



TIMBER-PROCESSING CAPACITY NEAR NATIONAL FORESTS

GRAND MESA, UNCOMPAHGRE AND GUNNISON NATIONAL FORESTS, 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 576,000 acres of forest impacted by the spruce beetle or western spruce budworm, the former ranking as the most widespread and damaging forest insect pest for the fifth consecutive year. Notable counties impacted by the insects include much of the Grand Mesa, Uncompahgre and Gunnison (GMUG) National Forests. 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 GRAND MESA, UNCOMPAHGRE AND GUNNISON NATIONAL FORESTS NON-RESERVED TIMBERLAND

The Grand Mesa, Uncompahgre and Gunnison National Forests non-reserved timberland is located in seven Colorado counties:

GMUG NATIONAL FORESTS

Acres of non-reserved timberland: 2,254,042

2016 Forest Service timber harvest: 21,041 MBF, Scribner

Timber-processing area (TPA): Seven counties

Number of active timber processors in TPA: 15

Total capacity to process timber in TPA: 55,645 MBF, Scribner

Delta, Gunnison, Mesa, Montrose, Ouray, Saguache and San Miguel (Figure 1). More than 80 percent of the non-reserved timberland in these seven counties is owned and managed by the U.S. Forest Service. The total volume of timber harvested and utilized from all ownerships in the study area was 19,992 MBF Scribner in 2012 (Sorenson and others 2016). It is estimated

Figure 1. GMUG National Forests and study area.



that in 2016, the total volume increased to an estimated 30,000 MBF Scribner as a result of increased harvesting in response to the spruce beetle and western spruce budworm epidemics by federal and other land owners (USFS 2016). Approximately 85 percent of the timber harvested in the study area was processed within the timber-processing area (TPA).

The species composition of the timber harvested in the study area was estimated to consist of primarily Engelmann spruce, lodgepole pine and ponderosa pine with smaller volumes of aspen, Douglas-fir and subalpine fir. Due to the impact of the spruce beetle and other forest insect 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 97 percent of the timber harvested and utilized from these counties; the

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

GRAND MESA, UNCOMPAHGRE AND GUNNISON NATIONAL FORESTS TIMBER-PROCESSING AREA

The GMUG National Forests timber-processing area includes nine counties: Delta, Fremont, Garfield, Gunnison, Mesa, Montrose, Ouray, Saguache and San Miguel counties in Colorado (Figure 2).

Within the GMUG National Forest TPA there were 15 facilities currently operating as of 2016: Nine sawmills, one post and small pole facility and five log home manufacturers; in addition, there was one sawmill and one co-located sawmill and post and pole plant that were idle during that year (Table 1).

Table 1. Active timber processing facilities in the Grand Mesa, Uncompahgre and Gunnison National Forests timber-processing area, selected years.

Type	2003	2007	2012	2016
Sawmills	16	10	11	9
Log home	15	6	5	5
Log furniture	3	1	0	0
Post and pole	1	1	2	1
Total	35	18	18	15

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

Figure 2. GMUG National Forests timber-processing area.

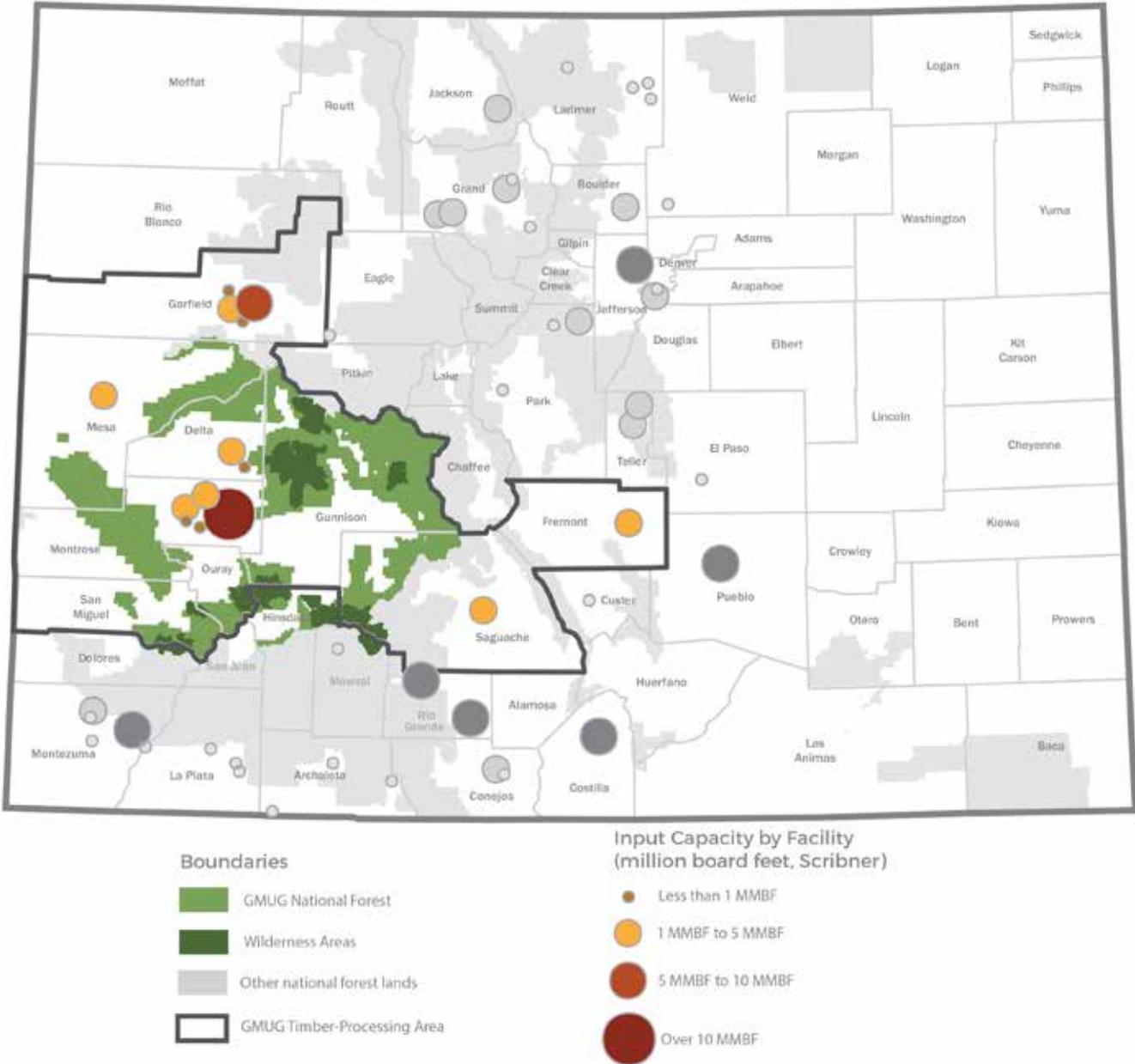


Table 2. Annual capacity and capability to process trees by size class in the GMUG National Forests timber-processing area, 2016.

Tree diameter at breast height (dbh)	Capability	Use	Timber Use	Capacity utilized
	----- Thousand board feet, Scribner -----		Percent	Percent
Less than 10 in.	7,406	5,532	18%	75%
10 in. and over	48,239	24,882	82%	52%
Total capacity	55,645	30,414	100%	55%

TIMBER-PROCESSING CAPACITY AND USE BY SIZE CLASS

Since 2003, capacity to process timber in the GMUG TPA has decreased from 77.5 MMBF to 55.1 MMBF due to a combination of mill closures, as well as technological upgrades to existing mills expanding their capacity and increasing their efficiency. Mills utilized approximately 55 percent of their capacity in 2016.

The authors estimate that up to 13 percent (7,406 MBF) of the 55,646 MBF of existing capacity in the GMUG TPA was capable of processing trees <10 inches dbh, with 75 percent of that capacity utilized in 2016. However, as a proportion of their total timber processed, trees <10 inches dbh accounted for 18 percent of mills total timber use in 2016 (Table 2).

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 also spoke to the impact that the condition of timber, namely live versus dead, has 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 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 by Fahey, Snellgrove and Plank (1986).

Finally, while the region shows unutilized capability to process timber, 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 that 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.

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.

When planning activities that involve removing trees from the landscape, land managers need to 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 will lead to unsold sales and fewer acres being treated.

REFERENCES

Fahey, Thomas D.; Snellgrove, Thomas A.; Plank, Marlin E., 1986. "Changes in Product Recovery between Live and Dead Lodgepole Pine: A Compendium." Research Paper PNW-RP-353. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Rangeland Experiment Station. 32 p.

Keegan, Charles E.; Morgan, Todd A.; Wagner, Francis G.; Cohn, Patricia J.; Blatner, Keith A.; Spoelma, Timothy P.; Shook, Steven R., 2005. "Capacity for Utilization of USDA Forest Service, Region 1 Small-diameter Timber." *Forest Products Journal* 55(12): 143-147.

Keegan, Charles E.; Morgan, Todd A.; Gebert, Krista M.; Brandt, Jason P.; Blatner, Keith A.; Spoelma, Timothy P., 2006. "Timber-Processing Capacity and Capabilities in the Western United States." *Journal of Forestry* 104(5): 262-268.

Sorenson, Colin B.; Hayes, Steven W.; Morgan, Todd A.; Simmons, Eric A.; Scudder, Micah G.; McIver, Chelsea P.; Thompson, Mike T., 2016. "The Four Corners Timber Harvest and Forest Products Industry, 2012." *Resour. Bull. RMRS-RB-21*. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 62 p.

State of Colorado, 2017. "2016 Report on the Health of Colorado's Forests: Fire and Water." Denver, CO: Colorado Department of Natural Resources. 36 p.

Stewart, Hayden G.; Blatner, Keith A.; Wagner, Francis G.; Keegan, Charles E., 2004. "Risk and Feasibility of Processing Small-diameter Material in the U.S. West, Part I: Structural Lumber." *Forest Products Journal* 54(12): 97-103.

U.S. Forest Service (USFS), 2016. "Forest Products Cut and Sold from the National Forests and Grasslands." U.S. Department of Agriculture. Accessed December 7. <https://www.fs.fed.us/forestmanagement/products/cut-sold/index.shtml>

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