



**FOREST INDUSTRY  
RESEARCH PROGRAM**  
UNIVERSITY OF MONTANA

# **Timber Processing Capacity and Capability: Southwest Colorado Collaborative Forest Landscape Restoration Project**

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## Introduction

The Southwest Colorado (SWCO) Collaborative Forest Landscape Restoration Project (CFLRP) covers close to 2 million acres of national forest and private lands in southwest Colorado. The privately held portion includes non-industrial private lands and Tribal lands. The project boundaries contain most of San Juan National Forest, including the southern San Juan Mountains. According to the SWCO CFLRP proposal (2020), the primary concern for the area is wildfire risk.

The loss of milling infrastructure in Colorado and throughout the West (Keegan 2006) brings into question whether there is sufficient unused capacity at timber processing facilities in surrounding areas to process removals from the Southwest Colorado landscape. In particular, is there capacity to process trees of a smaller diameter class ( $\leq 7$  inches dbh)?

The data used to develop the information presented in this report were collected and processed by the University of Montana's Forest Industry Research Program (FIRP) within the Bureau of Business and Economic Research (BBER). Additional information is available upon request; however, mill- or company-level data are confidential and will not be released.

## Timber harvest and processing trends related to the Southwest Colorado CFLRP

The SWCO CFLRP contains portions of Archuleta, Dolores, Hinsdale, La Plata, Mineral, Montezuma, Rio Grande, San Juan and San Miguel counties in Colorado (figure 1). Together, the total area of these counties covers close to 7 million acres, and they constitute the "Study Area" in this report. Analysis of timber flow indicates that timber harvested in the SWCO Study Area is processed by facilities located inside and outside the Study Area. All counties that contain one or more facilities that process timber harvested in the Study Area constitute the "Timber Processing Area" or TPA. The TPA for Southwest Colorado includes the nine counties within the Study Area, as well as Alamosa, Conejos, Delta, Montrose, Park and Saguache counties in Colorado and Colfax and Rio Arriba counties in New Mexico. Some counties within the SWCO Study Area do not contain any timber processing facilities.

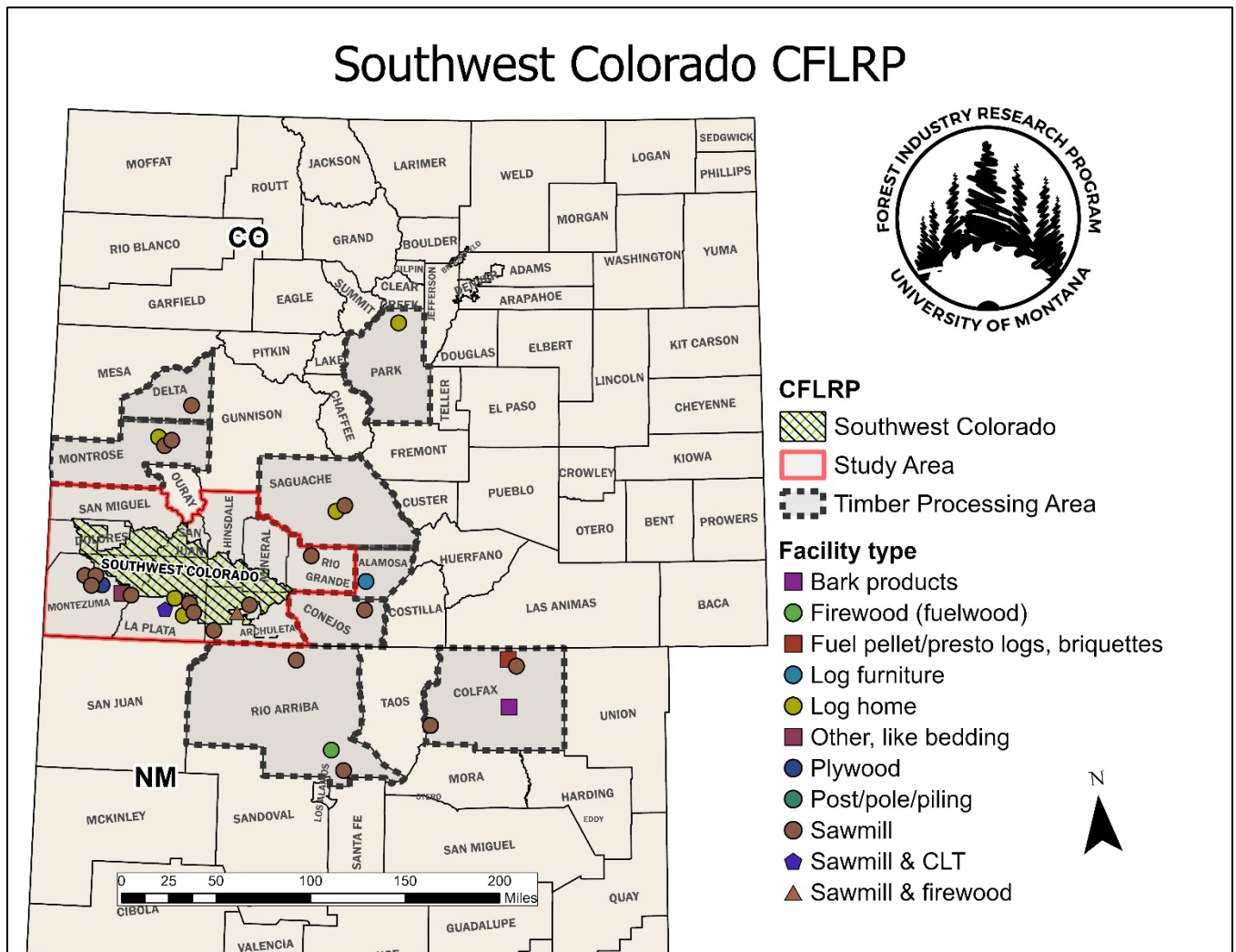
The facilities within the SWCO TPA are listed in table 1 and include 22 sawmills (one of which also produces firewood and one that also produces cross-laminated timber), 5 log home facilities, 1 log furniture facility, 1 plywood facility, 1 fuel pellet facility, 1 bark product facility, 1 post/pole/piling facility, 1 firewood facility, and 1 producer of other products, such as animal bedding. Five facilities were previously unknown to the analysts and thus could not be included in this analysis.

**Table 1. Southwest Colorado CFLRP timber-processing facilities<sup>a</sup>.**

Facility name	Facility type	State	County	Current Facility Status	Included in log-processing capacity analysis
Rustic Log Furniture	Log furniture	CO	Alamosa	Active	Yes
Forest Health Timber Products	Sawmill	CO	Archuleta	Active	No
Loblolly Logging and Lumber - Arboles	Sawmill	CO	Archuleta	Active	Yes
Loblolly Lumber - Pagosa	Sawmill	CO	Archuleta	Active	Yes
Stateline Firewood	Sawmill & firewood	CO	Archuleta	Active	No
Allpine Lumber Co.	Sawmill	CO	Conejos	Active	Yes
Redemption Mill	Sawmill	CO	Delta	Active	Yes
Eric Husted	Sawmill	CO	La Plata	Active	Yes
Mule Skinner Log Works	Log home	CO	La Plata	Active	Yes
San Juan Structures	Log home	CO	La Plata	Active	Yes
Timber Age Systems	Sawmill & CLT	CO	La Plata	Active	No
Wildcat Services	Sawmill	CO	La Plata	Active	No
Aspen Wall Wood	Sawmill	CO	Montezuma	Active	Yes
Aspen Wood Products	Other, like bedding	CO	Montezuma	Active	Yes
Ironwood Group LLC	Plywood	CO	Montezuma	Active	Yes
Ott's Mill	Sawmill	CO	Montezuma	Active	Yes
Stonertop Lumber	Sawmill	CO	Montezuma	Active	Yes
West Fork Lumber	Sawmill	CO	Montezuma	Inactive	Yes
Custom Log Crafting	Sawmill	CO	Montrose	Inactive	Yes
Frontier Log Homes	Log home	CO	Montrose	Active	Yes
Montrose Forest Products, LLC.	Sawmill	CO	Montrose	Active	Yes
Alan Eos Mountain Lumber	Sawmill	CO	Park	Active	Yes
TJ's Wood Products	Log home	CO	Park	Active	Yes
Rocky Mountain Timber Products	Sawmill	CO	Rio Grande	Active	Yes
Mountain Valley Lumber - House logs	Log home	CO	Saguache	Active	Yes
Mountain Valley Lumber - Sawmill	Sawmill	CO	Saguache	Active	Yes
Mammoth Mill & Construction	Sawmill	NM	Colfax	Active	Yes
Silver Dollar Wood Products LLC	Bark products	NM	Colfax	Active	No
Western Wood Products	Sawmill	NM	Colfax	Active	Yes
Western Wood Products (pellets)	Fuel pellets	NM	Colfax	Active	No
Western Wood Products (posts)	Post/pole/piling	NM	Colfax	Active	Yes
Padilla Logging Restoration	Firewood	NM	Rio Arriba	Active	No
Satterwhite Log Homes	Sawmill	NM	Rio Arriba	Active	Yes
W. H. Moore Cash Lumber	Sawmill	NM	Rio Arriba	Active	Yes

<sup>a</sup>Highlighted facilities are new to BBER and without data for capacity calculations.

Figure 1. The Southwest Colorado CFLRP, Study Area, Timber Processing Area, and facilities.



## Timber harvest within the Southwest Colorado CFLRP Study Area

The total volume of timber harvested from the SWCO Study Area and processed into commercial products was estimated at 98,951 hundred cubic feet (CCF) or 42,906 thousand board feet (MBF), Scribner in 2020. Dolores County produced the greatest share of the harvest, at 32,447 CCF (13,616 MBF) or 33 percent of the total volume, which constituted a sharp increase over the 2016 harvest of 8,953 CCF (2,869 MBF). Dolores County 2020 harvest volume was followed by Montezuma County at 31,818 CCF (13,320 MBF) or 32 percent of the total, which also constituted a sizeable increase over 2016. San Miguel County has had only minor harvest volumes in recent years and San Juan County showed no harvest in any of the reported years.

**Table 2. Timber harvest by county in the Southwest Colorado Study Area in thousand board feet, Scribner (MBF) and hundred cubic feet (CCF), 2012, 2016, and 2020.**

Study Area	2012			2016			2020		
	MBF	CCF	Percent	MBF	CCF	Percent	MBF	CCF	Percent
Archuleta County, CO	890	1,912	7%	3,548	8,096	11%	344	1,012	1%
Dolores County, CO	3,000	8,981	31%	2,869	8,953	12%	13,616	32,447	33%
Hinsdale County, CO	-	-	0%	12,898	32,970	43%	945	1,994	2%
La Plata County, CO	510	1,235	4%	2,666	4,899	6%	2,902	5,423	5%
Mineral County, CO	629	1,428	5%	1,257	2,692	4%	3,596	7,597	8%
Montezuma County, CO	2,202	5,585	19%	2,995	6,986	9%	13,320	31,818	32%
Rio Grande County, CO	4,313	9,868	34%	5,418	11,390	15%	7,322	16,832	17%
San Juan County, CO	-	-	0%	-	-	0%	-	-	0%
San Miguel County, CO	25	59	<1%	230	413	1%	861	1,828	2%
<b>Total</b>	<b>11,569</b>	<b>29,069</b>	<b>100%</b>	<b>31,881</b>	<b>76,399</b>	<b>100%</b>	<b>42,906</b>	<b>98,951</b>	<b>100%</b>

Sawlogs and veneer logs constituted the largest portion of the timber products harvested in the SWCO Study Area in 2020, at 82 percent of total harvest volume (81,520 CCF or 37,391 MBF) (table 3). Fiber logs constituted 11 percent or 11,186 CCF (3,300 MBF) of harvested volume. The remaining 7 percent consisted of house logs, firewood logs, furniture logs and post/pole logs.

**Table 3. Timber harvest by product in the Southwest Colorado Study Area in thousand board feet, Scribner (MCF) and hundred cubic feet (CCF), 2012, 2016, and 2020.**

Product	2012			2016			2020		
	MBF	CCF	Percent	MBF	CCF	Percent	MBF	CCF	Percent
Sawlog and veneer logs	7,444	17,230	59%	26,711	54,833	72%	37,391	81,520	82%
Post or pole log	-	-	0%	742	7,347	10%	157	633	1%
House log	1,530	3,188	11%	1,743	3,839	5%	1,733	3,573	4%
Fiber log	2,480	8,267	28%	2,530	9,036	12%	3,300	11,186	11%
Firewood log	115	383	1%	30	107	0%	185	717	1%
Furniture log	0	1	0%	125	1,238	2%	140	1,321	1%
<b>Total</b>	<b>11,569</b>	<b>29,069</b>	<b>100%</b>	<b>31,881</b>	<b>76,399</b>	<b>100%</b>	<b>42,906</b>	<b>98,951</b>	<b>100%</b>

The dominant species harvested within the SWCO Study Area in 2020 was Engelmann spruce, which constituted 39 percent of the harvest volume (38,193 CCF or 17,985 MBF) (table 4). Species such as quaking aspen and ponderosa pine made up 20 and 14 percent of total harvest volume, respectively, whereas subalpine fir constituted 9 percent and white fir and Douglas-fir constituted 8 percent each of the total 2020 harvest.

**Table 4. Timber harvest by species in the Southwest Colorado Study Area in thousand board feet, Scribner (MBF) and hundred cubic feet (CCF), 2012, 2016, and 2020.**

Species	2012			2016			2020		
	MBF	CCF	Percent	MBF	CCF	Percent	MBF	CCF	Percent
White fir	-	-	0%	91	159	0%	3,298	7,582	8%
Subalpine fir	127	295	1%	460	959	1%	3,691	8,416	9%
Englemann spruce	4,486	10,205	35%	12,094	26,758	35%	17,985	38,193	39%
Lodgepole pine	727	1,681	6%	10,860	26,412	35%	1,355	3,166	3%
Ponderosa pine	1,394	3,216	11%	967	1,963	3%	6,066	13,448	14%
Border pinyon	1	1	0%	-	-	0%	-	-	0%
Douglas-fir	504	1,119	4%	1,470	3,009	4%	3,535	8,085	8%
Western redcedar	4	11	0%	-	-	0%	-	-	0%
Quaking aspen	4,321	12,526	43%	5,939	17,139	22%	6,976	20,062	20%
Fremont cottonwood	5	14	0%	-	-	0%	-	-	0%
<b>Total</b>	<b>11,569</b>	<b>29,069</b>	<b>100%</b>	<b>31,881</b>	<b>76,399</b>	<b>100%</b>	<b>42,906</b>	<b>98,951</b>	<b>100%</b>

Harvested timber in the SWCO Study Area in 2020 originated primarily on Forest Service lands. Sixty-seven percent (66,334 CCF or 28,329 MBF) came from the San Juan National Forest, followed by private and Tribal timberland (33 percent). The Study Area's small amount of state-owned lands yielded no harvest volume in 2020 (table 5). These proportions have not changed significantly since 2016.

**Table 5. Timber harvest by ownership in the Southwest Colorado Study Area in thousand board feet, Scribner (MBF) and hundred cubic feet (CCF), 2012, 2016, and 2020.**

Ownership	2012			2016			2020		
	MBF	CCF	Percent	MBF	CCF	Percent	MBF	CCF	Percent
Private timberland	4,393	12,153	42%	11,167	26,413	35%	14,577	32,617	33%
National forest	7,176	16,916	58%	18,860	46,124	60%	28,329	66,334	67%
State	-	-	0%	1,854	3,863	5%	-	-	0%
<b>Total</b>	<b>11,569</b>	<b>29,069</b>	<b>100%</b>	<b>31,881</b>	<b>76,399</b>	<b>100%</b>	<b>42,906</b>	<b>98,951</b>	<b>100%</b>

The SWCO Study Area harvest has seen varying portions of live trees among its harvested volume, going from 62 percent in 2012 to 40 percent in 2016 and 68 percent in 2020 (table 6). While live logs constituted 66 percent of the harvest used in sawmills and for veneer, only 22 percent of house logs were live at the time of harvest in 2020. The proportion of firewood logs that were dead at the time of harvest increased sharply from 14 percent in 2012 to 97 percent in 2020.

**Table 6. Live and dead harvest percentages by log type from the Southwest Colorado CFLRP Study Area, 2012, 2016, and 2020.**

Study Area	2012		2016		2020	
	Live percent	Dead percent	Live percent	Dead percent	Live percent	Dead percent
Saw and veneer logs	58%	42%	39%	61%	66%	34%
Post or pole	0%	0%	27%	73%	80%	20%
House log	62%	38%	22%	78%	22%	78%
Fiber log	70%	30%	71%	29%	100%	0%
Firewood log	86%	14%	42%	59%	3%	97%
Furniture log	0%	100%	0%	100%	100%	0%
<b>Volume-weighted average</b>	<b>62%</b>	<b>38%</b>	<b>40%</b>	<b>60%</b>	<b>68%</b>	<b>32%</b>

### Timber-processing within the Southwest Colorado CFLRP Timber Processing Area

Of the 98,951 CCF (42,906 MBF) of timber harvested in the SWCO Study Area in 2020, 37 percent was processed within the county of harvest, while 30 percent was processed in a different county within the Study Area (table 7). Thirty-three percent was processed outside the SWCO Study Area, but within the TPA, leaving very little to be processed elsewhere. This is in keeping with the definition of the TPA, which is intended to capture all counties where the Study Area's timber is processed.

Dolores County produced the largest timber volume within the Study Area, of which nothing was processed within the county, while 89 percent was processed elsewhere in the Study Area and 11 percent was processed elsewhere within the TPA. By contrast, Montezuma County had close to the same harvest volume but processed 97 percent within the county. Sixty percent of Archuleta County's harvest was processed outside the TPA; however, harvest from this county constituted only 1 percent of the total harvest, bringing the overall share of the Study Area harvest processed outside the TPA to 0.6 percent. These flow patterns are a function of the location of the harvest and the proximity and accessibility of processing facilities.

**Table 7. Timber flow from the Southwest Colorado CFLRP Study Area to the location of processing, 2020 harvest.**

	Processed within county of harvest	Processed elsewhere within Study Area	Processed outside Study Area and inside Timber Processing Area
<b>Study Area harvest</b>			
Archuleta County, CO	15%	0%	25%
Dolores County, CO	0%	89%	11%
Hinsdale County, CO	0%	12%	88%
La Plata County, CO	3%	13%	84%
Mineral County, CO	0%	0%	100%
Montezuma County, CO	97%	0%	3%
Rio Grande County, CO	39%	1%	60%
San Miguel County, CO	0%	0%	100%
<b>Study Area harvest total</b>	<b>37%</b>	<b>30%</b>	<b>33%</b>

Timber processors in the SWCO TPA sourced their logs from both within and outside the Study Area and the TPA (table 8). Sixty-nine percent of timber received by TPA facilities originated within the SWCO TPA (45 percent from within the Study Area and 24 percent from outside the Study Area but still inside the TPA), with the remainder largely being sourced from other Colorado counties.

**Table 8. Origin of timber processed by mills in the Southwest Colorado Timber Processing Area, 2020.**

Origin of timber	Volume (MBF)	Volume (CCF)	Proportion of the total volume of timber received
Study Area	42,699	98,230	45%
TPA outside Study Area	19,709	51,968	24%
Other Colorado counties	30,864	65,828	30%
Other New Mexico counties	1,912	3,863	2%
Montana, Idaho, Wyoming & Utah	130	27	0%
<b>Total</b>	<b>95,314</b>	<b>219,916</b>	<b>100%</b>

### Timber-processing capacity and capability

The purpose of this report is to provide the SWCO CFLRP and its stakeholders with information on 1) The current use of timber by primary wood-processing facilities in the vicinity of the Southwest Colorado CFLRP, and 2) The maximum amount of timber these facilities could economically use in their current configuration. This information is intended to help stakeholders understand the available milling capacity within the TPA.

We are using the term “capacity” to refer to the maximum total volume of timber (excluding pulpwood and fuelwood) that existing timber processors within the TPA could use annually, given firm market demand for products, sufficient raw material, and ordinary downtime for maintenance. Also known as “timber-processing capacity”, it is a measure of mills’ timber *input* capacity and is expressed in MBF Scribner and CCF per year. Input capacity is a useful measure when attempting to express the capacity of multiple types of mills in a common unit of measure. It is estimated from production (output) capacity information provided by facilities. Estimates in this report include the capacity of active facilities as well as idle (inactive) facilities with equipment still in place. Facilities that are permanently closed are not included. This analysis focuses on facilities that exclusively use



timber in round form, which includes sawmills, veneer mills, and facilities processing timber into house logs/log homes, posts, small poles, utility poles, and log furniture. Facilities that use a mix of roundwood and non-roundwood inputs, such as chips, sawdust, shavings, and bark (e.g., pulp mills, wood pellet manufacturers, and biomass energy facilities) are not included in this capacity analysis because the combination of roundwood and non-roundwood inputs can vary widely from year to year, potentially over- or under-estimating capacity and use of roundwood by substantial margins. Likewise, log export yards/facilities are not included because they do not convert timber into a primary product and western public lands (i.e., state and federal) timber cannot, by law, be exported.

The term “capability” refers to the volume of trees of a certain size class (measured as dbh) that existing timber processors can economically process annually. This report uses three dbh classes: <7”, 7 to 9.9”, and ≥10”. Some facilities are designed to operate using only trees of a given size class. Capability at these facilities is readily classified in just one of the size classes (e.g., veneer/ plywood plants typically only use trees ≥10 inches dbh, and post manufacturers primarily use trees <10 inches dbh). Many facilities can and do use timber from a variety of size classes, especially sawmills, which often process trees that are larger than the smallest tree size they are capable of processing due to greater profitability. However, some mills that process larger trees are not capable of processing smaller-diameter timber due to the configuration of their equipment.

“Use” refers to the volume of timber, both in total and by tree dbh class, that facilities are currently processing.

#### *Annual processing capacity and capability*

The estimated timber-processing capacity of facilities in the SWCO TPA was 414,737 CCF or 183,452 MBF (table 9). Of this volume, 73 percent (303,617 CCF or 141,845 MBF) fell within the ≥10” dbh size class, 22 percent (92,579 CCF or 36,699 MBF) fell into the 7-9.9” dbh size class, and the remaining 4 percent (18,541 CCF or 4,909 MBF) fell into the <7” dbh size class. As such, SWCO TPA facilities are mostly able to process larger logs and may not be able to process smaller ones, either due to their equipment or because such processing would have a profit margin too small to be economical.

**Table 9. Annual timber-processing capacity and capability of facilities in the Southwest Colorado CFLRP Timber Processing Area, by dbh size class.**

<b>Tree dbh</b>	Thousand board feet, Scribner (MBF)	Hundred cubic feet (CCF)	Percent
< 7 in.	4,909	18,541	4%
7 - 9.9 in.	36,699	92,579	22%
≥ 10 in.	141,845	303,617	73%
<b>Total capacity</b>	<b>183,452</b>	<b>414,737</b>	<b>100%</b>

Source: BBER mill census for Colorado, 2020.

#### *Processing capacity utilization*

Due to a number of counties within the SWCO TPA containing only one or two processing facilities, counties have been combined into groups to avoid revealing facilities’ proprietary processing information. This approach allows for the reporting of more detailed information than at the state- or TPA-level, while at the same time protecting the confidential information for each facility. As a group, the timber processors in the SWCO TPA were, for a variety of reasons, not operating at full capacity. While the total capacity was 414,737 CCF (183,452 MBF), only 211,001 CCF or 89,747 MBF (51 percent) was being used (table 10). Utilization rates varied from a low of 34 percent in the Park-Saguache county group, to a high of 81 percent in Montezuma County. The prevailing cause

for mills to be operating below capacity is a lack of a steady log supply with limited availability of size-specific logs, especially in the larger size classes.

**Table 10. Timber-processing capacity and consumption within the Southwest Colorado CFLRP Timber Processing Area.**

Timber Processing Area	-----Capacity to process timber-----		-----Timber consumption-----		Most recent utilization
	Thousand board feet, Scribner (MBF)	Hundred cubic feet (CCF)	Thousand board feet, Scribner (MBF)	Hundred cubic feet (CCF)	
Alamosa, Conejos, Rio Grande counties, CO	10,895	31,568	7,522	24,417	77%
Archuleta, La Plata counties, CO	721	1,521	542	1,142	75%
Delta, Montrose counties, CO	114,294	243,371	43,788	93,624	38%
Montezuma County, CO	30,217	75,411	25,520	61,259	81%
Park, Saguache counties, CO	11,250	23,568	3,905	8,119	34%
Colfax, Rio Arriba counties, NM	16,075	39,299	8,470	22,441	57%
<b>Southwest Colorado total</b>	<b>183,452</b>	<b>414,737</b>	<b>89,747</b>	<b>211,001</b>	<b>51%</b>

Source: BBER mill census for Colorado 2020 and New Mexico 2022.

### Unused processing capacity and capability

The distribution of unused capability for each size class mirrored the total capability proportions, with 55 percent of the capability to process timber in the <7" dbh size class going unused, 51 percent of the 7-9.9" dbh size class capability going unused, and 48 percent for the ≥10" dbh size class going unused (table 11).

Of note is the negative unused capability volume for the 7-9.9" dbh size class in the Alamosa-Conejos-Rio Grande county group. In general, negative unused volumes for a particular dbh size class indicates that a facility is processing more timber in that size class than they prefer. FIRP collects information about a facility's maximum, minimum, and preferred log length and small-end log diameter, as well as information about a facility's timber receipts by small-end log diameter and length. This information is used to estimate a facility's timber use and timber-processing capability by dbh size class. The difference between a facility's capability and use is their unused capability. Negative values for unused capability indicate that a facility, or in this case a group of facilities in a county or county group, is processing a higher volume of logs than the facilities would prefer in terms of profitability.

**Table 11. Timber-processing capability and unused capability by size class for the Southwest Colorado CFLRP Timber Processing Area.**

Timber Processing Area	Capability to process timber by dbh size class (CCF)			Unused capability to process timber by dbh size class (CCF)		
	<7" dbh	7-9.9" dbh	≥10" dbh	<7" dbh	7-9.9" dbh	≥10" dbh
Alamosa, Conejos, Rio Grande counties, CO	4,497	7,746	19,325	1,809	(2,119)	7,461
Archuleta, La Plata counties, CO	-	181	1,340	-	69	310
Delta, Montrose counties, CO	4,663	49,041	189,667	3,767	39,249	106,731
Montezuma County, CO	5,593	17,241	52,576	3,580	3,937	6,635
Park, Saguache counties, CO	-	3,865	19,703	-	2,732	12,717
Colfax, Rio Arriba counties, NM	3,788	17,589	17,922	1,061	4,676	11,121
<b>Southwest Colorado total</b>	<b>18,541</b>	<b>95,664</b>	<b>300,532</b>	<b>10,216</b>	<b>48,545</b>	<b>144,975</b>

Source: BBER mill censuses for Colorado 2020 and New Mexico 2022.

## Discussion

As noted above, the national forests intersecting with the SWCO Study Area are the primary sources (70 percent) of the timber processed in the associated TPA, and the San Juan National Forest is the location for the forest

treatments proposed for the area. Given the Forest's difficulty in implementing its fire goals utilizing both prescribed fire and managed wildfire, planning of such treatments are being balanced out with planning of hazardous fuels reduction, which has seen increased feasibility due in part to recent expansion of local forest products industry capacity.

The capacity utilization levels presented in this report indicate that the forest products industry in the SWCO TPA has capacity available to process an increased yield of timber resulting from mechanized fuels reduction (table 11). However, the size and quality of timber available, as well as prevailing market prices and the availability of qualified labor also affect the level of capacity at which primary processors are able to operate and in what size class(es) this capacity utilization is concentrated. Fuels reduction treatments frequently involve the harvesting of smaller-diameter timber, the profitability of which diminishes as tree diameter decreases (Stewart et al. 2004). Harvesting salvage (standing dead) timber can become similarly unprofitable, especially if logs are less than 10" dbh, due to the lower grade recovery for these (Fahey et al. 1986).

While some operators have machinery capable of accommodating the switch from one size class to another, not all processors are able to do so. Making such a shift, with smaller logs yielding lower recovery, would lower profit margins, possibly to the point of a mill becoming unprofitable, especially in a weak lumber market.

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