

Forest Products Industries' Economic Contributions: Illinois

June 2020

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Foreword

Illinois's forests offer remarkable benefits to our residents. While the role trees play in providing materials for building homes and wood products are readily apparent, forests also protect the soil and preserve the quality of our air and water. The relationship between our forests and the preservation of biological diversity or presence of animals and birds is equally important. Illinois forests facilitate and play a vital role in a wide variety of outdoor recreation and aesthetic pursuits throughout the state. These interactions of the forests of Illinois and other natural resources range from quite simple to extremely complex and require ongoing scientific efforts. Most Illinois forests can provide these commodity and conservation roles, functions, and outputs with care and management.

Forests occupy about 14 percent of the state's surface area. Illinois's forests are home to 61 percent of the flora native to the state and 75 percent of its wildlife habitat. Forestry, the science and skill of analyzing, nurturing, tending and protecting forests, is actively practiced by degreed foresters within Illinois in state, private, federal, academic, and other organizations or businesses. Forestry-related businesses and markets for forest products are instrumental in the forester's ability to properly manage the forests for the non-commodity benefits they provide.

The historic, pre-settlement landcover in Illinois was once over 40 percent forest! These forests included dense mesic forests, open forests, and savannas and covered about 14 million acres. Settlement, farming, and land development eventually reduced Illinois's forests to a low of less than 3 million acres. Today, Illinois's forests have expanded and regrown to over 5 million acres, all of which are critical to people's future health and well-being and essential to Illinois's natural, biological, and physical environments. Though forests in Illinois will never attain the acreage they once held, the high-quality logs and other wood and forest products and the economic benefits and jobs sustained by these forest products have ever been more valuable.

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Acknowledgements

This report was produced as part of a 20-state project supported by a U.S. Department of Agriculture Forest Service 2017 Landscape Scale Restoration Grant, administered by the Michigan Department of Natural Resources, Forest Resources Division on behalf of the Northeast-Midwest State Foresters Alliance Forest Markets & Utilization Committee. Paul Deizman of the Illinois Department of Natural Resources, Division of Forest Resources contributed extensively to the Illinois report, and we thank him for his contributions.

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Executive Summary

This report assesses broad forest conditions and economic contributions of forest products industries in Illinois. It is one of 20 coordinated and comparable state reports in the northeastern and midwestern United States that provides an improved assessment of forests and the economies they support. Forest data come from the U.S. Forest Service’s Forest Inventory and Analysis website, and economic data come from the 2017 Impact Analysis for Planning (IMPLAN), a commercially available economic input-output (IO) model.

Illinois boasts 5.0 million acres of forest land that cover 14.2 percent of its land base, with most of this forest land able to produce commercial timber. The majority, 83.1 percent, is privately owned, while state and local governments own 9.3 percent, and the federal government owns 7.6 percent.

Forest Industries

This report presents seven forest products industries, which are based on 32 economic sectors in IMPLAN, 30 of which are present in Illinois:

- Forestry
- Logging
- Primary solid wood products
- Secondary solid wood products
- Wood furniture
- Pulp, paper, and paperboard mills
- Secondary paperboard and other paper products

In 2017, Illinois’s forest products industries provided direct employment to 38,554 people, leading to \$12.9 billion in output. That same year, labor income was \$2.8 billion and value-added was \$3.6 billion. In total contributions, these industries supported 90,102 jobs, \$6.0 billion in labor income, \$9.0 billion in value-added, and \$21.9 billion in output.

Among the top sectors (excluding forest products sectors) impacted by forest products industries were wholesale trade, restaurants, management of companies and enterprises, trucking, and real estate. This group of sectors reflects spending by forest products companies, their suppliers, and individuals.

Leading Forest Products Industry Groups

Among the seven industry groups, the leading industries’ rank in terms of direct jobs, value-added, and direct output varied by chosen measure:

- Secondary paperboard and other paper products had the highest number of direct jobs (17,956), value-added (\$2.0 billion), and output (\$8.2 billion).
- Wood furniture had the second-highest number of direct jobs (10,808), value-added (\$915.1 million), and output (\$2.1 billion).
- Secondary solid wood products had the third-highest direct employment (6,304), value-added (\$376.3 million), and output (\$1.1 billion).

Leading Individual Forest Products Sectors

Among the 30 forest products sectors present in Illinois, the top four, by measure in order from highest to fourth highest of direct contributions, were:

- Employment—Paperboard container manufacturing; paper bag and coated and treated paper manufacturing; wood kitchen cabinet and countertop manufacturing; and showcase, partition, shelving, and locker manufacturing were the top four sectors and had a combined total of 22,160 direct jobs, which was 57.5 percent of direct employment.
- Labor income—Paperboard container manufacturing; paper bag and coated and treated paper manufacturing; showcase, partition, shelving, and locker manufacturing; and wood kitchen cabinet and countertop manufacturing had the highest labor income, totaling \$1.7 billion, which was 63.4 percent of direct labor income.
- Value-added—Paperboard container manufacturing; paper bag and coated and treated paper manufacturing; showcase, partition, shelving, and locker manufacturing; and wood kitchen cabinet and countertop manufacturing had the highest value-added, totaling \$2.3 billion, which was 62.0 percent of direct value-added.
- Output—Paperboard container manufacturing; paper bag and coated and treated paper manufacturing; showcase, partition, shelving, and locker manufacturing; and wood kitchen cabinet and countertop manufacturing were the top four sectors in output, totaling \$8.6 billion, which was 67.0 percent of total direct output.

Illinois's Forest Products Industries Compared to Other Illinois Industries

The forest products industries provide more direct labor income, value-added, and output than commercial fishing, hunting, and trapping and mining and oil and gas production. Overall, forest products industries accounted for 7.6 percent of the nonfood manufacturing jobs in Illinois. In 2017, 6.3 percent of Illinois's 592,190 direct manufacturing jobs were in the forest products industries, one out of every 16 manufacturing jobs.

Illinois's Forest Products Industries Compared to Those of Indiana, Iowa, and Missouri

Forest products industries in four midwestern states (Illinois, Indiana, Iowa, and Missouri) employed 132,181 workers and accounted for \$37.7 billion in direct output. Indiana's forest products economy was the largest among these states, followed by that of Illinois.

Glossary

The following technical terms are used throughout this report when discussing forestry and economic contributions.

Forestry Terms

Average annual harvest removals: The average annual merchantable volume of growing-stock trees that were live at the time of the previous inventory and were either cut and removed by direct human activity related to harvesting or died as a result of silvicultural or land-clearing activity by the time of the current inventory.

Average annual mortality: The average annual merchantable volume of growing-stock trees that were live at the time of the previous inventory and are dead in the current inventory.

Average annual net growth: The average annual change in merchantable volume of growing-stock trees, after deducting mortality volume, between inventories.

Forest land: Land that is at least 10 percent stocked by trees of any size, including land that formerly had such tree cover and that will be naturally or artificially regenerated. Forest land includes transition zones, such as areas between heavily forested and nonforested lands that have at least 10 percent canopy cover with live tally trees, or recently had at least 10 percent canopy cover by live tally trees based on the presence of stumps, snags or other evidence, and forest areas adjacent to urban and built-up lands, including pinyon-juniper and chaparral areas in the western U.S. and afforested areas. The minimum area for classification of forest land is one acre and 120 feet wide measured stem-to-stem from the outermost edge. Unimproved roads and trails, streams, and clearings in forest areas are classified as forest land if less than 120 feet wide.

Growing stock: Live trees of commercial species that meet minimum merchantability standards and only includes trees at least 5 inches in diameter at breast height. In general, these trees have at least one solid eight-foot section, are reasonably free of form defect on the merchantable bole, and at least 34 percent or more of the volume is merchantable. Excludes rough or rotten cull trees.

Timberland: A subset of forest land that produces or can produce crops of industrial wood and not withdrawn from timber utilization by statute or administrative regulation. (Note: Areas qualifying as timberland can produce at least 20 cubic feet per acre per year of industrial wood in natural stands. Currently inaccessible and inoperable areas are included.)

Economic Contribution Terms

Direct effects/contributions: The economic activities (e.g., output, employment, labor income, and value-added) associated with an industry or sector in the study area. These can describe the current economic sectors or changes to those sectors.

Employment: The number of full- and part-time jobs associated with an industry.

Indirect effects/contributions: The impact of local industries purchasing goods and services from other industries, leading to others' outputs, employment, and labor income. This report uses "indirect effects" to refer to the combination of indirect and induced effects.

Induced effects/contributions: The impact of labor income (employee compensation and proprietor income) via goods and services purchased due to the direct and indirect spending by industries. For this report, induced effects are included with indirect effects and referred to as indirect effects.

Labor income: The dollar total of employee compensation and proprietor income; the latter is associated with self-employed individuals.

Output: The dollar measure of production within an area; it is also viewed as sales.

Social Accounting Matrix (SAM) multipliers: These multipliers are derived by dividing the sum of direct, indirect, and induced effects by the direct effects. The social accounts include payments made between households, households and government, and more. These are available for output, employment, labor income, and value-added and are used to assess effects of changes in industry activity (i.e., "ripple effects").

Total effects/contributions: The sum of direct, indirect, and induced effects.

Value-added:(also known as gross state product, or GSP): The sum of labor income, other property income (e.g., rents and profits), and indirect business taxes (e.g., excise and sales taxes). It is the difference between an industry's total output and the cost of its intermediate inputs. The sum of value-added for all economic sectors within the region equals the total GSP.

Introduction

Forest products industries are an integral component of Illinois's economy. They provide jobs, raw materials, and finished goods that generate additional economic activity throughout the state, region, and nation. This report compares the contributions of Illinois's forest products industries with those of adjacent states. It is one of 20 reports in the Northeast and Midwestern area of the United States that broadly assesses forests and their economic contributions. The interactions of these 20 states are covered in a regional report. In total, these documents provide a consistent reporting format, compiled using identical methods, across the northeastern and midwestern United States. Previous state-level reports in this area were not comparable because they used different methods and data.

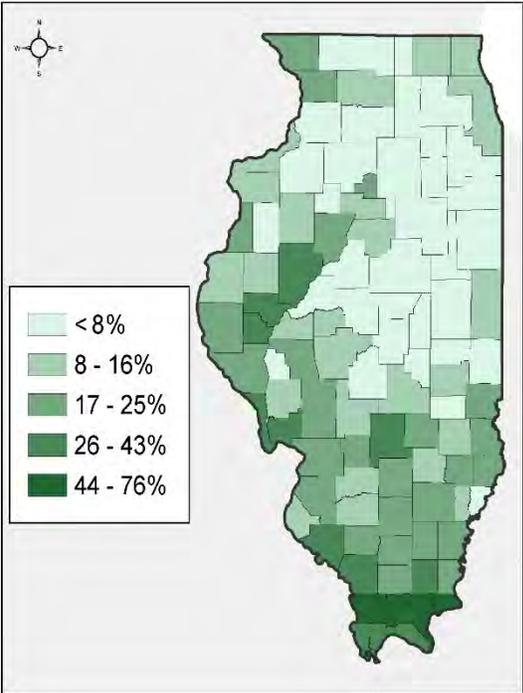
To help quantify these relationships and consistently document the industries' contributions, the Forest Markets & Utilization Committee of the Northeast—Midwest State Foresters Alliance secured federal grant funds to conduct an analysis of 20 midwestern- and northeastern-area states as well as Nebraska. As part of this work, the same project team that completed the individual state reports—comprising members of the Michigan Department of Natural Resources, Public Sector Consultants, Michigan State University forestry economics professor emeritus Larry Leefers, and state forestry experts—published a 20-state report summarizing the economic contributions of forest products industries at a regional level. The U.S. Forest Service funded this work through a 2017 Landscape Scale Restoration grant.

Much of the data used in this report were derived from the U.S. Forest Service Forest Inventory and Analysis database and from IMPLAN, a widely used economic modeling system. These data and related information are presented in four major sections: Forest Resources of Illinois, Forest Products Industries, Economic Contributions of Illinois's Forest Products Industries, and Summary. Due to rounding, some figures in the following tables may not sum to the exact total indicated. The appendices present the economic methods and detailed economic sector data used for this report.

Forest Resources of Illinois

Illinois is rich in forest resources. Exhibit 1 shows the percent of forest land coverage by county throughout the state.

Exhibit 1. Illinois Forest Land by County, 2017



Source: U.S. Forest Service Forest Inventory and Analysis Program

Illinois now has the greatest area of forest land since the 1930s, with over 14 percent of the state in forest (Exhibit 2). Timberland is the largest component of forest land, accounting for 4.7 million acres.

Exhibit 2. Illinois Land Area by Land Use Type, 2017 (U.S. Forest Service)

Land Use Type	Acres	Percentage
Forest land	5,011,150	14.2%
Nonforest land	30,288,287	85.8%
Total	35,299,437	100.0%

Most Illinois’ forest land—83.1 percent—is privately owned, while state and local government account for 9.3 percent and federal government owns 7.6 percent (Exhibit 3). Landowners pursue diverse goals. Private landowners have wide latitude in how they treat their lands—some have a hands-off approach, while others pursue active management. There are several state and federal programs designed to encourage the active management of private forest lands. State forests, private forests, and national forests are actively managed in many areas, while resource protection is emphasized in others. Active timber management provides the feedstock for Illinois’ forest products industries.

Exhibit 3. Forest Land by Ownership Group in Illinois (2017)

Ownership Group	Acres	Percentage
National forest	291,641	5.8%
Other federal	90,103	1.8%
State and local governments	464,645	9.3%
Private	4,164,760	83.1%
Total	5,011,150	100.0%

Trees are common throughout the state. They are in our forests, along our rivers, and in our yards. There are an estimated 2.1 billion trees in Illinois (Crocker 2018).

Illinois’s major forest types include oak/hickory and elm/ash/cottonwood (Exhibit 4). Illinois is internationally known for its high-quality oak and walnut timber, which is prized for furniture manufacturing and use in quality durable goods. Illinois’s diverse timber species support a variety of forest products industries, including office and institutional furniture from soft maple, industrial timber from bottomland hardwoods, hardwood-grade lumber from fine hardwoods, and a variety of other hardwood industrial lumber and wood products.

Exhibit 4. Forest Land Area by Forest Type Group in Illinois (2017)

Forest Type Group	Acres	Percentage
Oak/hickory	3,413,770	68.1%
Elm/ash/cottonwood	1,227,507	24.5%
Maple/beech/birch	112,265	2.2%
Oak/pine	68,632	1.4%
Oak/gum/cypress	58,686	1.2%
Other	130,292	2.6%
Total	5,011,150	100.0%

The estimated volume of standing timber suitable for forest products was about 7.7 billion cubic feet, or about 97 million standard cords¹ (Exhibit 5). Average annual net growth exceeded annual harvest removals by a ratio of about 3.6 to 1. That is, for every cubic foot of harvesting that took place, 3.6 cubic feet of timber grew, after accounting for mortality. Average annual harvest removals in 2017 of growing stock were about 40.7 million cubic feet—roughly 0.5 percent of standing volume.

Exhibit 5. Characteristics of Growing Stock in Illinois, 2017 (million cubic feet)

Measure	Total	National Forest	Other Federal	State and Local Government	Private
Net volume	7,676.9	606.2	185.9	770.6	6,114.2
Average annual net growth	146.5	3.8	3.9	14.6	124.1
Average annual harvest removals	40.7	1.0	0.0	0.6	39.1
Average annual mortality	115.6	10.0	4.0	10.0	91.6

Note: Net volume is merchantable volume, in cubic feet, of growing-stock trees for timber species (trees where diameter is measured at breast height) from a 1-foot stump to a minimum 4-inch top diameter, or to where the central stem breaks into limbs all of which are less than 4.0 inches in diameter. Volume loss due to rotten, missing, and form cull has been deducted. Growing stock is defined as live trees of commercial species that meet minimum merchantability standards and only includes trees at least 5 inches in diameter at breast height. Net growth is the average annual change (gross growth minus mortality) in merchantable volume, in cubic feet, of growing-stock trees on forestland. Harvest removals are the average annual merchantable volume, in cubic feet, of growing-stock trees at the time of removal from forest land. Annual mortality is the average annual merchantable volume, in cubic feet, of growing-stock trees at the time of mortality on forest land.

Forest Products Industries

Contribution analysis focuses on industries' role in an economy. The first step is often defining the region (e.g., a state). One of the next steps is to define exactly which economic sectors comprise the focus industries. To analyze the contributions of the forest industries, representatives from the U.S. Forest Service's northeastern and midwestern states and Nebraska selected 32 sectors by consensus for inclusion in the analysis. A description of the methods and data is presented in Appendix A. To concisely describe and communicate the economic contribution of the forest products industries, these 32 sectors were aggregated into seven broad groups (Appendix B):

- Forestry
- Logging
- Primary solid wood products

¹ A standard cord is a unit of measurement for pulpwood or sawlogs, generally equivalent to a stack of wood measuring four feet wide by four feet tall by eight feet long. A stacked cord of wood typically contains about 79 cubic feet of solid wood, excluding air space.

- Secondary solid wood products
- Wood furniture
- Pulp, paper, and paperboard mills
- Secondary paperboard and other paper products

In total, these sectors cover forest-specific manufacturing activities, including the conversion of trees into primary products and the manufacture of products used by other sectors and households. Primary industries (e.g., sawmills, reconstituted wood products [such as oriented strand board], and power plants) use wood directly from the forest, including roundwood, chips, or similar forms. Secondary industries (e.g., trusses and furniture) use one or more primary forest products (e.g., lumber and paperboard) in their manufacturing processes. Value is added as the timber is processed through primary and secondary manufacturers. Several sectors included wood and non-wood products (e.g., institutional furniture manufacturing). Therefore, output and other measures were reduced to better reflect the wood-only component by using published government data or surveys (Gibson, Leefers, and Poudel 2020).

This report used IMPLAN to estimate economic contributions of the forest products industries. IMPLAN is a widely used input-output model that comprises economic data and software. IO models characterize financial linkages among and between sectors, households, and institutions, and can be constructed for different geographic areas. Within these models, various sectors have production functions that show the value of inputs used in production of outputs or commodities. Illinois’s economy was represented by 516 sectors in 2017, the most recent year available for IMPLAN data at the time of the analysis. These sectors are based on the North American Industrial Classification System (NAICS).

IMPLAN models can be constructed for different geographic areas. State data were used in this report, but given IMPLAN’s structure, substate and multistate analyses can be developed.

Economic Contributions of Illinois’s Forest Products Industries

This section of the report includes four major subsections: Economic Contributions Defined, Economic Contribution Results, Importance of the Forest Products Industries in Context, and Supplemental Economic Contribution Information.

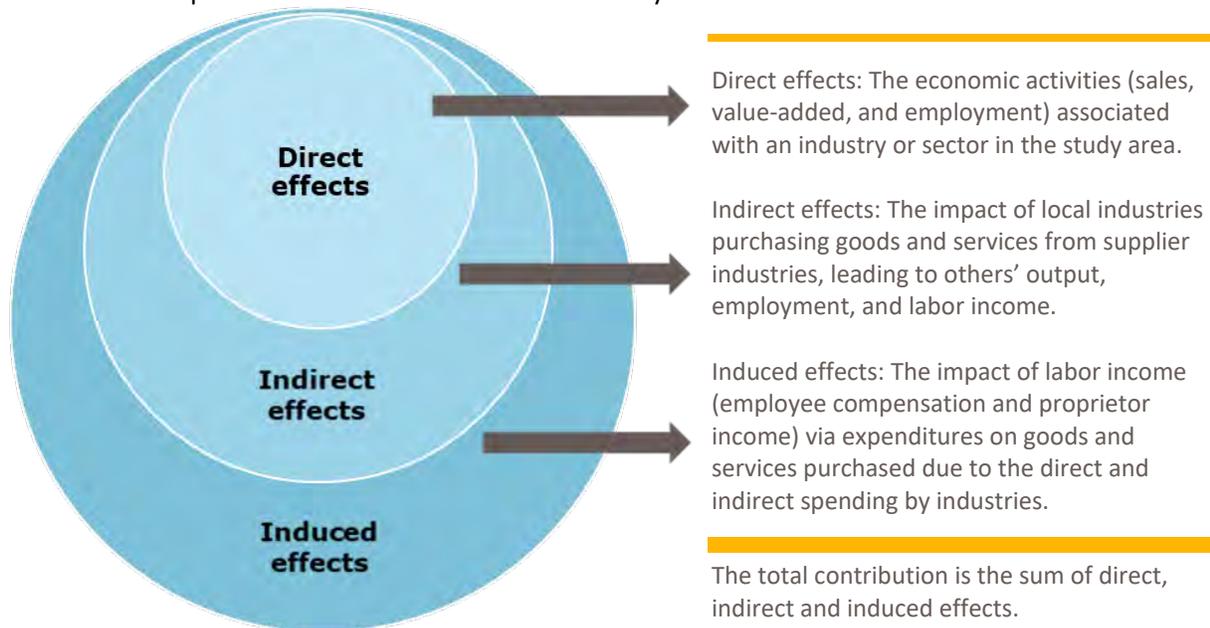
Economic Contributions Defined

Input-Output Analysis and IMPLAN

Forest products industries influence the economy in three ways: direct effects (when industries sell commodities in response to demand), indirect effects (as suppliers to directly impacted sectors), and induced effects (household spending by employees in directly and indirectly impacted sectors) (Exhibit

6). The total economic contribution is the value of production required to meet all the needs stemming from the initial activity—in this case, forest product–related purchases.

Exhibit 6. Concept of Total Economic Contribution Analysis



IO modeling using IMPLAN software and data is a conventional approach for documenting forest products industries' economic contributions. This analysis used the matrix inversion approach with external IMPLAN model adjustment as a primary method for estimating economic contributions of forest products industries in Illinois (Gibson, Leefers, and Poudel 2020). Major economic indicators generated by IMPLAN include employment (full- and part-time jobs), labor income, total output, and value-added.

Interaction Between State and Regional Analyses

IMPLAN models are based on interactions across the economy. One important aspect of these interactions is whether commodities are sourced locally or imported. In smaller areas (e.g., counties), fewer commodities are sourced locally. As a result, leakages occur when purchases are made—that is, fewer dollars stay in the local economy.

Larger economies have fewer leakages, and more commodities are sourced locally. For example, an examination of the logging industries (IMPLAN sector 16) in Illinois and Indiana reveals that the direct employment for 2017 was 705 and 1,422 jobs, respectively. Summing the individual state's total employment contributions (direct, indirect, and induced) yields 2,975 jobs. However, if the states are combined as one region, the total employment contribution increases to 3,039 jobs. This increase reflects less leakage and more local purchases.

The larger role is due to trade, but IMPLAN does not explicitly show trade with specific states, only overall imports and exports. The regional analysis highlights the larger role of forest products industries in the region's economy. Consequently, the state-level analyses underestimate the actual contributions from a regional perspective.

Economic Contribution Results

This section presents direct and total contributions for all forest products industries, direct and total contributions by forest product industry groups (e.g., logging, furniture, etc.), the top forest products sectors, and the top non-forest products sectors affected by the forest products industries. Finally, this section compares forest industries in nearby states, other natural resources industries, and manufacturing industries within the state.

Forests and forest products industries are central for the transition to a greener and more sustainable economy. A green goods and services economy relies on the sustainable use of natural resources, and Illinois's forest products industries are tightly bound to forests and the goods and ecosystem services that they provide (e.g., wildlife habitat, watershed protection, carbon sequestration, etc.).

Direct and Total Contributions by Forest Products Industries

Contribution analysis provides a means to assess the role various industries play in a state's economy. Illinois forest products industries' total economic contribution in terms of output was \$21.9 billion, based on direct output of \$12.9 billion (Exhibit 7). There were 38,554 direct jobs were associated with this level of economic activity, supporting a total of 90,102 jobs. Direct labor income, which includes employee compensation and proprietor income, was \$2.8 billion, or \$71,371 per job. Total labor income—which includes income paid directly to industry employees and proprietors, their suppliers, and the other industries they support—totaled \$6.0 billion.

Most state economies are large relative to any particular industry or group of industries, and the forest products industries are no exception. In 2017, Illinois's population was estimated at 12.8 million people, with total employment of 7.9 million. The gross state product was \$825.1 billion from 516 economic sectors (of the possible 536 in the U.S.). The GSP's largest component was labor income, which was \$502.1 billion.

Direct value-added for forest products industries was \$3.6 billion, 0.4 percent of Illinois's total GSP, increasing to 1.1 percent when considering total value-added effects. These percentages hold for other economic measures (e.g., jobs) as well.

Exhibit 7. Economic Contributions of the Forest Products Industries in Illinois, 2017 Dollars

Effect	Employment	Labor Income (Thousands of Dollars)	Value-added* (Thousands of Dollars)	Effect (Thousands of Dollars)
Direct	38,554	\$2,751,641	\$3,631,953	\$12,863,371
Total	90,102	\$5,995,900	\$8,994,987	\$21,851,360

* Value-added in IMPLAN is equivalent to GSP.

Direct and Total Contributions by Forest Product Industry Groups

As previously noted, the 32 IMPLAN forest products sectors were combined into seven industry groups (Appendix B). In Illinois, secondary paperboard and other paper products was the largest of these groups in terms of direct employment, labor income, value-added, and output (Exhibit 8). Wood furniture was the second largest group in terms of direct employment, labor income, value-added, and output. Forestry, which includes maple syrup production, timber tract operations, and forestry support activities, was the smallest group for employment and output. Logging was the smallest group for labor income and value-added.

Secondary paperboard and other paper products accounted for nearly two-thirds of the output of forest products industries. Three-quarters of forest products industries employment was in the secondary paperboard and other paper products and wood furniture.

Exhibit 7. Direct Economic Contributions in Illinois, Industry Groups, 2017

Industry Group	Employment	Labor Income (Thousands of Dollars)	Value-added (Thousands of Dollars)	Output (Thousands of Dollars)
Forestry	499	\$10,472	\$12,188	\$22,227
Logging	705	\$4,713	\$8,067	\$23,565
Primary solid wood products	1,201	\$50,761	\$86,731	\$487,465
Secondary solid wood products	6,304	\$298,112	\$376,276	\$1,149,448
Wood furniture	10,808	\$651,738	\$915,132	\$2,101,745
Pulp, paper, and paperboard mills	1,081	\$139,691	\$196,595	\$852,881
Secondary paperboard and other paper products	17,956	\$1,596,156	\$2,036,965	\$8,226,039
Total	38,554	\$2,751,641	\$3,631,953	\$12,863,371

Exhibit 8. Total Economic Contributions in Illinois, Industry Groups, 2017

Industry Group*	Employment	Labor Income (Thousands of Dollars)	Value-added (Thousands of Dollars)	Output (Thousands of Dollars)
Forestry	553	\$13,954	\$18,821	\$33,745
Logging	319	\$3,851	\$6,555	\$14,925
Primary solid wood products	3,081	\$167,216	\$281,492	\$779,822
Secondary solid wood products	11,828	\$639,865	\$939,094	\$2,102,131
Wood furniture	20,235	\$1,225,143	\$1,860,965	\$3,711,006
Pulp, paper, and paperboard mills	4,496	\$350,083	\$553,489	\$1,422,867
Secondary paperboard and other paper products	49,589	\$3,595,788	\$5,334,572	\$13,786,862
Total	90,102	\$5,995,900	\$8,994,987	\$21,851,360

*Forestry and logging are reported in this table, but most of their contributions are as indirect inputs or intermediate inputs used for production in the other five industry groups.

For the following sector-specific discussions, refer to Exhibit 8 for direct contribution details and Exhibit 9 for total contribution details. See Appendix C for detailed economic measures for industry groups and their component sectors.

Forestry

The forestry group includes timber tract operations, establishments primarily engaged in the operation of timber tracts for the purpose of selling standing timber, and support activities for forestry such as estimating timber; forest firefighting; forest pest control; treating burned forests from the air for reforestation or on an emergency basis; and consulting on wood attributes and reforestation related to timber production, wood technology, forestry economics and marketing, and forest protection.

Out of seven industry groups, forestry was the smallest in terms of direct employment in 2017. Direct contributions were \$22.2 million in output, 499 jobs, \$10.5 million in labor income, and \$12.2 million value-added. Total contributions are based, in part, on backward linkages to suppliers. Total contributions for forestry can be lower than direct contributions (i.e., initial IMPLAN levels) because many of the contributions are inputs into other industries. For example, 12 percent of forestry jobs are counted as contributions in other industries, mostly logging and primary solid wood products (e.g., sawmills). Hence, the total contributions displayed in Exhibit 9 underrepresent the industry's broader contributions. In other words, reporting total contributions for forestry is somewhat misleading because much of the forestry total contribution effects are hidden in the total contributions of other industries. The same holds true for logging below.

Logging

The logging industry group contains establishments primarily engaged in one or more of the following: cutting timber, cutting and transporting timber, and producing wood chips in the field. Logging was the third smallest in terms of direct employment. The direct contributions of logging were \$23.6 million in output, 705 jobs, \$4.7 million in labor income, and \$8.1 million in value-added. Most logging activity is an input into production in other industries, especially for manufacturing primary solid wood products (e.g., lumber), paper, and paperboard. In Illinois, 60 percent of logging jobs are included in the total contributions of other industries. As with forestry, logging's total contributions are underrepresented due to their inclusion in other industries.

Primary Solid Wood Products

The primary solid wood products industry group was the fourth largest group in terms of direct employment in Illinois. Primary solid wood products sectors include wood-based electric power generation, sawmills, wood preservation, veneer and plywood manufacturing, and reconstituted and wood product manufacturing industries. The direct contributions of the group were \$487.5 million in output, 1,201 jobs, \$50.8 million in labor income, and \$86.7 million in value-added. Total contributions for primary solid wood products, including direct, indirect and induced effects, were \$779.8 million in output, 3,081 jobs, \$167.2 million in labor income, and \$281.5 million in value-added. Many primary solid wood products (e.g., lumber and panels) are inputs in other industries, which counted in other industries' total contributions.

Secondary Solid Wood Products

Secondary solid wood products was the third largest group in terms of direct employment in Illinois. This group contains engineered wood member and truss manufacturing; wood windows and doors manufacturing; cut stock, resawing lumber, and planing; other millwork, including flooring, wood container, and pallet manufacturing; manufactured home (mobile home) manufacturing; prefabricated wood building manufacturing; and all other miscellaneous wood product manufacturing. Direct contributions of secondary solid wood products were \$1.1 billion in output, 6,304 jobs, \$298.1 million in labor income, and \$376.3 million in value-added. Total contributions were \$2.1 billion in output, 11,828 jobs, \$639.9 million in labor income, and \$939.1 million in value-added.

Wood Furniture

Wood furniture was the second largest group in terms of direct employment in Illinois. Wood furniture includes wood kitchen cabinet and countertop manufacturing; upholstered household furniture manufacturing; nonupholstered wood household furniture manufacturing; institutional wood furniture manufacturing; wood office furniture manufacturing; custom architectural woodwork and millwork manufacturing; and showcase, partition, shelving, and locker manufacturing. Direct contributions of wood furniture were \$2.1 billion in output, 10,808 jobs, \$651.7 million in labor income, and \$915.1

million in value-added. Total contributions of wood furniture were \$3.7 billion in output, 20,235 jobs, \$1.2 billion in labor income, and \$1.9 billion in value-added.

Pulp, Paper, and Paperboard Mills

The pulp, paper, and paperboard mills industry group was the third smallest in terms of direct employment in Illinois. The group includes pulp mills, paper mills, and paperboard mills that make paper or pulp from raw wood and from purchased pulp. This group's direct contributions were \$852.9 million in output, 1,081 jobs, \$139.7 million in labor income, and \$196.6 million in value-added. Total contributions were \$1.4 billion in output, 4,496 jobs, \$350.1 million in labor income, and \$553.5 million in value-added.

Secondary Paperboard and Other Paper Products

The secondary paperboard and other paper products group was the largest in terms of direct employment in Illinois. The group comprises paper and paperboard manufacturing, paper bag and coated and treated paper manufacturing, stationery product manufacturing, sanitary paper product manufacturing, and all other converted paper product manufacturing. Facilities in this group manufacture products from purchased pulp, paper, paperboard, or recycled materials. The direct contributions in 2017 were \$8.2 billion in output, 17,956 jobs, \$1.6 billion in labor income, and \$2.0 billion in value-added. Total contributions were \$13.8 billion in output, 49,589 jobs, \$3.6 billion in labor income, and \$5.3 billion value-added.

Top Forest Product Sectors

Among the 32 industry sectors that comprise the seven industry groups listed above, the leading sectors varied by the contribution measure examined. In terms of direct jobs, the four largest forest products sectors are paperboard container manufacturing (12,104 jobs), paper bag and coated and treated paper manufacturing (3,936 jobs), wood kitchen cabinet and countertop manufacturing (3,165 jobs), and showcase, partition, shelving, and locker manufacturing (2,955 jobs). These sectors reflect the diversity of manufacturing in the state.

The paperboard container manufacturing sector comprises establishments primarily engaged in converting paperboard into containers without manufacturing paperboard. These establishments use corrugating, cutting, and shaping machinery to form paperboard into containers. Products made by these establishments include boxes, corrugated sheets, pads, pallets, paper dishes, fiber drums, and reels.

The paper bag and coated and treated paper manufacturing sector comprises establishments primarily engaged in one or more of the following: cutting and coating paper and paperboard; cutting and laminating paper, paperboard, and other flexible materials (except plastics film to plastics film); manufacturing bags, multiwall bags, sacks of paper, metal foil, coated paper, laminates, or coated

combinations of paper and foil with plastics film; manufacturing laminated aluminum and other converted metal foils from purchased foils; and surface coating paper or paperboard.

The wood kitchen cabinet and countertop manufacturing sector covers establishments primarily engaged in converting paper or paperboard into products (except containers, bags, coated and treated paper, stationery products, and sanitary paper products) or converting pulp into pulp products, such as egg cartons, food trays, and other food containers from molded pulp.

The showcase, partition, shelving, and locker manufacturing sector comprises establishments primarily engaged in manufacturing wood and non-wood office and store fixtures, shelving, lockers, frames, partitions, and related fabricated products of wood and non-wood materials, including plastics laminated fixture tops. The products are made on a stock or custom basis and may be assembled or unassembled (i.e., knockdown). Establishments exclusively making furniture parts (e.g., frames) are included in this industry. Like institutional furniture manufacturing, this sector includes both wood and non-wood components.

These same four sectors had the highest labor income, value-added, and output as well, though the position of the sectors from highest to fourth highest varied by metric. In terms of labor income—from highest to fourth highest—paperboard container manufacturing; paper bag and coated and treated paper manufacturing; showcase, partition, shelving, and locker manufacturing; and wood kitchen cabinet and countertop manufacturing had the highest labor income, totaling \$1.7 billion. These sectors, in this order also had the highest value-added, totaling \$2.3 billion and the highest output, totaling \$8.6 billion.

Top Nonforest Industries Impacted

Contribution analysis using IMPLAN relies on backward linkages from forest products industries sectors among themselves and to other sectors in Illinois. Including the 30 forest products industries present in Illinois, 184 sectors were impacted in 2017 (counting sectors with ten or more jobs supported). The top ten sectors (excluding forest products sectors) included wholesale trade, restaurants, management of companies and enterprises, trucking, and real estate (Exhibit 10). This set of sectors reflects indirect and induced spending by forest products companies, their suppliers, and individuals.

These data were at an aggregate level, so 1,809 jobs in truck transportation included log trucks, delivery trucks, and office jobs for some trucking companies, among others. Seven of these sectors were among the top ten sectors in the state of Illinois (wholesale trade was number two, followed by real estate, hospitals, employment services, and full- and limited-service restaurants—each had over 200,000 jobs).

Exhibit 9. Direct Jobs Impacted by the Forest Products Industries Among Illinois' Top Ten Non-Forest Products Industries in 2017

Sector	Description	Jobs
395	Wholesale trade	3,929
501	Full-service restaurants	2,002
502	Limited-service restaurants	1,953
461	Management of companies and enterprises	1,825
411	Truck transportation	1,809
440	Real estate	1,725
482	Hospitals	1,534
468	Services to buildings	1,415
464	Employment services	1,260
405	Retail—General merchandise stores	873
Total	NA	18,326

Neighboring States

The midwestern states of Illinois, Indiana, Iowa, and Missouri are important for forest products. Forest products industries employ 132,181 workers across these states and account for \$37.7 billion in direct output (Exhibits 11 and 12). Indiana had the largest forest products economy with 50,093 direct jobs and output of \$12.9 billion. Illinois had the second largest forest products industry with 38,554 direct jobs and output of \$12.9 billion. Iowa's forest products economy was the smallest of these four states. The three largest industry groups, each with over 33,000 employees, were wood furniture, secondary paperboard and other paper products, and secondary solid wood products.

Exhibit 10. Forest Products Industries Direct Employment in Illinois, Indiana, Iowa, and Missouri, 2017

Industry	Illinois	Indiana	Iowa	Missouri
Forestry	499	356	94	536
Logging	705	1,422	610	2,270
Primary solid wood products	1,201	3,485	590	3,053
Secondary solid wood products	6,304	12,572	9,038	5,989
Wood furniture	10,808	22,062	3,751	7,063
Pulp, paper, and paperboard mills	1,081	1,202	63	460
Secondary paperboard and other paper products	17,956	8,995	3,688	6,329
Sum of Direct Contributions	38,554	50,093	17,834	25,699

Exhibit 12. Forest Products Industries Direct Output in Illinois, Indiana, Iowa, and Missouri, 2017
(Thousands of Dollars)

Industry	Illinois	Indiana	Iowa	Missouri
Forestry	\$22,227	\$30,689	\$5,317	\$35,816
Logging	\$23,565	\$241,876	\$39,080	\$199,936
Primary solid wood products	\$487,465	\$997,860	\$177,580	\$894,618
Secondary solid wood products	\$1,149,448	\$2,596,710	\$2,064,553	\$1,106,338
Wood furniture	\$2,101,745	\$3,984,937	\$581,969	\$1,187,050
Pulp, paper, and paperboard mills	\$852,881	\$969,400	\$67,209	\$399,724
Secondary paperboard and other paper products	\$8,226,039	\$4,062,026	\$2,042,494	\$3,162,490
Sum of Direct Contributions	\$12,863,371	\$12,883,498	\$4,978,201	\$6,985,972

Importance of the Forest Products Industries in Context

To help contextualize the relative importance of the forest products industries, it is useful to compare the contribution of Illinois’s forest products industries with others. Natural resources and agricultural industries significantly contribute to the diversity of economic activities reflected in Illinois’s \$825.1 billion GSP. The forest products industries provide more direct labor income, value-added, and output than the commercial fishing, hunting, and trapping and mining and oil and gas production (Exhibit 13). Illinois’s forest products industries comprised 0.4 percent of the GSP in 2017. Agricultural production provided the largest amount of employment (full- and part-time), by far, of these industries.

Exhibit 11. Natural Resources and Agricultural Production Industries in Illinois, 2017

Industry	Employment	Labor Income (Thousands of Dollars)	Value-added (Thousands of Dollars)	Output (Thousands of Dollars)
Forest products	38,554	\$2,751,641	\$3,631,953	\$12,863,371
Commercial fishing, hunting, and trapping	809	\$1,045	\$13,507	\$13,660
Mining and oil and gas production	26,786	\$1,001,073	\$2,397,525	\$5,155,762
Agricultural production (plant crop and animal)	85,388	\$2,511,755	\$4,916,001	\$17,301,444
Total	151,536	\$6,265,515	\$10,958,986	\$35,334,238

Labor income per job is highest in forest products (\$71,371) and lowest in commercial fishing, hunting, and trapping (\$1,292). For agricultural production, the average per job is \$29,416; mining and oil and gas has the second highest average income at \$37,373.

Most of the forest products industries are manufacturers, however, the forestry, logging, and biomass power groups are not. There were 592,190 manufacturing jobs in Illinois in 2017, with 37,350 in the forest products industries, 6.3 percent of the total. Of 16 industries, forest products manufacturing was seventh in terms of employment after food, fabricated metal, machinery, plastics and rubber products, chemical, and transportation equipment manufacturing. It was ninth in labor income, tenth in value-added, and eighth in terms of output (Exhibit 14).

Exhibit 12. Manufacturing Industries in Illinois, 2017

Manufacturing Industries	Employment	Labor Income (Thousands of Dollars)	Value-added (Thousands of Dollars)	Output (Thousands of Dollars)
Food	93,046	\$6,407,459	\$12,497,337	\$59,238,859
Fabricated metal	91,724	\$6,702,280	\$10,438,549	\$24,154,489
Machinery	71,426	\$7,327,532	\$12,640,050	\$32,022,024
Plastics and rubber products	43,479	\$3,292,767	\$5,975,781	\$15,931,052
Chemical	42,996	\$6,673,367	\$19,086,023	\$48,143,056
Transportation equipment	42,183	\$3,371,803	\$5,377,603	\$30,704,310
Forest products	37,350	\$2,736,456	\$3,611,698	\$12,817,579
Miscellaneous	33,431	\$3,903,109	\$4,921,523	\$10,754,676
Printing	30,200	\$2,030,557	\$2,712,679	\$5,353,015
Computer and electronic product	27,726	\$2,785,874	\$5,085,226	\$11,069,196
Electrical equipment	22,509	\$2,301,495	\$3,489,955	\$9,223,269
Primary metal	17,967	\$1,663,738	\$2,160,644	\$9,502,434
Nonmetallic mineral product	14,950	\$1,248,642	\$2,207,291	\$5,530,893
Textiles and apparel	9,414	\$457,273	\$571,692	\$1,646,812
Beverage and tobacco product	8,114	\$500,156	\$1,757,370	\$5,859,644
Petroleum and coal	5,674	\$1,119,495	\$6,608,519	\$22,882,038
Total	592,190	\$52,522,004	\$99,141,940	\$304,833,347

Supplemental Economic Contribution Information

The report by Gibson, Leefers, and Poudel provides a detailed discussion of which sectors were included and excluded from this analysis (2020). Most economic data used in this report were derived from IMPLAN, with one notable exception.

For most of the partial sectors (Appendix B), ratios of published government data were used to identify a portion of the industry that would be treated as forest products. In cases where only part of an IMPLAN sector was associated with forest products, analysts faced three options. The most conservative

option was to include only sectors viewed as 100 percent in forest products, excluding sectors where only part produced forest products. At the other end of the spectrum, analysts could have focused on sectors producing any forest products at all, even if the forest products represented a small part of total output. Between these extremes, analysts could choose a third option—selecting the portion of a sector that produced forest products and include only that portion, mindful to include a means for assessing the magnitude of that portion. That is the approach used in this report.

Wood is used in many other products not covered by the 30 sectors highlighted in this report. For example, boats, blinds, musical instruments, burial caskets, organic chemicals, and pharmaceuticals may use wood directly or as an extract. However, the wood-only component of these product groups is difficult to quantify and was unable to be included in this report. Surveys could be designed and conducted to determine the forest products component of these sectors. In practice, the production functions, employment, output, and other metrics would need to be compiled and inserted into IMPLAN.

Summary

Over the last 20 years, individual states located in the midwestern and northeastern area of the United States have conducted statewide economic contributions studies of the forest products industries. However, these studies differed in approach, data used, and measures reported. Developing a consistent approach required funding that spanned multiple states. The Forest Markets & Utilization Committee of the Northeast—Midwest State Foresters Alliance secured grant funds through the Landscape Scale Restoration Program within the U.S. Forest Service, Eastern Region, State and Private Forestry to support investigation of the economic contributions of the forest products industry in the 20 northeastern and midwestern states and Nebraska. To that end, the Michigan Department of Natural Resources Forest Resources Division (serving as the lead on the grant project) contracted with Public Sector Consultants to facilitate discussions among the project partner states and to reach consensus on an appropriate analysis methodology and report template for both the regional and state reports, in addition to conducting the analysis.

This report serves as a snapshot of economic contributions of the forest products industries in Illinois for 2017, as well as a baseline report for future analyses. State data were used in this report, but given IMPLAN's structure, substate and multistate analyses can be developed. However, future analyses may again require funding from the U.S. Forest Service or other institutions for assessments across multiple states. Methods used in developing this report are consistent across the region. There were 38,554 direct jobs in the forest products industries, and overall, 90,102 jobs were supported. Direct labor income was \$2.8 billion with total labor income at \$6.0 billion. Direct value-added was \$3.6 billion, and the total contribution for value-added was \$9.0 billion. Finally, direct output was \$12.9 billion with a total contribution of \$21.9 billion in output. Similar report findings are available from other states in the region and are summarized in a regional report.

References

- Crocker, Susan J. 2018. [Forests of Illinois, 2017](#). Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. <https://doi.org/10.2737/FS-RU-147>
- Gibson, Melissa, Larry Leefers, and Jagdish Poudel. 2020. *Forest Products Industry Regional Economic Analysis: Methods*. Lansing: Public Sector Consultants.
- Parajuli, Rajan, James Henderson, Shaun Tanger, Omkar Joshi, and Ram Dahal. November 2018. "[Economic Contribution Analysis of the Forest-product Industry: A Comparison of the Two Methods for Multisector Contribution Analysis Using IMPLAN](#)." *Journal of Forestry* 116(6): 513–519. <https://doi.org/10.1093/jofore/fvy047>
- United States Department of Agriculture Forest Service. 2019. "[Forest Inventory EVALIDator](#)." *United States Department of Agriculture Forest Service Forest Inventory and Analysis Program*. Accessed October 22, 2019. <http://apps.fs.usda.gov/Evalidator/evalidator.jsp>

Appendix A: Methods and Data

Input-Output Analysis: IMPLAN

Several key decisions related to methods were developed through a consensus process (Gibson, Leefers, and Poudel 2020). The project team, in consultation with the states, made consensus decisions regarding the modeling method for estimating economic contributions, the forest products sectors to include in analysis (either in total or in part), the IMPLAN year for reporting results, and the use of an analysis spreadsheet for consistent reporting.

The economic contributions of the region and each state's forest products industries relied on 2017 IMPLAN software and data. IMPLAN is a widely used economic IO model that focuses on interdependence among various producing and consuming sectors in the economy. IMPLAN has 536 industry sectors for the 2017 data set and is based on the NAICS. IMPLAN data are compiled and linked by the IMPLAN software (Version 3.1.1001.12); data come from various government agencies, including the U.S. Census Bureau, the U.S. Bureau of Labor Statistics, and the U.S. Bureau of Economic Analysis. Economic measures in IMPLAN include employment, labor income, value-added, output, and others. More detailed information on data sources is available at [the IMPLAN website](#).

Wassily Leontief developed IO modeling in the mid-20th century. Impact analysis examines the effects of changes in demand in a regional economy, while contribution analysis can evaluate the role of several related sectors in a region. IMPLAN provides the software and data to conduct such analyses. Each sector has a production function tracing the backward linkages (i.e., suppliers) to other sectors. Various sectors produce commodities (e.g., the logging sector produces logs). Leakages (e.g., foreign and domestic imports/exports) to and from other regions are also modeled. Social accounting flows among industries, households, government, and capital are included in IMPLAN.

The analysis process begins with creating an IMPLAN model. One or more geographic areas (e.g., counties or states) are selected as the region. Then, models are run through the creation of multipliers. This report uses Social Accounting Matrix (SAM) multipliers. Next, activities are selected to estimate either economic impacts or contributions. For example, analysts can estimate the impacts of expanding or contracting industries. In the case of contribution analysis, it is important to ensure that the level of production does not exceed the actual level of production in the region. Contribution analysis essentially counters the effects of the multipliers.

Contributions can be in terms of value-added, output, employment, and/or labor income. Value-added is commonly used to describe an industry's economic contributions and is a conservative measure of these contributions. Value-added is the difference between an industry's output, and the costs of intermediate inputs. When a sawmill sells a board, the value of the log and other inputs is not counted in value-added because they were counted when produced by loggers and others. Thus, only new additions to value (e.g., labor income) are included. Labor income is the major component of value-

added and includes employee compensation and proprietor income. Value-added, summed across all sectors, is equal to GSP.

Another measure of economic contribution is industry output. For example, if a log is sold to a sawmill that sells boards, both sales are counted as part of the overall region's output, as they are important economic activities. Another measure, employment, includes both full- and part-time jobs. As the number of sectors in an analysis increases, there can be overlap in the number of part-time jobs across sectors.

Methods

IMPLAN estimates economic impacts (i.e., effects of economic changes) and contributions (i.e., effects of existing industries). Two methods for multisector economic contribution analysis are available (Parajuli et al., 2018), both requiring significant data manipulation.

The first method customizes the IMPLAN model by changing selected endogenous tables, whereas the second method adjusts input values based on matrix inversion prior to analysis. In method one, the changes are internal to IMPLAN and difficult to monitor from a quality control perspective.

Method two relies mostly on spreadsheet-based manipulation and is easier to monitor. When the contribution analysis is completed, direct effects from the IMPLAN sectors of interest equal the amounts shown in IMPLAN's "Industry Detail" table, and the total contributions (direct plus indirect plus induced) are estimated. Both methods prevent over reporting of total effects, which can occur if standard economic impact analysis is used when contribution analysis results are desired.

IMPLAN was designed for economic impact analysis. Multipliers ensure that the ripple effect manifests across the economy. A portion of those effects often involve self-purchases within the sector of interest. That is, if the output from the logging sector is \$1 million in a local economy, the economic impact of \$1 million in sales would be greater than that amount due to self-purchases. The contribution methods are designed to yield the \$1 million direct contribution and its associated effects. Put simply, the amount of sales (direct contribution) estimated cannot exceed the amount that actually exists. Methods one and two accomplish this.

The matrix inversion approach relies on developing a detailed social accounting matrix (SAM) output multipliers for each sector in the forest products industries. Hence, a 32x32 matrix is developed with the diagonal yielding a value close to 1.0 for the detailed multipliers relating each row-column sector to itself (e.g., logging to logging, sawmills to sawmills, etc.). The actual matrix can be developed in several ways. For example, the SAM matrix can be exported from IMPLAN and narrowed down to the appropriate row and columns for the forest products industries. Then, it can be used to develop detailed multipliers via matrix inversion. Alternatively, detailed multipliers can be exported and rearranged into a 32x32 matrix. The approach used in this report was to rely on a matrix developed by IMPLAN staff for

the state. Then, the matrix was inverted and multiplied the initial IMPLAN output values for forest industries sectors to yield inputs for IMPLAN analysis.

Appendix B: Forest Products Industries Groupings and IMPLAN Sectors

Exhibit B1. Forestry Industry Grouping and IMPLAN Sectors

IMPLAN Sector	Sector Name
10	Maple syrup production*
15	Forestry, forest products, and timber tract production
19	Support activities for forestry*

Note: Sectors with an “*” indicate that only a portion of the sector is included in the forest products industries.

Exhibit B2. Logging Industry Grouping and IMPLAN Sector

IMPLAN Sector	Sector Name
16	Commercial logging

Exhibit B3. Primary Solid Wood Products Industry Grouping and IMPLAN Sectors

IMPLAN Sector	Sector Name
47	Electric power generation—biomass*
134	Sawmills
135	Wood preservation
136	Veneer and plywood manufacturing
138	Reconstituted wood product manufacturing

Note: Sectors with an “*” indicate that only a portion of the sector is included in the forest products industries.

Exhibit B4. Secondary Solid Wood Products Industry Grouping and IMPLAN Sectors

IMPLAN Sector	Sector Name
137	Engineered wood member and truss manufacturing
139	Wood windows and doors manufacturing
140	Cut stock, resawing lumber, and planing
141	Other millwork, including flooring
142	Wood container and pallet manufacturing
143	Manufactured home (mobile home) manufacturing
144	Prefabricated wood building manufacturing
145	All other miscellaneous wood product manufacturing

Exhibit B5. Wood Furniture Industry Grouping and IMPLAN Sectors

IMPLAN Sector	Sector Name
368	Wood kitchen cabinet and countertop manufacturing
369	Upholstered household furniture manufacturing
370	Nonupholstered wood household furniture manufacturing
372	Institutional wood furniture manufacturing*
373	Wood office furniture manufacturing
374	Custom architectural woodwork and millwork manufacturing
376	Showcase, partition, shelving, and locker manufacturing*

Note: Sectors with an “*” indicate that only a portion of the sector is included in the forest products industries.

Exhibit B6. Pulp, Paper, and Paperboard Mills Industry Grouping and IMPLAN Sectors

IMPLAN Sector	Sector Name
146	Pulp mills
147	Paper mills
148	Paperboard mills

Exhibit B7. Secondary Paperboard and Other Paper Products Industry Grouping and IMPLAN Sectors

IMPLAN Sector	Sector Name
149	Paperboard container manufacturing
150	Paper bag and coated and treated paper manufacturing
151	Stationery product manufacturing
152	Sanitary paper product manufacturing
153	All other converted paper product manufacturing

Appendix C: Detailed Economic Contribution Results

Direct Economic Contribution by IMPLAN Sector

Exhibit C1. Direct Economic Contributions, Forestry Detail, 2017

Sector	Employment	Labor Income (Thousands of Dollars)	Value-added (Thousands of Dollars)	Output (Thousands of Dollars)
Forestry, forest products, and timber tract production	363	\$3,171	\$4,860	\$14,377
Support activities for forestry	136	\$7,301	\$7,328	\$7,850
Maple syrup production	-	-	-	-
Subtotal	499	\$10,472	\$12,188	\$22,227

Exhibit C2. Direct Economic Contributions, Logging Detail, 2017

Sector	Employment	Labor Income (Thousands of Dollars)	Value-added (Thousands of Dollars)	Output (Thousands of Dollars)
Commercial logging	705	\$4,713	\$8,067	\$23,565
Subtotal	705	\$4,713	\$8,067	\$23,565

Exhibit C3. Direct Economic Contributions, Primary Solid Wood Products Detail, 2017

Sector	Employment	Labor Income (Thousands of Dollars)	Value-added (Thousands of Dollars)	Output (Thousands of Dollars)
Electric power generation—biomass	-	-	-	-
Sawmills	494	\$16,471	\$19,930	\$128,720
Wood preservation	386	\$19,418	\$41,609	\$225,905
Veneer and plywood manufacturing	128	\$5,008	\$6,557	\$33,247
Reconstituted wood product manufacturing	193	\$9,864	\$18,634	\$99,593
Subtotal	1,201	\$50,761	\$86,731	\$487,465

Exhibit C4. Direct Economic Contributions, Secondary Solid Wood Products Detail, 2017

Sector	Employment	Labor Income (Thousands of Dollars)	Value-added (Thousands of Dollars)	Output (Thousands of Dollars)
Engineered wood member and truss manufacturing	426	\$19,167	\$22,311	\$90,791
Wood windows and doors manufacturing	988	\$54,186	\$70,602	\$226,078
Cut stock, resawing lumber, and planing	54	\$2,347	\$3,742	\$12,416
Other millwork, including flooring	648	\$30,684	\$43,472	\$134,110
Wood container and pallet manufacturing	2,885	\$126,232	\$153,211	\$447,291
Manufactured home (mobile home) manufacturing	23	\$780	\$1,269	\$5,162
Prefabricated wood building manufacturing	409	\$22,125	\$25,310	\$71,838
All other miscellaneous wood product manufacturing	869	\$42,590	\$56,359	\$161,762
Subtotal	6,304	\$298,112	\$376,276	\$1,149,448

Exhibit 13. Direct Economic Contributions, Wood Furniture Detail, 2017

Sector	Employment	Labor Income (Thousands of Dollars)	Value-added (Thousands of Dollars)	Output (Thousands of Dollars)
Wood kitchen cabinet and countertop manufacturing	3,165	\$161,983	\$200,341	\$486,391
Upholstered household furniture manufacturing	697	\$41,616	\$56,032	\$153,400
Nonupholstered wood household furniture manufacturing	1,398	\$74,509	\$116,661	\$222,811
Institutional wood furniture manufacturing	1,169	\$71,122	\$97,175	\$245,274
Wood office furniture manufacturing	267	\$18,049	\$37,243	\$74,380
Custom architectural woodwork and millwork manufacturing	1,158	\$105,969	\$141,500	\$251,563
Showcase, partition, shelving, and locker manufacturing	2,955	\$178,489	\$266,180	\$667,926
Subtotal	10,808	\$651,738	\$915,132	\$2,101,745

Exhibit 14. Direct Economic Contributions, Pulp, Paper, and Paperboard Mills Detail, 2017

Sector	Employment	Labor Income (Thousands of Dollars)	Value-added (Thousands of Dollars)	Output (Thousands of Dollars)
Pulp mills	8	\$2,388	\$2,637	\$6,907
Paper mills	584	\$72,415	\$106,648	\$448,150
Paperboard mills	488	\$64,887	\$87,310	\$397,823
Subtotal	1,081	\$139,691	\$196,595	\$852,881

Exhibit C7. Direct Economic Contributions, Secondary Paperboard and Other Paper Products Detail, 2017

Sector	Employment	Labor Income (Thousands of Dollars)	Value-added (Thousands of Dollars)	Output (Thousands of Dollars)
Paperboard container manufacturing	12,104	\$1,030,433	\$1,285,493	\$5,668,266
Paper bag and coated and treated paper manufacturing	3,936	\$374,154	\$499,971	\$1,801,839
Stationery product manufacturing	822	\$74,466	\$95,448	\$318,668
Sanitary paper product manufacturing	124	\$20,202	\$40,114	\$104,645
All other converted paper product manufacturing	971	\$96,901	\$115,938	\$332,621
Subtotal	17,956	\$1,596,156	\$2,036,965	\$8,226,039

Note: Value-added in IMPLAN is equivalent to gross state product.

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