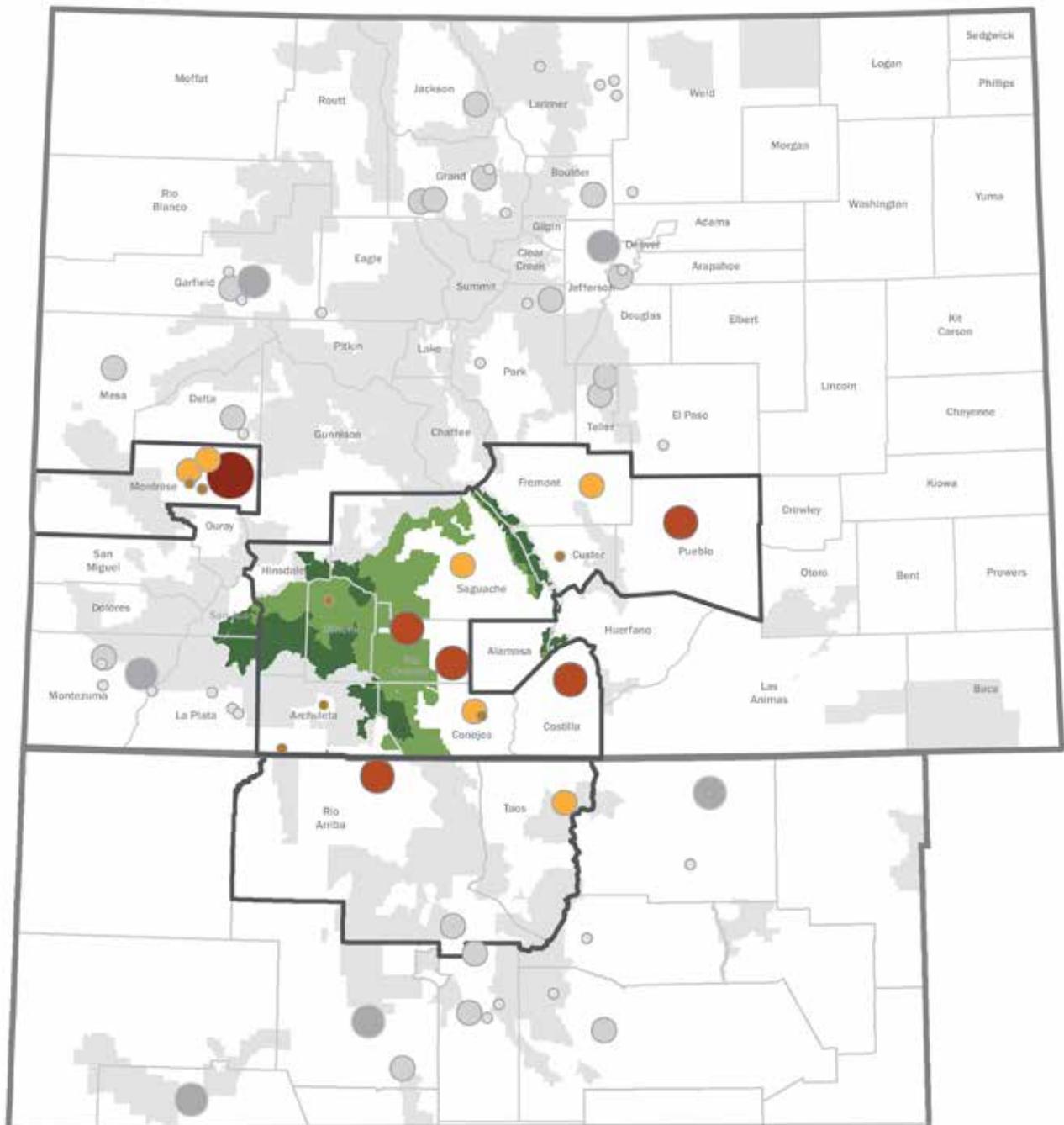
Within the Rio Grande National Forest TPA there were 21 facilities operating as of 2016: 14 sawmills, six log home manufacturers and one viga manufacturer (Table 1). Five of the 12 sawmills reported producing substantial volumes of secondary products, such as posts and poles or house logs. In addition, there was one sawmill, one co-located sawmill and post and pole plant, and one log furniture manufacturer that were

Table 1. Active timber-processing facilities in the Rio Grande National Forest timber-processing area, selected years.

Type	2003	2007	2012	2016
Sawmills	22	13	13	14
Log home	15	6	5	6
Log furniture	3	2	0	0
Vigas and latillas	3	1	1	1
Post and pole	2	1	0	0
Total	45	23	19	21

Sources: Hayes and others, 2012; Sorenson and others, 2016, BBER, N.D.

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



Boundaries

- Rio Grande National Forest
- Wilderness Areas
- Other national forest lands
- Rio Grande Timber-Processing Area

**Input Capacity by Facility
(million board feet, Scribner)**

- Less than 1 MMBF
- 1 MMBF to 5 MMBF
- 5 MMBF to 10 MMBF
- Over 10 MMBF

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)	Capability	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. Overall capacity utilization was low due in part to the inclusion of two new mills, which opened in late 2016, but did not report any timber use for the year.

DISCUSSION

Mills prefer and often process trees that are larger than the smallest tree sizes they are capable of processing, due to higher recovery rates (greater output per unit of input). As documented by Stewart et al. (2004) and others, the profitability of processing timber diminishes as the average diameter of the timber decreases.

Mill owners spoke about the impact that the condition of timber, namely live versus dead, has had on their ability to

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.

Capability - The volume of trees of a certain size class (measured as diameter at breast height, or dbh) that existing timber processors can *efficiently and economically* process annually. Most facilities are designed to operate using trees of a given size class (e.g., veneer/plywood plants typically use trees ≥ 10 inches dbh and post manufacturers primarily use trees < 8 inches dbh). Capability at these facilities is readily classified in just one of the size classes. This is true for some sawmills, but sawmills can vary in equipment, product output and ability to process timber of various sizes.

they were processing green trees, due to the associated higher recovery rates. Similar relationships among recovery, live versus dead trees and log size have been documented in Fahey and others (1986) and Cahey (1980).

Finally, while the region shows unutilized capability to process small diameter timber, some mills reported using greater volumes of small diameter timber than they felt they were capable of efficiently and economically processing. This is likely a reflection of the fact the national forests comprise the overwhelming majority of timberland, and the national forests are offering substantial quantities of small trees and relatively few larger trees in efforts to mitigate the impacts of widespread tree mortality due to insects, such as the spruce beetle.

When planning activities that involve removing trees from the landscape, land managers should balance their need to remove small and/or dead trees with the local industry's ability to profitably use that material. Offering larger quantities of small and/or dead trees than the industry can profitably use can lead to unsold sales and fewer acres being treated.

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