

Employment Impacts of Timber Harvesting and Processing in the United States

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Abstract:

In an effort to help quantify the economic impacts of forest management, information from public databases was used to estimate direct forest industry employment from the harvesting and processing timber. Employment estimates per unit of timber harvested are referred to as direct response coefficients (DRCs). This research provides employment DRCs for 16 forest industry sectors and 11 regions within the United States. Employment DRCs are expressed as number of workers per million cubic feet (MMCF) of timber harvested and processed on an annual basis.

For the in-woods sector of forestry and logging, the highest DRCs were found in the Four Corners States, followed by the Northeast States. Alaska had the highest DRCs for softwood sawmills, followed by the Four Corners States, while the highest DRCs for hardwood sawmills were found in the Southeast regions and North Central States. House log and log furniture plants were found to have high average DRCs throughout the nation, though widely varying from one facility to the next.

Methods:

State level timber harvest data from the USFS Forest Inventory and Analysis Timber Products Output (FIA-TPO) program were summarized by product type and major species group (i.e., hardwood vs. softwood).

State level employment data from three federal data sets (see Data Sources below) were organized by industry sector (i.e., NAICS code). Only private sector employment was included, so federal and state timber management and regulatory jobs are not included. Also, transporting timber to mills is classified as trucking, which was not included in this analysis.

Employment DRCs were calculated for individual states then combined into geographic regions with similar industry structure. Regional DRCs were volume-weighted by each state's proportion of harvest volume by timber product type. Kansas, Hawaii, Nebraska, and North Dakota were not included in the analysis due to a small number of mills and limited harvest and employment data.

Employment DRC results are shown below in Table 1.

Example & Discussion:

To illustrate the use of the DRCs, the following example is provided. An annual timber sale program of 10 MMCF is offered by a landowner with property in Oregon and Washington with the expectation that 75 percent of the timber will go to sawmills, 20 percent will be processed by the pulp and paper industry, and 5 percent by utility pole plants. All of the timber is assumed to be softwood. The expected annual employment from harvesting and processing that timber is as follows:

- Harvesting the 10 MMCF of timber will employ 110 workers in forestry and logging.
- The processing of 7.5 MMCF of logs into lumber at Oregon and Washington softwood sawmills will employ 90 more workers.
- The use of the sawmill residue at other facilities will employ an additional 37.5 workers.
- The processing of 2 MMCF of logs at Oregon and Washington pulp and paper mills will employ 18 more workers.
- The processing of 0.5 MMCF of logs at Oregon and Washington utility pole plants will employ 7.5 more workers.
- The use of the utility pole residue at other facilities will employ 1 additional worker.
- Thus, the total direct private sector employment from harvesting and processing 10 MMCF of logs in Oregon and Washington based on the assumed product use would be 264 workers for a year.

Table 1—Employment Direct Response Coefficients by Industry Sector and State Group
(number of jobs per MMCF of timber harvested, excluding fuelwood)

Industry Sector	Alaska	California & Nevada	Oregon & Washington	Idaho & Montana	Four Corners States	Woming & South Dakota	North Central States	West Southeast States	East Southeast States	Hardwood States	Northeast States	
Forestry & logging	14	18	11	12	32	14	15	9	8	18	22	
Softwood sawmills	20	15	12	14	17	12	14	9	11	15	12	
Hardwood sawmills	a	a	a	a	a	a	28	30	28	26	25	
Residue (sawmills)	2	3	5	5	6	4	4	4	4	4	4	
Softwood plywood/veneer	a	a	31	32	a	a	a	17	22	a	a	
Hardwood plywood/veneer	a	a	a	a	a	a	80	80	80	80	80	
Residue (plywood/veneer)	a	a	4	4	a	a	4	4	4	4	4	
OSB and other structural composite panels	a	a	a	a	a	a	8	8	8	8	8	
Roundwood for pulp and paper	a	9	9	9	9	a	9	9	9	9	9	
Energy - large	a	2	2	2	2	a	2	2	2	2	2	
Energy - small	10	10	10	10	10	10	10	10	10	10	10	
Other mills												
Post and pole	a	15	15	14	15	15	a	30	30	a	a	
Utility pole	a	14	14	14	14	14	a	11	11	a	a	
House log / log home	100	100	100	100	100	100	75	75	75	75	75	
Log furniture	125	125	125	125	125	125	125	125	125	125	125	
Residue (other mills)	2	2	2	2	2	2	2	2	2	2	2	
States in each group	Alaska	California Nevada	Oregon Washington	Idaho Montana	Arizona Colorado New Mexico Utah	Wyoming South Dakota	Michigan Minnesota Wisconsin	Arkansas Louisiana Oklahoma Texas	Alabama Florida Georgia Mississippi North Carolina South Carolina Virginia	Illinois Indiana Iowa Kentucky Maryland Missouri Ohio Pennsylvania Tennessee West Virginia	Connecticut Delaware Maine Massachusetts New Hampshire New Jersey New York Rhode Island Vermont	

^aValue not reported either due to lack of industry in the region, or to maintain confidentiality of existing operations.

Information on annual wages per worker by sector and region can then be used in conjunction with the employment DRCs to estimate the impact of timber harvest on worker income.

There is considerable variability in the DRCs by industry sector and by region. Factors influencing the differences by sector include the size and degree of manufacturing in each sector or facility and the capital intensiveness of various manufacturing processes.

The lowest employment DRCs in the manufacturing sectors are found at highly capital intensive facilities such as pulp and paper mills, OSB plants, and large wood energy facilities. These facilities also have low variability in DRCs among regions. Large softwood sawmills are also comparatively capital intensive and make relatively homogenous products compared to hardwood sawmills.

The hardwood sawmill and plywood industries, log home industry, and log furniture industry have higher employment DRCs because they use relatively low capital intensive (e.g., smaller) facilities, and they often produce high value "custom" or "hand-crafted" products which involve a higher degree of processing.

Regional differences in forestry and logging DRCs are influenced by several factors, including terrain, timber size and type, and seasonal factors related to weather. The Southeast, with a large industry, long operating season, relatively gentle terrain, and fairly homogenous resource of young-growth (pine) plantation timber makes considerable use of mechanized harvesting and has the lowest employment DRCs in forestry and logging. In contrast, Western logging can often involve steeper terrain, a shorter operating season, more manual felling, and more harvesting in natural and mixed species stands.

Funding provided by:
 USDA, Forest Service,
 Ecosystem Management
 Coordination, Washington, DC
 Agreement #12-CS-11132427-325



Data Sources:
 US Dept. of Agriculture, Forest Service, FIA Program, Timber Products Output
 US Dept. of Commerce, Bureau of Economic Analysis, Regional Economic Information System
 US Dept. of Commerce, Census Bureau, County Business Patterns
 US Dept. of Labor, Bureau of Labor Statistics, Quarterly Census of Employment and Wages

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