

# **Capacity and Capability of Mills in the Flathead National Forest Timber-Processing Area**

**Submitted to:**

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## Introduction

This report was prepared as a forest planning support document for the Flathead National Forest as part of Purchase Order No. AG-03R6-P-12-0157 between the USDA Forest Service, Region One and The University of Montana's Bureau of Business and Economic Research (BBER). The report is part of a series of documents intended to be used in conjunction with a broader analysis of the geographic area and forest products facilities impacted by USFS Region 1 timber harvest. The broader region-wide report contains an expanded methods section and further interpretation and will be available from the Bureau of Business and Economic Research at The University of Montana in January 2013.

This individual report for the Flathead National Forest:

1. Examines the harvest of timber from the counties containing non-reserved timberland for the Flathead National Forest;
2. Analyzes the flow of that timber harvest and identifies the location of mills receiving that timber harvest; and
3. Describes the kinds of mills receiving timber, their capacity to process timber, as well as their capability to use timber of various sizes.

In this report, “capacity” refers to the total volume of timber (excluding pulpwood) that existing timber processors could utilize annually, and “capability” refers to the volume of trees of a certain size (diameter at breast height—dbh) class that existing timber processors can efficiently process annually. This analysis focuses on facilities that exclusively use timber in round form; this includes sawmills, plywood and veneer plants, and facilities processing timber into house logs/log homes, utility poles, posts and small poles, log furniture, and cedar products. Because the pulp and paper industry and industrial fuel users generally prefer mill residue as their primary raw material, typically use large volumes of roundwood only when mill residue is in short supply, and because the pulp and paper industry in the Region can draw from a very large area, the potential use of timber for pulpwood and fuelwood is analyzed separately in the broader Region One report.

### **Harvest from Counties Containing Flathead National Forest Non-reserved Timberland**

Flathead National Forest non-reserved timberland is located in three Montana counties: Flathead, Lake, and Missoula. The total harvest from all lands in these three counties was 43.9 million cubic feet (MMCF) in 2009 (McIver and others, in preparation). Fifteen percent (6.6 MMCF) of the timber harvest in this three-county area originated from the Flathead National Forest. Most (80 percent) of the timber harvested from these counties consisted of green (live) trees. The species composition of the harvested volume in this three-county area was: Douglas-fir approximately 32 percent, lodgepole pine 27 percent, ponderosa pine 14 percent, and western larch and spruce accounted for 10 and 9 percent, respectively. True firs accounted for about 7 percent of the harvest, and western redcedar, western hemlock, and western white pine combined accounted for approximately 1 percent. Sawmills and veneer/plywood plants received about 71 percent of the timber harvested from these counties. House logs, posts and small poles, and other mills received less than 2 percent of the timber harvest volume. Pulp and paper mills utilized 28 percent of the 2009 harvest from the three-county region.

The 2011 harvest in the three-county area was estimated to be approximately 51.4 MMCF. Given the mill closures that have occurred in the region since 2009, the pulpwood component was close to the historical average of 5 percent of the total harvest in 2011. The Flathead National Forest harvest in the three-county area was estimated to be approximately 10 percent of the total harvest by all ownerships.

### **Timber-processing area**

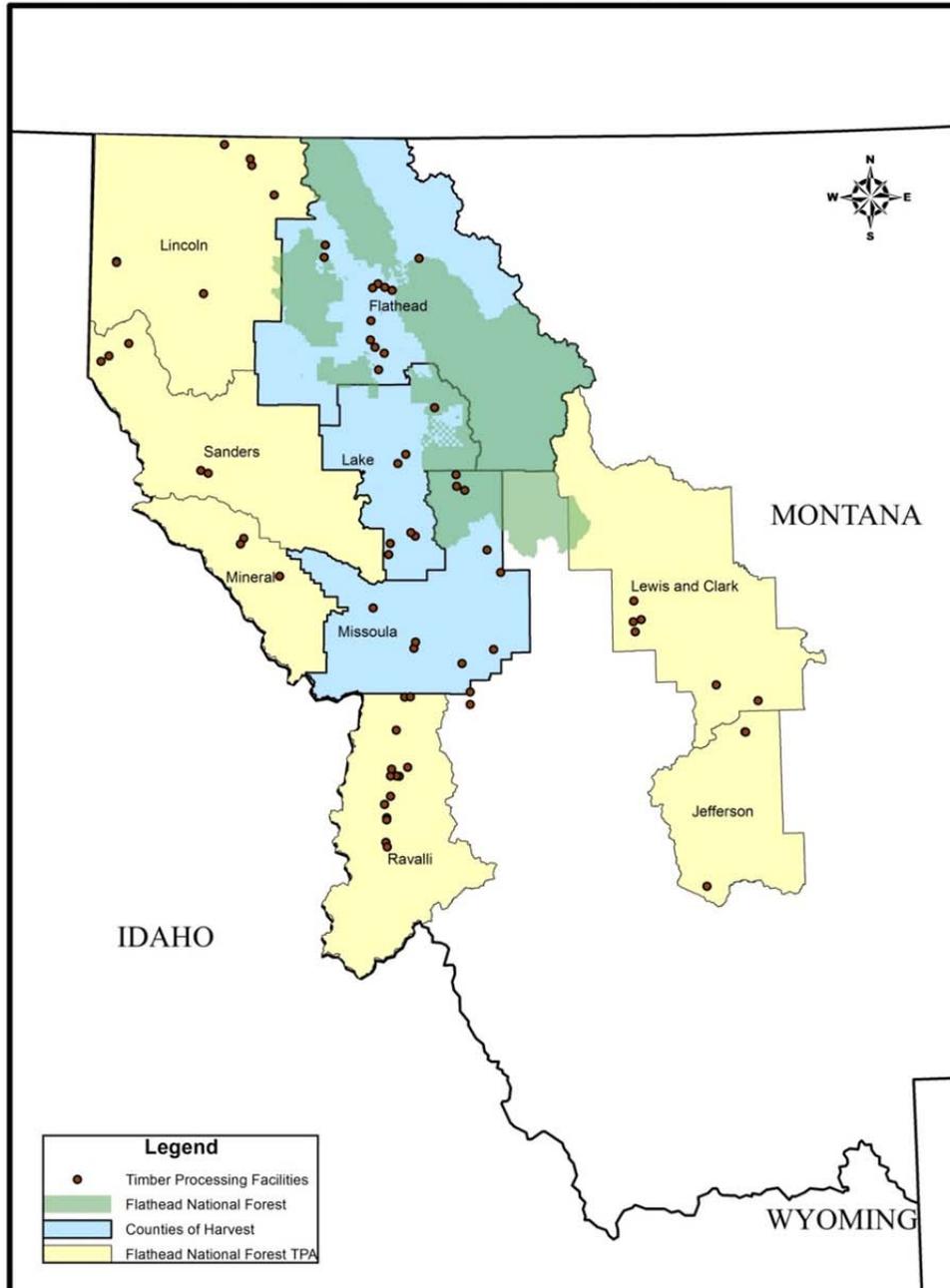
The following steps were taken to determine the timber-processing area for the Flathead National Forest:

1. Counties containing Flathead National Forest non-reserved timberlands were identified.
2. Using BBER databases, timber harvest and flow from all ownerships within the above counties were analyzed.
3. The three counties containing Flathead National Forest non-reserved timberland were automatically included in the TPA.
4. Counties contiguous to the counties identified in step 1 that received timber from those counties were included unless the volume was a very small proportion of the total timber receipts in that county. If historic (2004 and 1998) timber flow

data indicated a substantial flow of timber into a contiguous county, the county would be included in the TPA even if recent (2009) flows were relatively small (see Spoelma and others 2008 and Keegan and others 2001).

5. Finally, all other counties receiving timber from the three counties identified in step 1 were included if the volume represented more than 10% of the total timber received in that county.

Figure 1. Flathead National Forest Timber Processing Area



Map created by Chelsea P. McIver, Bureau of Business and Economic Research.  
Data courtesy of ESRI, Inc.; Montana Natural Resource Information System (NRIS); Bureau of Business and Economic Research.  
Map created on July 25, 2012.

The Flathead National Forest Timber Processing Area (TPA) was defined by the BBER as the nine-county area including Flathead, Jefferson, Lake, Lewis and Clark, Lincoln, Mineral, Missoula, Ravalli, and Sanders Counties in Montana (Figure 1).

Within the Flathead National Forest TPA there were 78 timber processing facilities operating as of 2011: 31 sawmills, 23 log home manufacturers, 13 log furniture manufacturers, 8 post and small pole plants, two veneer and plywood facilities, and one cedar products manufacturer (Table 1).

<b>Table 1 - Timber processing facilities in the 2011 Flathead National Forest TPA, selected years.</b>		
<b>Type</b>	<b>2004</b>	<b>2011</b>
Sawmills	36	31
Log home	55	23
Post and Pole	16	8
Log Furniture	24	13
Plywood	3	2
Cedar Products	1	1
<b>Total</b>	<b>135</b>	<b>78</b>
Sources: Spoelma and others 2008; McIver and others, In preparation)		

### **Timber Flow**

Of the 43.9 MMCF of timber harvested in the three-county area containing Flathead National Forest non-reserved timberland, 68 percent was processed within the three counties of harvest. Furthermore, 94 percent was processed within the TPA and the remaining 6 percent was processed outside the TPA. Flathead and Missoula counties processed the largest proportion of the harvest originating within their borders, accounting for 87 and 54 percent, respectively (Table 2). All of the harvest from Flathead County was processed within the nine-county Flathead TPA, while only 9 percent of the harvest from Lake County was processed within the county's own borders and 26 percent was processed outside the TPA (McIver and others, in preparation).

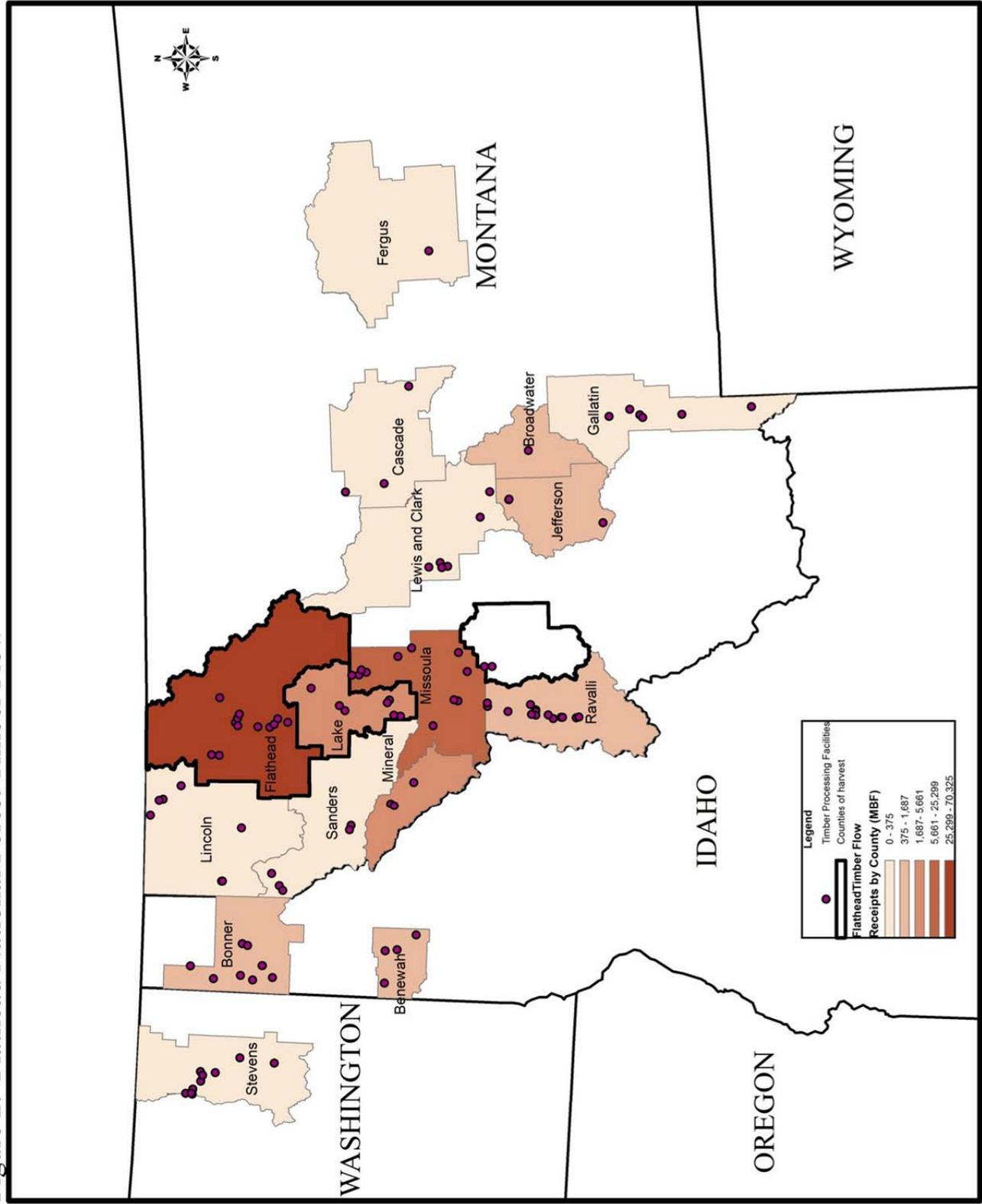
**Table 2** - Timber flow from the Flathead National Forest three-county area to county of processing facility (excluding pulpwood), 2009.

<b>County of Harvest</b>	<b>Processed within the county of harvest</b>	<b>Processed within the TPA</b>	<b>Processed outside the TPA</b>
<i>-----percentage of harvest by county-----</i>			
Flathead	87%	100%	0%
Lake	9%	74%	26%
Missoula	54%	92%	8%

Source: McIver and others, In preparation.

An additional eight counties in Montana, two counties in Idaho, one county in Washington, and one county in Oregon received 6 percent (1.6 MMCF) of the timber harvest from the three counties containing Flathead National Forest non-reserved timberland (Figure 2). Broadwater, Cascade, Fergus, Gallatin, Jefferson Lincoln, Park, and Powell counties in Montana, Benewah and Bonner counties in Idaho, Stevens County in Washington and Umatilla County in Oregon did receive timber from the Flathead three-county area, but were excluded from the Flathead TPA because the volumes received from the three county harvest area accounted for less than 10 percent of total mill receipts in each of the receiving counties.

Figure 2. Flathead National Forest Timber Flow



Map created by Chelsea P. McIver, Bureau of Business and Economic Research.  
Data courtesy of ESRI, Inc.; Montana Natural Resource Information System (NRIS); Bureau of Business and Economic Research.  
Map created July 25, 2012.

### Current conditions and capacity

The tables in this section are labeled 2011 and represent 2009 timber-flow and timber-use data adjusted to account for 2011 timber harvest and lumber and plywood production levels, as well as mill closures and openings during 2010 and 2011.

Capacity to process timber in the Flathead National Forest TPA during 2011 was 112 million cubic feet (MMCF), with mills utilizing approximately 56 MMCF or about 50 percent of capacity (Table 3). Nearly 89 percent (49.9 MMCF) of the volume processed in the TPA was composed of trees with diameter at breast height (dbh)  $\geq 10''$ . Just over 7 percent (4.1 MMCF) of the volume processed came from trees 7.0 - 9.9'' dbh, while approximately 4 percent (2.2 MMCF) of processed volume came from trees  $< 7''$  dbh (Table 3).

**Table 3. Annual Volume of Timber Processed by Tree Size Class (Excluding Pulpwood) for the Flathead National Forest Timber Processing Area, 2011.**

Thousand Cubic Feet of Timber		Thousand Board Feet Scribner of Timber	
Tree dbh	Volume Used	Tree dbh	Volume Used
< 7 in.	2,196	< 7 in.	2,196
7 - 9.9 in.	4,106	7 - 9.9 in.	15,768
10+ in.	49,946	10+ in.	236,154
Total	56,248	Total	254,118

Most facilities are designed to operate using trees of a given size class (e.g., veneer/plywood plants typically use trees  $\geq 10''$  dbh, and post manufacturers use trees  $< 7''$  dbh). Capacity at these facilities was readily classified as being capable of processing timber of just one of the size classes. This was true for some sawmills, but sawmills vary greatly in equipment, product output, and ability to process timber of various sizes.

Mills often process trees that are larger than the smallest tree sizes they are capable of processing. In other words, most mills capable of efficiently processing trees 7 – 9.9'' dbh are also capable of and prefer processing trees  $\geq 10''$  dbh; thus, these mills tend to process substantially more of the larger trees. However, some mills that process larger trees are not capable of processing smaller-diameter trees. For this reason, this report presents capability to process trees  $\geq 10''$  dbh as the proportion of total capacity *not* capable of efficiently using trees  $< 10''$  dbh. Whereas, capability to process trees  $< 7''$  dbh and 7 – 9.9'' dbh are presented as maximum volumes of trees of these size classes that can be processed efficiently.

About 59 percent (66.5 MMCF) of the 112 MMCF of existing capacity in the Flathead National Forest TPA is not capable of efficiently utilizing trees < 10" dbh, and nearly 60 percent of the capacity capable of utilizing trees < 10" dbh is in the 7 - 9.9" dbh class (Table 4).

Thousand Cubic Feet of Timber		Thousand Board Feet Scribner of Timber	
Tree dbh	Capability	Tree dbh	Capability
< 7 in.	18,251	< 7 in.	18,251
7 - 9.9 in.	27,175	7 - 9.9 in.	104,351
10+ in.	66,468	10+ in.	371,003
Total Capacity	111,893	Total Capacity	493,606

\* Note: Capability in < 7 and 7 - 9.9 in. classes is maximum volume capable of being used efficiently; capability in 10+ in. class is portion of total capacity NOT capable of efficiently using trees with dbh < 10 in.

A substantial amount of the capacity capable of utilizing smaller diameter trees is being used to process larger trees or going unused. About 12 percent of capacity in the < 7" dbh category is currently utilized to process trees < 7" dbh, and slightly more than 15 percent of capacity in the 7 - 9.9" dbh category is being used to process trees 7 - 9.9" dbh. More than 7.6 MMCF of capacity capable of using trees 7 - 9.9" dbh is used annually to process trees  $\geq$  10" dbh. Recent (2007-2011) poor market conditions for lumber have reduced mill demand for smaller diameter logs used to make studs. When markets are poor it becomes more difficult to profitably produce lumber from small and low quality logs. The price of stud grade lumber—which is predominantly made from small logs—fell by a much higher percentage during the recent recession than many other dimensions and board and shop lumber grades (Random Lengths 2010). This reduced the profitability of sawing lower grades of lumber from small and lower quality logs. As lumber markets recover, increased capacity utilization can be expected across all the size classes.

## Future Outlook

The period of 2007 – 2011 represents the worst operating environment experienced by the North American and Montana forest products industry since the Great Depression. It involved a two-year recession from 2007 – 2009, the related financial crisis, and a housing collapse with the lowest levels of new home construction since the Second World War (Keegan et al. 2012). Very low prices for lumber and other wood products have accompanied this broad economic downturn.

As of August 2012, there has been only a small increase in U.S. housing construction. Modest upticks are expected in domestic lumber markets during the remainder of 2012 and 2013, with substantial improvements not likely until 2014 or beyond, if U.S. home building recovers and global demand continues to increase.

Given the continued difficult conditions, additional mill closures are possible. However, with slightly over half of capacity utilized in recent years—versus a historic level of over 80 percent during good markets—the industry would be expected to process substantially more timber when markets improve, provided adequate timber supply is available.

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