



Forest Products Industries' Economic Contributions: Minnesota, 2023



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Foreword

I'm pleased to present the latest Minnesota Forest Products Industries' Economic Contributions report. The Minnesota Department of Natural Resources recognizes the importance of the forest products industry in conserving and sustainably managing the state's natural resources. Minnesota's forests create a sustainable quality of life by providing clean water, wildlife habitat, outdoor recreation opportunities, and commercial uses of natural resources, such as renewable and recyclable wood fiber. Additionally, forests and wood products play an important role as natural climate solutions.

Forest products manufacturing is the fifth largest sector in the state by employment. The forest products economy provides the market force to sustainably manage forests, keeping them healthy, diverse, and resilient to climate change. This report highlights the importance of the forest product industries' economic contributions to our state's sustainable natural resource economy.

Sincerely,

Patty Thielen, State Forester

MN Department of Natural Resources Division of Forestry

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Executive Summary

Based on 2023 FIA estimates, Minnesota contains approximately 17.57 million acres of forest land, representing about 34.7 percent of its total land area. Of this forest base, 89.4 percent (15.70 million acres) is classified as timberland capable of producing commercial volumes of wood, while 10.6 percent consists of reserved or low-productivity forestland. Private ownership accounts for the majority of forest land at 44.5 percent (7.81 million acres), followed by state and local governments (39.2 percent; 6.89 million acres) and federal ownership (16.3 percent; 2.87 million acres). This report summarizes the economic contribution of forest products industries in Minnesota using IMPLAN 2023 data. This report also captures the pre-and post-COVID snapshots of forest products industries in Minnesota and shows the changes in last five years.

Forest Product Industries

This report analyzes the economic contribution of Minnesota's forest products sector, comprised of 30 individual economic sectors aggregated into seven industry groups: Forestry, Logging, Primary solid wood products, Secondary solid wood products, Wood furniture, Pulp, paper, and paperboard mills, and Secondary paperboard and other paper products. In 2023, these industries directly supported 33,990 jobs and generated \$12.89 billion in output, \$4.47 billion in value added, and \$2.82 billion in labor income. When indirect supply-chain linkages and induced household-spending effects are included, the sector's total economic footprint reached 71,198 jobs, \$21.26 billion in output, \$9.30 billion in value added, and \$5.68 billion in labor income. The sector exerts a notable multiplier effect on the broader economy; for every 100 direct jobs in the forest industry, roughly 109 additional jobs are supported elsewhere in the state.

Leading Forest Products Industry Groups (direct contribution)

Among the seven aggregated groups, Secondary Solid Wood Products was the largest direct employer in 2023 (13,144 jobs), followed by Wood Furniture (8,442 jobs) and Secondary Paperboard and Other Paper Products (6,135 jobs). In terms of output, Secondary Solid Wood Products produced the highest direct output at \$4.43 billion, serving as the sector's manufacturing engine. Secondary Paperboard and Other Paper Products generated \$3.50 billion, highlighting the state's strength in converting and packaging. Forestry, while the smallest contributor in dollar terms (\$43.4 million), provided the essential management and biological services supporting the broader value chain.

Leading Individual Forest Products Sectors (direct contribution)

At the disaggregated level, across 30 forest product sectors, wood windows and door manufacturing remained the top individual employer, supporting 7,964 jobs. Minnesota is also a regional leader in wood windows and door manufacturing. Within the Northeast-Midwest region, the state ranked second in employment after Iowa, while ranking first in output, value added, and labor income for this industry. Financial dominance was also concentrated in this sector, which ranked first in Labor Income (\$783.5 million), Value Added (\$1.10 billion), and Output (\$2.72 billion). Wood kitchen cabinet and countertop manufacturing was a consistent top-tier performer, ranking second in Employment (5,190 jobs), though Paperboard container manufacturing outpaced it in output (\$2.10 billion) and value added (\$546.8 million). Paper mills also emerged as a major driver, ranking third in direct output (\$1.05 billion), and value added (\$476.7 million). These rankings show a downstream-focused economy: specialized secondary manufacturing (Windows, Doors, and Packaging) dominating over primary processing.

Minnesota's Forest Products Industries Compared to Other Minnesota Industries

The Forest Products sector remains a vital component of Minnesota's natural resource economy. In 2023, it ranked second in both employment and output when compared to Agriculture, Mining, and Commercial Fishing. The forest sector's direct output (\$12.89 billion) trailed Agriculture (\$24.30 billion) but outperformed Mining (\$10.28 billion) and Commercial Fishing (\$81.4 million). In terms of employment, the 33,991 jobs supported by the forest industry accounted for roughly 25 percent of the state's total natural resources workforce, ranking behind Agriculture (86,763 jobs) but significantly surpassing Mining (13,317 jobs) and Commercial Fishing (909 jobs). Furthermore, within the statewide manufacturing landscape, Forest Products ranked as the sixth largest manufacturer by output (\$12.67 billion) and the fifth largest employer.

Seven-years Trends in Minnesota's Forest Products Industries Economic Contribution

From 2017 to 2023, the sector demonstrated remarkable structural stability and resilience. Direct employment decreased by a negligible 0.2 percent, while direct output declined by 2.1 percent in real terms. Notably, real Value Added actually increased by 2.2 percent despite the slight dip in output. This trend shows a divergence in the state's forest economy, where efficiency gains have allowed the industry to generate more wealth per unit of production, stabilizing the sector as a reliable economic anchor during a period of broader post-pandemic fluctuation.

Glossary

Forestry Terms

Average annual harvest removals: The estimated volume of 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 volume of trees that were live at the time of the previous inventory and are dead in the current inventory.

Average annual net growth: The change in merchantable bole volume of growing-stock trees (at least five inches diameter at breast height [DBH]) after deducting mortality volume on forest land.

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 non-forested lands that are at least 10 percent stocked with trees 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 (at least five inches DBH). 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 is not withdrawn from timber utilization by statute or administrative regulation. (Note: Areas qualifying as timberland can produce at least 0.27 standard cord per acre per year of industrial wood in natural stands. Currently inaccessible and inoperable areas are included.)

Economic Contribution Terms

Direct effects/contributions: The direct contribution represents the economic activities (output, employment, labor income, and value-added) that occur within an industry or sector as a result of its existing production to satisfy current (exogenous) final demand. In contribution analysis, the direct effect corresponds to the sector's own production activities that maintain the structure of the regional economy. For example, the direct contribution of the forest products industry reflects its ongoing production and employment required to meet current local and export demand for forest-based goods.

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

Indirect effects/contributions: The indirect contribution captures the inter-industry linkages created when the industry purchases goods and services from other local industries. These transactions stimulate additional production, employment, and income along the supply chain. For instance, demand for wood products generates additional output in sectors such as transportation, wholesale trade, and equipment manufacturing that supply inputs to the forest industry. The magnitude of indirect contribution reflects the degree of interdependence and strength of local supply-chain relationships.

Induce effects/contributions: The induced contribution measures the additional economic activity generated by household spending of labor income earned through direct and indirect effects. When workers employed in the forest products and related supply-chain sectors spend their income on goods and services, such as housing, healthcare, or retail, it further stimulates regional economic activity. This household feedback effect represents the cyclical flow of income and expenditures within the economy.

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 the 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 Minnesota’s economy. They provide jobs, raw materials, and finished goods that generate additional economic activity throughout the state, region, and nation. Forests in Minnesota have always supported local and state economies and generated employment and income (Leefers 2014, 2015; Poudel, 2022). These forests form the foundation for a wide array of industries, supporting logging, sawmills, pulp and paper, wood products manufacturing, and furniture production. Collectively, the Forest Products Industry (FPI) contributes directly to the economic development of the region, while also supporting rural livelihoods, providing raw materials for construction and packaging, and generating substantial downstream linkages to other industries (Poudel and Dahal 2025; Lamsal et al. 2025a). The scale and diversity of activities across the FPI underscore its role as a major part of the broader manufacturing economy, contributing to value added and sustaining consumer demand (Lamsal et al. 2025b).

A state report on FPI contributions on Minnesota was previously published by Leefers et al. (2020) using 2017 IMPLAN data. The present update extends that effort using 2023 data, allowing for a comparison across time. This analysis measures how the performance of forest sector industries in Minnesota has shifted between 2017 and 2023 in terms of employment, output, labor income, and the Gross State Product (GSP), also known as value added¹. Tracking these changes is essential, as it provides a clear picture of both long-term trends and the more recent disruptions caused by the COVID-19 pandemic. The pandemic had economy-wide effects on supply chains, consumer demand, and labor markets (Poudel and Dahal 2025; Lamsal et al. 2025b), and this report therefore captures the pre- and post-COVID conditions of the FPI within the region.

This trend analysis can be used in multiple ways by related stakeholders. For policymakers, it offers a benchmark for monitoring the health of one of the region’s key resource-based industries and helps inform workforce development, investment, and rural economic policies. For industry stakeholders, it provides insight into productivity, competitiveness, and sectoral resilience, supporting strategic planning. For researchers and forest managers, it offers a consistent regional framework that connects forest resources with industrial performance and economic outcomes.

¹ The 2017 results in this report are based on data from the IMPLAN Pro desktop version, whereas the 2018–2023 results are based on the IMPLAN web platform. Because there are minor differences between the Pro and web versions, the 2017 estimates shown here may not exactly match 2017 results reproduced from the web version. To maintain consistency with the original 2017 report and ensure a valid basis for comparison and trend analysis, we use the original 2017 IMPLAN Pro data, and IMPLAN web data for all years from 2018 through 2023.

The inventory data used in this report were sourced from the U.S. Forest Service Forest Inventory and Analysis (FIA) database and the economic data were obtained from Impact Analysis for Planning (IMPLAN). These data and related information are presented in four major sections: (i) Forest Resources of Minnesota, (ii) Economic Contributions of the Minnesota FPIs, (iii) Comparing FPIs with other industries and neighbor states, and (iv) Summary. We acknowledge that, due to rounding, some values in the tables and figures may not sum to the exact total indicated.

Forest Resources of Minnesota state

According to 2023 estimates from the USDA Forest Inventory and Analysis (FIA) program, Minnesota's total land area totals 50.70 million acres. Of this, 17.57 million acres (34.7 percent) meet the FIA definition of forest land, while the remaining 33.13 million acres (65.3 percent) are classified as non-forest land. FIA defines forest land as land at least 10 percent stocked by trees of any size, including areas that formerly supported such tree cover and that will be naturally or artificially regenerated. Within Minnesota's forest land base, timberland accounts for 15.70 million acres, or 89.4 percent (Figure 1), representing unreserved forest capable of producing at least 0.27 standard cord of wood per acre per year. Reserved forestland comprises 1.45 million acres (8.2 percent) and is withdrawn from timber utilization by legal or administrative designation. Other forestland totals 0.42 million acres (2.4 percent) and consists of unreserved forests of low productivity, generally yielding less than 0.27 standard cord per acre per year. In practical terms, approximately 15.70 million acres are available and biophysically suitable for commercial timber management, while about 1.87 million acres are either reserved or too low

in productivity to contribute materially to timber supply.

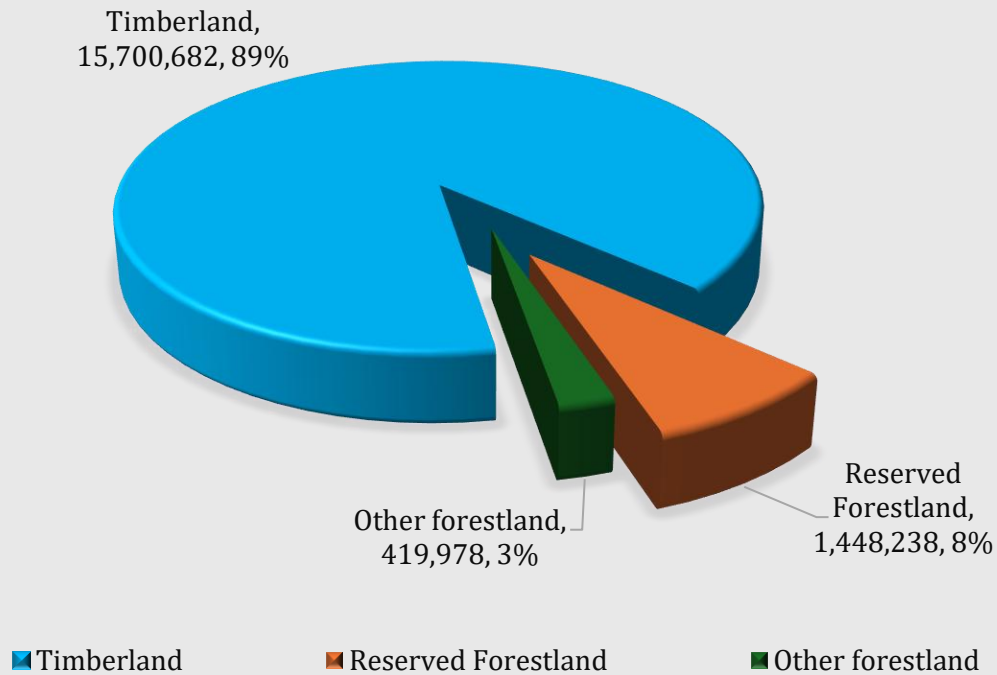


Figure 1: Minnesota Forest Land area in acres by Land use type, 2023 (US Forest Service).

Ownership of Minnesota’s 17.57 million acres of forest land is distributed among federal, state and local, and private entities, with private owners holding the largest share (Figure 2). Private landowners manage 7.81 million acres (44.5 percent) of the state’s forest land. State and local governments are responsible for 6.89 million acres (39.2 percent), while federal ownership totals 2.87 million acres (16.3 percent). Within the federal category, National Forests account for 2.62 million acres (14.9 percent), and other federal agencies manage 251,060 acres (1.4 percent).

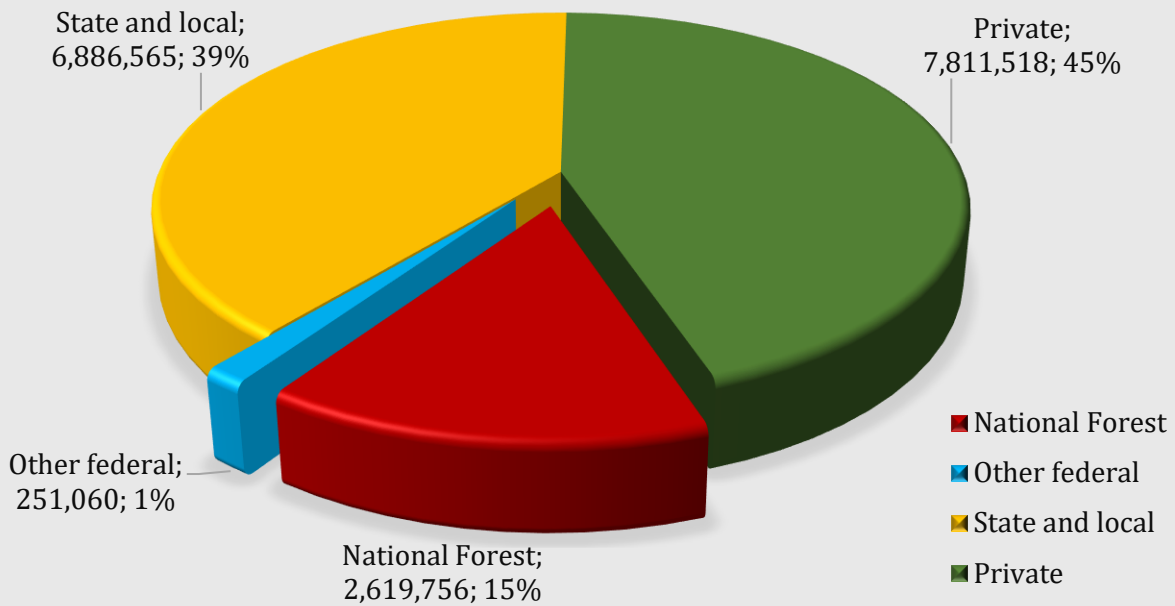


Figure 2: Minnesota Forest Land area in acres by Ownership group, 2023 (US Forest Service).

Hardwoods dominate Minnesota’s 17.57 million acres of forest land. The aspen/birch forest-type group is the most extensive, occupying 6.45 million acres (37 percent) of the total forest area (Figure 3). The spruce/fir group follows with 4.26 million acres (24 percent), reflecting the substantial presence of conifer-dominated forests across northern portions of the state. Among other major hardwood-associated groups, oak/hickory accounts for 2.25 million acres (13 percent), elm/ash/cottonwood comprises 1.66 million acres (9 percent), and maple/beech/birch totals 1.18 million acres (7 percent). The remaining 1.76 million acres (10 percent) are distributed across other forest-type groups. Taken together, the primary hardwood-associated groups listed above represent roughly two-thirds of Minnesota’s forest land area, while spruce/fir alone accounts for approximately one-quarter, with the balance classified in other types.

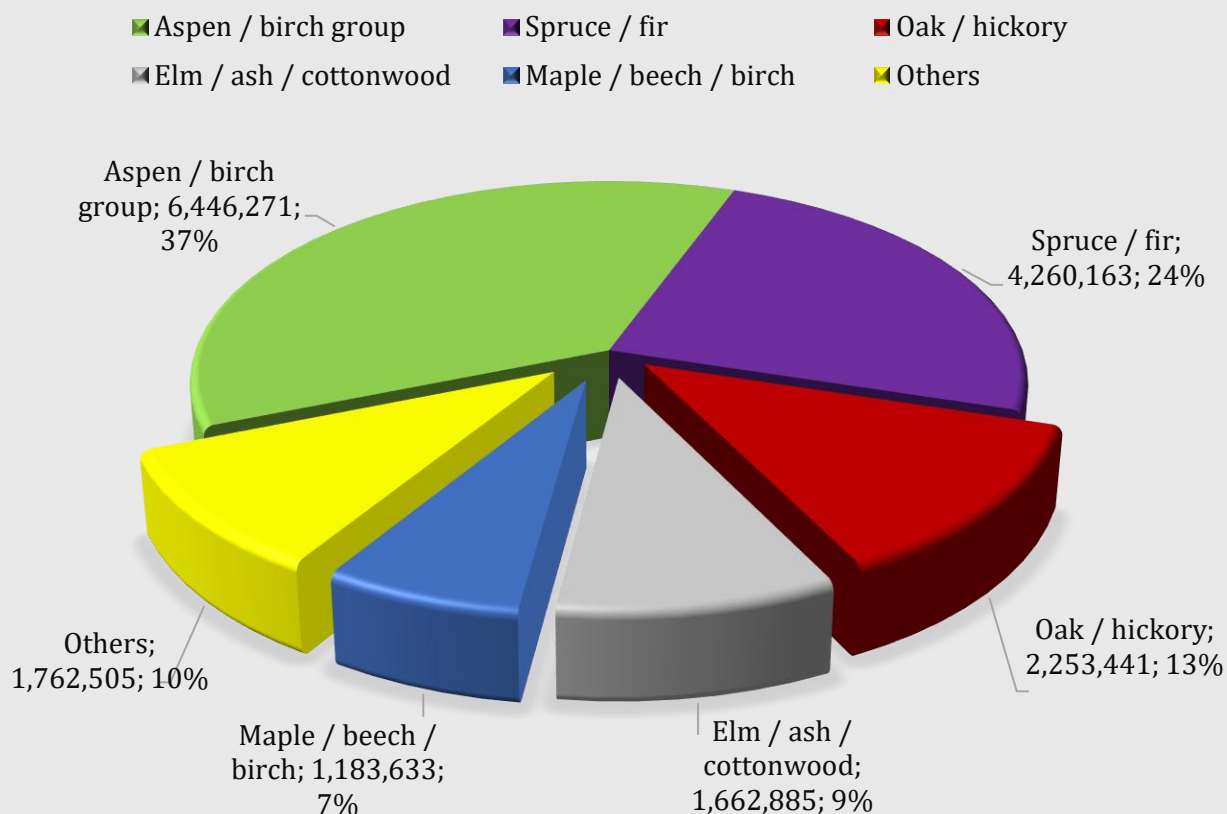


Figure 3: Minnesota Forest Land area in acres by Forest type group, 2023 (US Forest Service).

Minnesota’s timber resource base supports a broad set of forest-based supply chains, spanning forest management and commercial logging through primary wood processing and pulp and paper manufacturing. The estimated volume of standing timber suitable for forest products, defined here as the marketable volume of growing stock, is approximately 301.2 million standard cords (Table 1). Of this total, hardwoods account for 205.0 million standard cords, or 68.1 percent, while softwoods account for 96.2 million standard cords, or 31.9 percent. By ownership class, about 48.7 percent of growing-stock volume is on private lands, 32.3 percent is on state and local lands, 17.2 percent is on National Forest lands, and 1.8 percent is on other federal holdings.

Average annual net growth totals 7.7 million standard cords per year, while average annual harvest removals total 3.0 million standard cords and average annual mortality totals 4.0 million standard cords per year. Net growth exceeds harvest removals by a ratio of about 2.6 to 1, indicating that removals remain below net biological growth statewide. Because net growth is already net of mortality, the implied annual net change in growing-stock volume is net growth minus harvest removals, or approximately 4.7 million standard cords per year. This positive balance indicates continued expansion of growing-stock volume at the statewide level. Average

annual harvest removals equal roughly 1.0 percent of standing volume, while mortality represents about 1.3 percent of standing volume. Hardwoods account for the majority of annual inventory flows, comprising 73.6 percent of net growth, 75.9 percent of harvest removals, and 63.9 percent of mortality. Harvest removals are concentrated on state and local lands, which account for about 52.1 percent of total removals, followed by private lands at about 38.2 percent and National Forest lands at about 9.5 percent. Overall, these statewide indicators suggest that Minnesota's growing-stock inventory remains in a condition of positive net growth.

Table 1: Characteristics of Growing Stock in Minnesota, 2023. [†]

Description	Species group	National Forest	Other federal	State and local	Private	Not available	Total
Net volume	Hardwood	24,940	3,813	60,421	115,848	0	205,021
	Softwood	26,771	1,625	36,969	30,811	0	96,176
	Total	51,711	5,437	97,390	146,659	0	301,197
Average annual net growth	Hardwood	636	80	1,938	2,986	8	5,647
	Softwood	432	51	804	736	2	2,024
	Total	1,067	130	2,742	3,722	10	7,671
Average annual harvest removals	Hardwood	147	3	1,191	922	0	2,262
	Softwood	137	1	363	219	0	721
	Total	284	4	1,554	1,140	0	2,982
Average annual mortality	Hardwood	380	48	825	1,282	0	2,535
	Softwood	427	15	550	440	0	1,433
	Total	807	63	1,375	1,722	0	3,967

[†] All amounts are in thousands of standard cords.

Note: Original FIA estimates reported in cubic feet were converted to standard cords using a conversion factor of **79 cubic feet per standard cord**. **Growing stock** is all live trees of commercial species that meet minimum merchantability standards. **Net volume** is net volume in cubic feet of growing stock for timber species, for trees greater than or equal to five inches in diameter, from a one-foot stump to a minimum four-inch top diameter, or to where the central stem breaks into limbs, all of which are less than four inches in diameter. **Net growth** is the average annual net growth of growing stock, in cubic feet, on forest land. **Annual mortality** is the average annual cubic foot mortality of live growing-stock trees (at least four inches DBH), in cubic feet, on forest land. **Harvest removals** are the average annual harvest removals, in cubic feet, of growing stock trees on forest land.

Economic contribution of the Forest Product Industries, 2023

The FPIs in this study are defined as 32 IMPLAN industries (only 30 industries present in Minnesota) that were aggregated into seven analytic groups for consistent reporting across the state. This report follows the same industry grouping framework used in the 2017 report, which was originally developed through consultation with state forestry agencies and other stakeholders and represent a working consensus on what constitutes the regional FPI (Leefers et al. 2020; Poudel and Dahal 2025). The complete list of industries and groupings are presented in [Appendix A](#).

The FPI encompasses a wide range of activities that begin with forest management and timber harvesting and extend through the conversion of raw materials into high-value finished goods. These activities include timber tract operations, nurseries, logging, sawmills, wood preservation, pulp and paper manufacturing, furniture production, and related downstream sectors (Poudel and Dahal 2025). The FPI is a cornerstone of the Minnesota economy, not only providing direct employment in logging, milling, and manufacturing but also supporting a much larger network of indirect and induced jobs in transportation, warehousing, wholesale trade, and retail (Leefers et al. 2020). Its health has far-reaching consequences for rural communities, where it is often one of the few sources of year-round employment, and for regional supply chains that depend on steady flows of wood, fiber, and paper products (Lamsal et al. 2025a).

Measuring these contributions requires more than simply counting jobs, mills, or other establishments. Contribution analysis is essentially a descriptive, ex-post accounting framework that traces how industries interact within a regional economy and support the economy (Lamsal et al. 2025b, Watson et al. 2015). It not only measures the direct transactions tied to a sector, but also the indirect effects in supplier industries and the induced effects from household spending that ripple outward. Economic contribution analysis depends on standardized frameworks that can translate government statistics into regional input–output models. The Bureau of Economic Analysis (BEA) provides the foundation through its Benchmark Input-Output Accounts, which map the flow of goods and services across industries and establish the structure of GDP by industry (BEA 2023). The Bureau of Labor Statistics (BLS) complements this with the Quarterly Census of Employment and Wages (QCEW) and occupational data, which provide details on employment and payroll. Further, the U.S. Census Bureau adds extra detail with the Economic Census and County Business Patterns, which track establishments, receipts, and industry-level production. IMPLAN harmonizes these data sources into a consistent input-output modeling framework for estimating regional economic contributions (IMPLAN 2023). IMPLAN is widely used in forest-sector economic research to estimate employment, output,

labor income, and value-added effects associated with forest-products industries. Several forest-sector studies have also paired IMPLAN with FIA data to link forest resource conditions with regional economic outcomes, including timber-product output in Ohio (Coronado et al. 2014), domestic hardwood substitution for imported trailer decking in New York (Pokharel et al. 2023), and potential mass timber processing facility development in Michigan (Khanal et al. 2024). IMPLAN also provides a bridge table that is important for defining the forest-products sectors included in this report. The bridge table is useful in both directions: it aggregates NAICS industries into IMPLAN sectors for modeling and identifies the NAICS components represented within each IMPLAN sector. Although this does not by itself constitute a formal sector disaggregation within IMPLAN, it provides the basis for constructing partial-sector estimates when external data are available.

This distinction is particularly important for forest sector analysis because several IMPLAN sectors contain both forestry and non-forestry components (Poudel and Dahal 2025). In this study, the IMPLAN bridge table was used to identify the relevant NAICS-defined activities embedded within broader IMPLAN sectors, and external data were then used to approximate the forest-related share of selected mixed sectors. For example, IMPLAN Sector 10 (All Other Crop Farming) includes a wide variety of agricultural activities such as alfalfa, peanut, and hemp farming, also in addition to maple syrup production. Using USDA maple syrup production data, only the maple syrup portion of Sector 10 was included in the FPI. Similarly, IMPLAN Sector 19 (Support Activities for Agriculture and Forestry) encompasses a broad spectrum of NAICS industries, including soil preparation, crop harvesting, farm labor contracting, and specialized support services for forestry. To avoid overstating the sector, only Support Activities for Forestry were retained in the FPI totals, using BLS employment and establishment data. Thus, the partial-sector estimates reported here reflect analyst-defined allocations based on the IMPLAN bridge table and supplementary data, rather than an automatic sector split performed within IMPLAN. In the 2017 report, several additional sectors were treated as partial sectors, IMPLAN 40 (Electric Power Generation, Biomass), IMPLAN 352 (Institutional Furniture Manufacturing), and IMPLAN 356 (Showcase, Partition, Shelving, and Locker Manufacturing), but in 2023, following stakeholder consensus and due to limited data to isolate wood-based components, these are treated as full sectors; consequently, the 2023 economic contribution estimates for these specific sectors appear higher and are not directly comparable to the 2017 figures. Any comparison between years should therefore be interpreted with caution.

Further, the 2023 analysis implemented the mixed endogenous-exogenous closure using the Output- and Employment -based multipliers formulation approach (Miller and Blair 2022; Lamsal et al. 2025a), whereas the 2017 report used the equivalent matrix-inversion approach. Since these approaches are alternative computational expressions of the same input-output

framework and, under the same closure assumptions, these formulations are theoretically equivalent and yield the same multipliers and results.

Note on Data Consistency (2017 vs. 2018–2023): Readers should interpret the sharp variance between 2017 and 2018 data with caution. The 2017 figures presented in this report are retained from previous studies that used the desktop-based IMPLAN Pro software. Data for 2018 through 2023 were generated using the modernized IMPLAN Cloud (Web) platform, which utilizes updated accounting frameworks and regional purchase coefficients. Although both sets of estimates are based on the same underlying input–output/SAM framework, they are not fully comparable in construction. IMPLAN revised its industry classification structure over time, moving from the 536-industry scheme used for 2013–2017 data years to the 546-industry scheme used for 2018–2022, and later to the 528-industry scheme beginning in 2023. IMPLAN also documents differences in trade-flow and regional purchase coefficient estimation between legacy Pro-era workflows and the current cloud environment. In addition, this report applies updated aggregation and sector-inclusion rules for selected forest-related industries. Accordingly, differences between 2017 and later years may reflect methodological discontinuity in addition to underlying economic change. Comparisons spanning 2017 to 2018 should therefore be interpreted with caution.

Economic Performance Trends of Forest Product Industry (2017-2023)

Figures 4 and 5 illustrate the economic trajectory and structural resilience of Minnesota’s Forest Sector over the seven-year study period. As shown in Figure 4, Minnesota forest industry is characterized by significant workforce stability and a distinct "U-shaped" recovery. Following a pandemic-era low in 2020, Direct Employment rebounded strongly, climbing back to 33,991 jobs in 2023, effectively matching 2017 levels (34,055). Real Industry Output followed a slightly more complex path; while it experienced a dip in 2022, it surged by over \$900 million between 2022 and 2023. This recent momentum shows that the sector has successfully navigated supply chain disruptions and is returning to full capacity, with output levels (\$12.89 billion) stabilizing near the seven-year average.

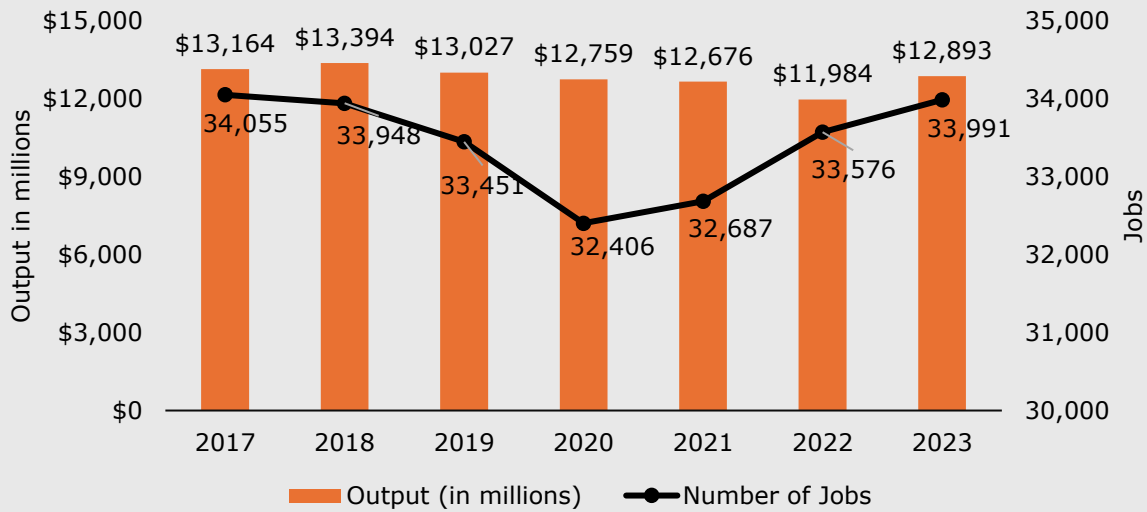


Figure 4: Direct output and employment, 2017–2023, Minnesota state forest products industries.

Figure 5 highlights the sector's efficiency in generating wealth for the state economy. A key technical divergence is visible here: while gross Output declined slightly by 2.1% over the full period, Real Value Added, the sector's net contribution to Gross State Product (GSP), actually increased by 2.2%, rising to \$4.47 billion in 2023. This inverse relationship indicates an improvement in "value-added intensity." The industry is effectively generating more economic value per unit of production, likely driven by efficiencies in processing or a favorable shift in the cost of intermediate inputs. Meanwhile, Labor Income has remained relatively flat in real terms, decreasing slightly by 2.6% over the seven years.

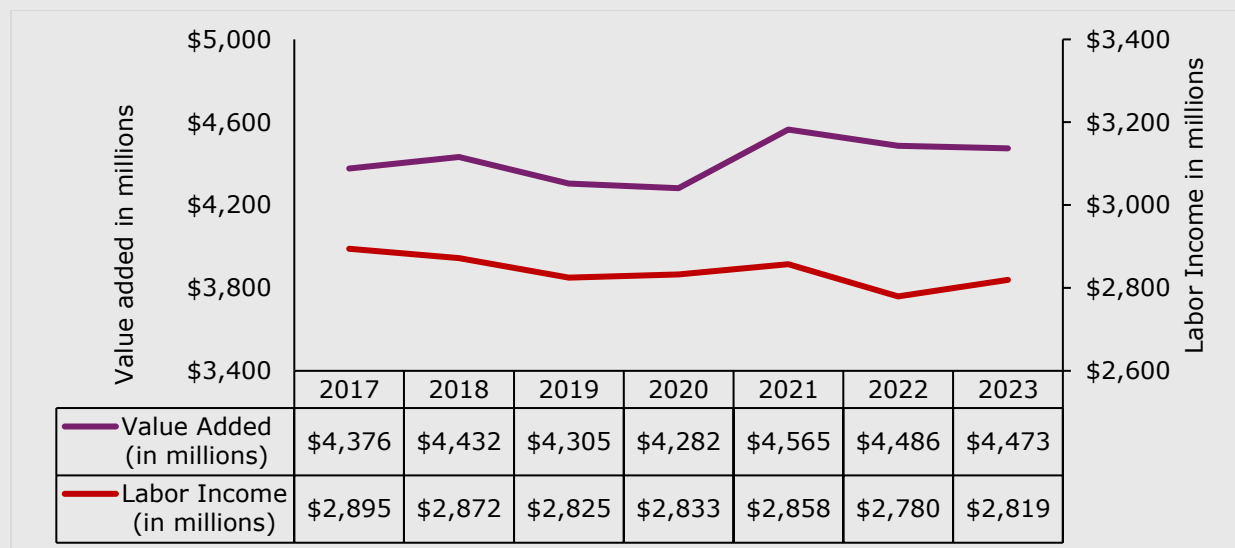


Figure 5: Direct value-added and labor income, 2017–2023, Minnesota state, forest products industries.

Direct and Total Contributions by Forest Product Industry Groups

In 2023, Minnesota’s forest products industries directly employed 33,991 individuals, generated \$12.89 billion in output, and contributed approximately \$4.47 billion in value-added to the state economy (Table 2). The sector’s aggregate influence on the broader regional economy remains substantial. When accounting for indirect supply-chain transactions and induced household spending, the total economic contribution of the forest sector reached to 71,198 jobs and \$21.26 billion in total output.

Table 2: Statewide Economic Contribution of Forest Products Industries, 2023. [†]

	Employment	Labor Income	Value-added	Output
Direct in 2023	33,991	\$2,819,364	\$4,473,392	\$12,892,856
Compared to 2017	-0.2%	-2.6%	2.2%	-2.1%
Total in 2023	71,198	\$5,684,894	\$9,301,219	\$21,262,978
Compared to 2017	-9.3%	-8.8%	-3.6%	-5.9%
Multipliers in 2023	2.09	2.02	2.08	1.65

[†] All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.

Comparing the 2023 results with 2017 reveals a notable divergence between the core industry and its broader economic ripple effects. While direct employment remained remarkably stable with a negligible decline of 0.2%, the total employment impact contracted by 9.3%. This disparity implies that while the primary forest industries successfully maintained their workforce, the supporting supply chains or service sectors dependent on them have seen reduced activity or consolidation.

The calculated multipliers further show the sector’s deep integration into Minnesota’s economy. The employment multiplier of 2.09 is particularly robust, indicating that for every 100 direct jobs in the forest industry, an additional 109 jobs are supported in other sectors. Similarly, the Value-Added multiplier of 2.08 suggests that every dollar of wealth created directly by forest industries generates an additional \$1.08 elsewhere in the state. These high multipliers reflect extensive local supply chain linkages and suggest that the forest sector serves as a critical economic anchor, driving significant activity in transportation, manufacturing, and service sectors throughout the state.

Table 3 reports the direct economic contributions of the seven industry groups, while Table 4 expands this view to include total contributions with multiplier effects. In 2023, Minnesota’s forest sector structure is heavily weighted toward downstream manufacturing rather than raw

extraction. Unlike regions where forestry and logging dominate the workforce, Minnesota’s employment is concentrated in value-added production. The Secondary Solid Wood Products sector is the clear labor leader, directly employing 13,144 individuals, nearly four times the combined workforce of the Forestry and Logging sectors (2,849 jobs). This suggests a mature industrial ecosystem where raw timber is not just harvested but extensively processed within the state into higher-value commodities like engineered wood, windows, and cabinetry.

A stark divergence in capital intensity is evident when comparing sectors. While Wood Furniture requires a substantial labor force (8,442 jobs) to generate \$1.81 billion in output, the Pulp, Paper, and Paperboard Mills sector generates even higher output (\$1.93 billion) with only 2,109 workers. This indicates that the paper manufacturing sub-sector is highly automated and capital-intensive, generating significantly higher output per worker compared to other manufacturing or logging operations.

Table 3: Direct Economic Contributions in Minnesota state, Industry Groups, 2023. [†]

Industries	Employment	Labor Income	Value-Added	Output
1.Forestry	978	\$35,267	\$39,310	\$43,439
2.Logging	1,871	\$70,447	\$75,636	\$83,302
3.Primary Solid Wood Products	1,311	\$147,024	\$379,343	\$1,088,941
4.Secondary Solid Wood Products	13,144	\$1,181,760	\$1,673,211	\$4,427,072
5.Wood Furniture	8,442	\$588,912	\$676,649	\$1,814,994
6.Pulp, Paper, and Paperboard mills	2,109	\$240,368	\$623,835	\$1,930,470
7.Secondary Paperboard and other Paper Products	6,135	\$555,586	\$1,005,409	\$3,504,639

[†] All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.

When supply-chain and induced effects are integrated (Table 4), Secondary Solid Wood Products remains as the primary economic engine of the state's forest sector, supporting a massive 27,698 total jobs and nearly \$7.6 billion in total economic output. However, the most notable leverage effect is found in the Pulp, Paper, and Paperboard Mills sector. Despite its smaller direct workforce, this sector possesses an exceptionally high employment multiplier of roughly 3.8 (8,082 total jobs supported by 2,109 direct jobs). This reflects deep backward linkages; because paper mills require vast and consistent volumes of wood fiber, energy, and

transportation services, their continued operation sustains a disproportionately large network of loggers, truckers, and utility providers throughout the regional economy.

Note: In Table 4, readers may observe that the sum of the economic contributions for the individual industries exceeds the reported total contribution for the Forest Sector as a whole as presented in Table 2. This difference is intentional and results from the "mixed-model" approach used to ensure accuracy.

In Input-Output (I-O) analysis, simply adding the total contributions of individual sectors results in double-counting. This occurs because the output of one forest industry often serves as an input for another. For example, logs harvested by the Logging sector are inputs for the Furniture sector. If modeled individually and summed, the model counts both the direct value of the logs and the associated supply-chain ripples (indirect effects) twice: once as a production requirement for the Furniture, and again as a direct output of the Logging sector. To provide the most accurate estimate, the aggregated total is calculated by treating the forest industries as a single economic unit. This method mathematically nets out all inter-industry transactions within the sector, ensuring that the final results reflect only the new economic value generated for the state economy.

Table 4: Total Economic Contributions in Minnesota state, Industry Groups, 2023. [†]

Industries	Employment	Labor Income	Value- Added	Output
1.Forestry	1,143	\$46,090	\$58,568	\$74,702
2.Logging	2,237	\$93,556	\$115,988	\$148,049
3.Primary Solid Wood Products	4,447	\$372,484	\$756,139	\$1,767,561
4.Secondary Solid Wood Products	27,698	\$2,271,575	\$3,502,772	\$7,597,779
5.Wood Furniture	15,259	\$1,097,690	\$1,533,387	\$3,320,446
6.Pulp, Paper, and Paperboard mills	8,082	\$711,935	\$1,409,138	\$3,352,587
7.Secondary Paperboard and other Paper Products	16,127	\$1,339,759	\$2,416,001	\$5,900,947

[†] All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars.

Forestry

Economic Contribution of Forestry

Table 5 presents the economic contribution of the Forestry sector. For Minnesota, this group aggregates two primary industries: (1) timber tract operations, which involve the management

of forest lands for the sale of standing timber; and (2) support activities for forestry. As noted previously, the maple syrup production industry is not present, or is not disclosed in the Minnesota’s dataset. Consequently, this sector’s activity is driven by the foundational work of timber cruising, reforestation, wildland firefighting, and forest economics consulting, services that are essential for maintaining the commercial viability and health of the state’s timber base.

Table 5: Direct, Indirect, and Induced Economic Contributions of the Forestry Industry in Minnesota, 2023. [†]

	Employment	Labor Income	Value-Added	Output
Direct	978	\$35,267	\$39,310	\$43,439
Indirect	5	\$440	\$731	\$1,397
Induced	160	\$10,383	\$18,526	\$29,866
Total	1,143	\$46,090	\$58,568	\$74,702

[†] All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars.

In 2023, the Forestry sector directly supported 978 jobs and generated \$43.4 million in direct output. While this sector provides the biological raw material for the rest of the forest economy, its financial structure is distinct from the downstream manufacturing sectors. The data indicates an exceptionally labor-intensive industry where the vast majority of gross output is allocated to the workforce rather than to equipment or intermediate supplies. Specifically, nearly 81% of the sector’s direct output flows to Labor Income (\$35.3 million out of \$43.4 million).

This heavy reliance on labor rather than physical inputs dictates the sector’s unique multiplier effects. The employment multiplier is approximately 1.17, meaning that for every 100 jobs in Forestry, roughly 17 additional jobs are supported elsewhere in the state. Decomposing this multiplier highlights that the sector’s economic ripples are driven almost exclusively by workforce spending (induced effects) rather than business supply chains (indirect effects).

- **Indirect Effect:** The sector generated negligible indirect impacts, supporting only 5 jobs and roughly \$1.4 million in output. This reflects the land-intensive nature of timber growing; unlike a manufacturing industry like paper mill that constantly purchases chemicals and energy, forestry operations have minimal business-to-business purchasing requirements.
- **Induced Effect:** In contrast, the induced effect supported 160 jobs and \$29.9 million in output. Because such a high percentage of the sector’s output is retained as labor income, the primary economic contribution beyond the forest itself arises when foresters and loggers spend their earnings within their local communities.

When these effects are combined, the Forestry industry contributed a total of 1,143 jobs, \$74.7 million in output, and \$58.6 million in value-added to the Minnesota economy in 2023. The

total output multiplier of 1.72 implies that every \$100 of output generated by forest management activities generates an additional \$72 of economic activity throughout the state.

Trend Analysis: Forestry (2017–2023)

As illustrated in Figure 6, the Forestry industry in Minnesota displays a distinct "U-shaped" recovery trajectory following a contraction during the covid-19 pandemic. After hitting a seven-year low in 2020 with 715 jobs and \$33.8 million in output, the sector has experienced a robust rebound. The most striking trend appears in the final year. Direct employment surged by nearly 17% between 2022 and 2023, climbing from 836 to a period high of 978 workers. This 2023 employment level significantly exceeds the 2017 baseline of 782 jobs. However, the financial recovery has not kept pace with this workforce expansion. While output rebounded from its 2020 lows to reach \$43.5 million in 2023, it remains slightly below the 2017 peak of \$44.3 million. The substantial 25% increase in workforce over the seven-year period, paired with flat real output, suggests a decline in average labor productivity.

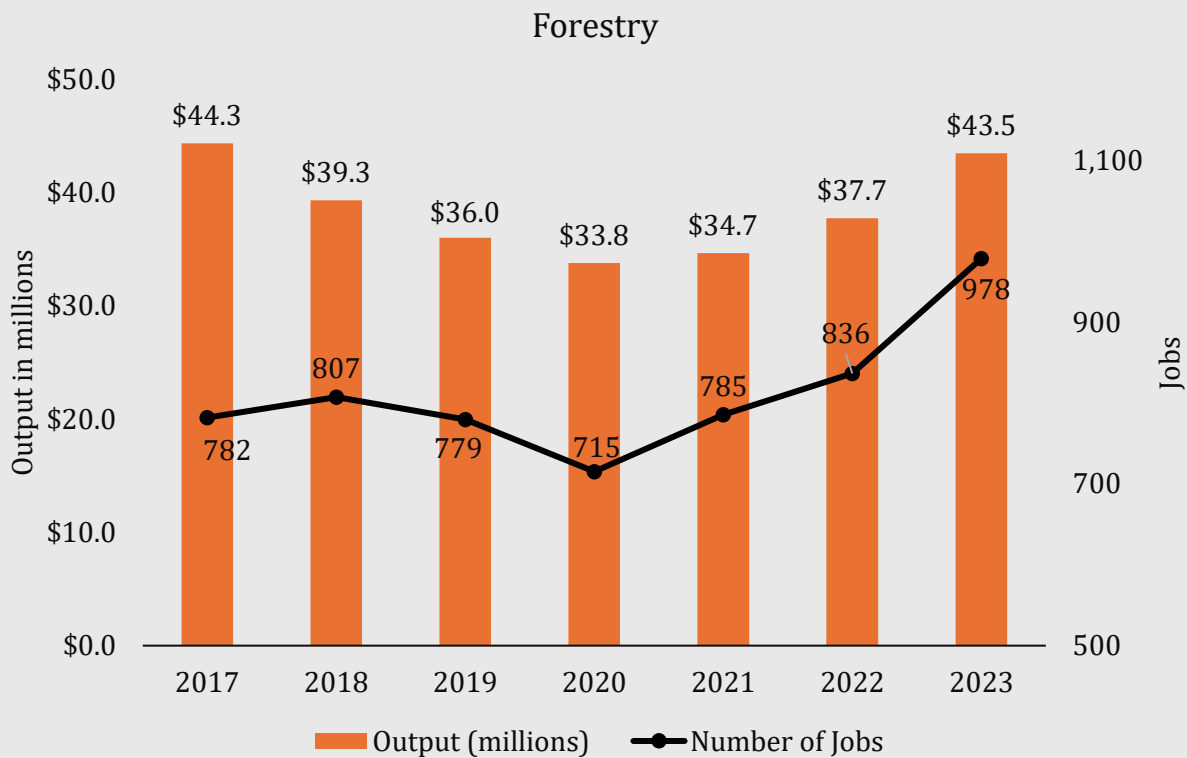


Figure 6: Trend in direct employment and output for the Forestry industry in Minnesota, 2017–2023.

Logging

Economic Contribution of Logging

Table 6 outlines the economic contributions of the Logging sector, which comprises establishments primarily engaged in cutting timber, transporting logs, and producing wood chips in the field. In 2023, this sector served as a critical source of rural employment in Minnesota, directly supporting 1,871 jobs. The industry generated \$83.3 million in direct output and contributed \$75.6 million in Value-Added to the state's economy.

The multiplier analysis characterizes Logging as a sector driven by high labor intensity rather than complex intermediate supply chains. A distinctive economic feature here is the dominant role of household spending over business-to-business transactions. At \$60.4 million, output from induced effects was markedly higher than the \$4.3 million generated through indirect effects. This disparity is based on the sector's unique cost structure, where a substantial 84.6% of Logging's direct output is allocated to Labor Income (\$70.4 million out of \$83.3 million). Because such a vast proportion of the industry's revenue is distributed as employee compensation and proprietor income to local workers or employees, the subsequent re-spending of that income acts as a powerful accelerator for the local economy. Conversely, the relatively low Indirect effect reflects a supply chain limited primarily to fuel, heavy equipment maintenance, and stumpage fees rather than processed manufacturing inputs.

When these direct, indirect, and induced impacts are aggregated, the Logging industry contributed a total of 2,237 jobs, \$148.0 million in output, and \$116.0 million in value-added to the Minnesota economy. The implied Output Multiplier is 1.78, indicating that for every dollar of timber harvested, an additional \$0.78 of economic activity is stimulated elsewhere in the state. This represents a stronger economic ripple effect than the Forestry sector (1.72), primarily due to the higher volume of labor income circulating back into local communities.

Table 6: Direct, Indirect, and Induced Economic Contributions of the Logging Industry in Minnesota, 2023. [†]

	Employment	Labor Income	Value-Added	Output
Direct	1,871	\$70,447	\$75,636	\$83,302
Indirect	43	\$2,102	\$2,863	\$4,312
Induced	323	\$21,006	\$37,489	\$60,436
Total	2,237	\$93,556	\$115,988	\$148,049

[†] All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars.

Trend Analysis: Logging (2017–2023)

As shown in Figure 7, the Logging industry in Minnesota experienced a consistent contraction in both employment and output throughout the entire seven-year study period.

Direct employment saw a steady, year-over-year decline. The number of jobs fell from 2,495 in 2017 to 1,871 in 2023. This represents a significant net loss of 624 jobs, or approximately 25% of the sector's workforce over the period. Similarly, the direct output exhibited high volatility but followed a steep downward trajectory. Output dropped sharply from \$176.7 million in 2017 to a low of \$97.8 million in 2019. While there were brief recoveries in 2020 and 2021, the sector ultimately ended the period at \$83.3 million in 2023. The dramatic drop in output, paired with a significant decline in employment, indicates sustained pressure on commodity prices and a structural reduction in the sector's overall economic scale. Overall, the data suggests that the industry is operating at a substantially smaller economic footprint in 2023 than in 2017, which shows the challenges related to market demand, or stumpage availability.

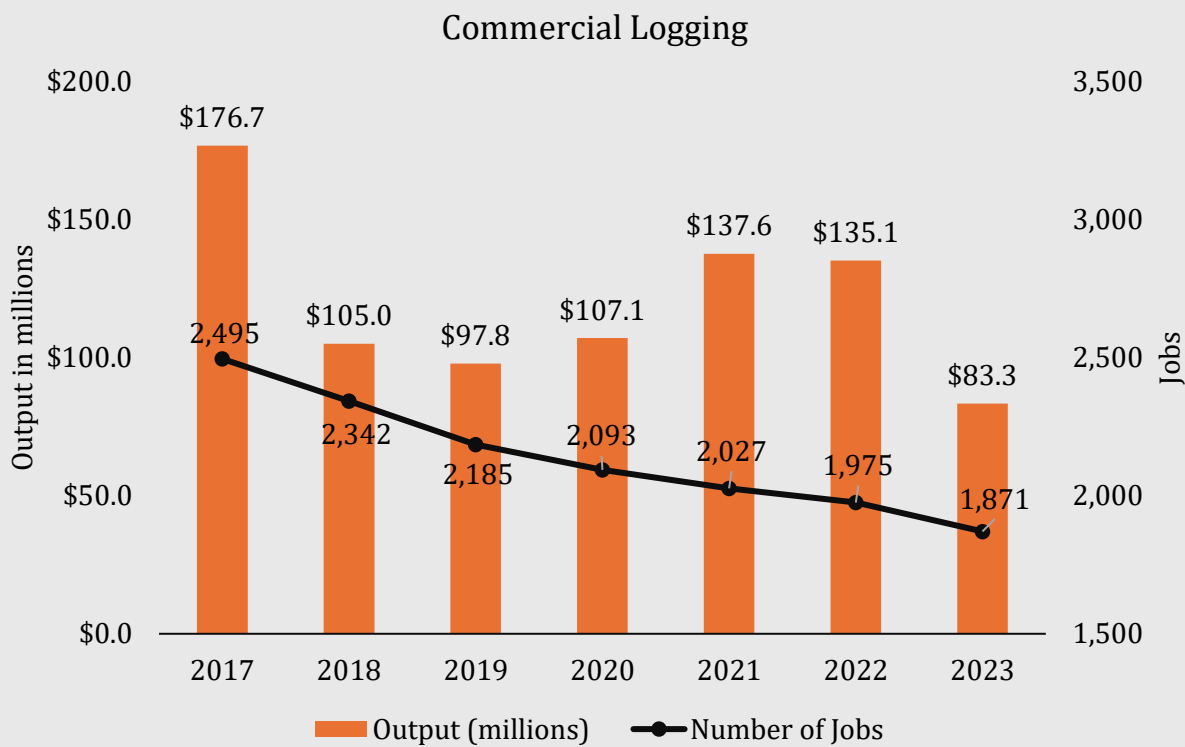


Figure 7: Trend in direct employment and output for the Logging industry in Minnesota, 2017–2023.

Primary Solid Wood Products

Economic Contribution of Primary Solid Wood Products

Table 7 presents the economic contributions of the Primary Solid Wood Products industry. In Minnesota, this sector encompasses a diverse range of manufacturing activities, including wood-based electric power generation (biomass), sawmills, wood preservation, veneer and plywood manufacturing, and reconstituted wood product industries. In 2023, this manufacturing hub directly employed 1,311 workers and generated nearly \$1.09 billion in direct output. Notably, the sector demonstrates robust capital efficiency, contributing \$379.3 million in direct Value-Added, which shows a substantial economic wealth creation as raw timber is processed into construction-grade lumber, structural panels, and treated wood products.

The Primary Solid Wood Products industry exhibits the second most profound backward linkages within the Minnesota forest economy (after Pulp, Paper, and Paperboard mills), acting as a critical demand driver for upstream operations. Unlike the extraction sectors where economic ripples are driven by household spending, this sector's impact is dominated by deep supply chain expenditures. A pivotal structural dynamic is evident in the employment data: the Indirect Employment effect supports 1,846 jobs, a figure that significantly exceeds the sector's own direct workforce of 1,311. This results in an exceptionally high Employment Multiplier of 3.39. Essentially, for every 100 direct jobs in primary wood manufacturing, an additional 239 jobs are supported elsewhere in the state economy. This underscores the sector's function as a "keystone" industry; its operational demands single-handedly sustain a vast network of loggers, truckers, and maintenance contractors who would otherwise lack a consistent market.

When aggregating direct, indirect, and induced effects, the Primary Solid Wood Products industry contributed a total of 4,447 jobs, \$1.77 billion in output, and \$756.1 million in value-added to the state economy in 2023. By supporting nearly 4,500 jobs statewide, this industry anchors the regional forest value chain, effectively transforming natural resources into widespread economic activity across Minnesota's rural and industrial communities.

Table 7: Direct, Indirect, and Induced Economic Contributions of the Primary Solid Wood Products Industry in Minnesota, 2023. [†]

	Employment	Labor Income	Value-Added	Output
Direct	1,311	\$147,024	\$379,343	\$1,088,941
Indirect	1,846	\$141,733	\$227,392	\$437,800
Induced	1,289	\$83,727	\$149,404	\$240,821
Total	4,447	\$372,484	\$756,139	\$1,767,561

[†] All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars.

Trend Analysis: Primary Solid Wood Products (2017–2023)

As shown in Figure 8, the Primary Solid Wood Products industry in Minnesota demonstrates a classic case of capital deepening and efficiency gains. Over the seven-year period, the sector exhibits a clear divergence between output and labor requirements. While direct employment declined by approximately 12% (falling from 1,489 jobs in 2017 to 1,311 in 2023), Real Industry Output increased by over 20%, rising from \$902.7 million to nearly \$1.09 billion.

The sector displayed significant volatility during the post-pandemic period. Output surged to a peak of \$1.12 billion in 2021, before correcting sharply in 2022. However, the recovery in 2023 was robust. Between 2022 and 2023, output jumped by roughly \$200 million (a 22.4% increase), yet employment only increased by a modest 3.1% (40 jobs). This pattern suggests that Minnesota’s sawmills and wood manufacturing facilities are now generating significantly more value per worker than they could at the start of the study period.

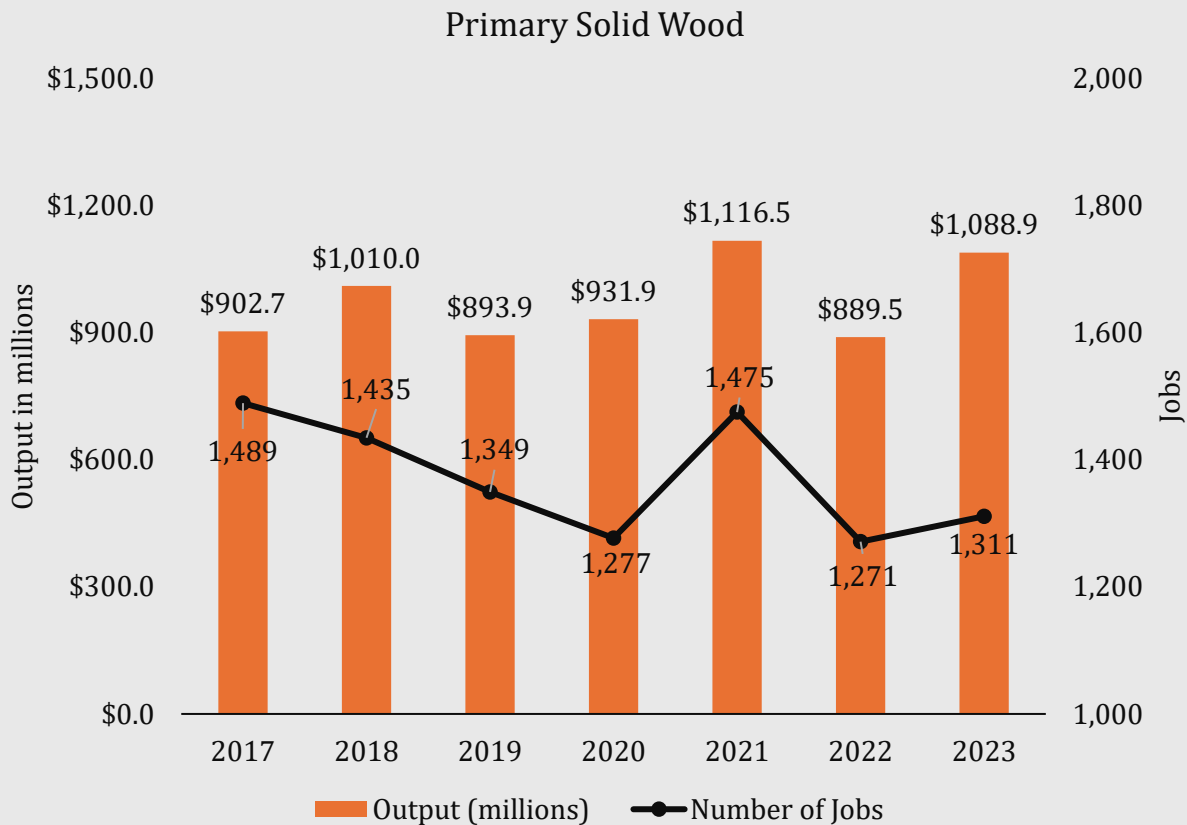


Figure 8: Trend in direct employment and output for the Primary Solid Wood Products industry in *Minnesota*, 2017–2023.

Secondary Solid Wood Products

Economic Contribution of Secondary Solid Wood Products

Table 8 presents the economic contribution of the Secondary Solid Wood Products industry. This diverse value-added sector encompasses industries such as engineered wood member and truss manufacturing, wood windows and doors manufacturing, millwork and flooring, wood container and pallet manufacturing, prefabricated wood building manufacturing, and miscellaneous wood product manufacturing. In 2023, this sector stood as the largest direct employer within the Minnesota forest economy, directly employing 13,144 workers and generating nearly \$4.43 billion in direct output.

The sector exhibits a healthy employment multiplier of 2.11, indicating that for every 100 jobs created in secondary manufacturing, roughly 111 additional jobs are supported elsewhere in the Minnesota economy. While robust, this multiplier is notably lower than that of the Primary Solid Wood sector (3.39). This distinction reflects upstream supply chain dynamics: whereas Primary manufacturers rely on labor-intensive logging operations for raw inputs, Secondary manufacturers primarily purchase processed lumber from capital-intensive sawmills or import intermediate wood components. Consequently, the Indirect Employment effect (6,692 jobs) is roughly half the size of the direct workforce, contrasting sharply with the Primary sector where the indirect workforce significantly exceeded the direct workforce.

When fully aggregated, the sector supports a total of 27,698 jobs and contributes nearly \$7.60 billion in total economic output. Financially, the sector acts as an effective value multiplier, contributing a total of \$3.50 billion in Value-Added to the GSP. This group exhibits a high degree of value retention, consistent with its focus on converting rough lumber into finished construction components and specialized wood products. Correspondingly, the ratio of direct value added to output in this sector is 37.8%, exceeding the 34.8% observed in the Primary sector.

Table 8: Direct, Indirect, and Induced Economic Contributions of the Secondary Solid Wood Products Industry in Minnesota, 2023. [†]

	Employment	Labor Income	Value-Added	Output
Direct	13,144	\$1,181,760	\$1,673,211	\$4,427,072
Indirect	6,692	\$579,338	\$918,533	\$1,702,463
Induced	7,862	\$510,476	\$911,029	\$1,468,245
Total	27,698	\$2,271,575	\$3,502,772	\$7,597,779

[†] All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars.

Trend Analysis: Secondary Solid Wood Products (2017–2023)

As illustrated in Figure 9, the Secondary Solid Wood Products industry stands out as the consistent growth engine of Minnesota's forest economy. Unlike the upstream sectors that faced contraction or volatility, this value-added sector experienced a steady and robust expansion in both capacity and financial performance throughout the seven-year period. Employment growth has been remarkably consistent. The sector added jobs in nearly every year of study (except 2018-2020), rising from 11,288 workers in 2017 to a peak of 13,144 in 2023. This represents a net workforce expansion of 16.4%, signaling that this industry is effectively absorbing labor shedding from the extraction sectors.

Financially, the sector concluded the period with a dramatic surge. While real output hovered between \$3.3 billion and \$3.8 billion for the first six years, it spiked by nearly \$670 million between 2022 and 2023 to reach a record \$4.43 billion. This 17.8% year-over-year jump suggests a significant strengthening in market demand for finished construction components, such as windows, doors, and engineered wood, potentially driven by a localized boom in residential or commercial construction activity.

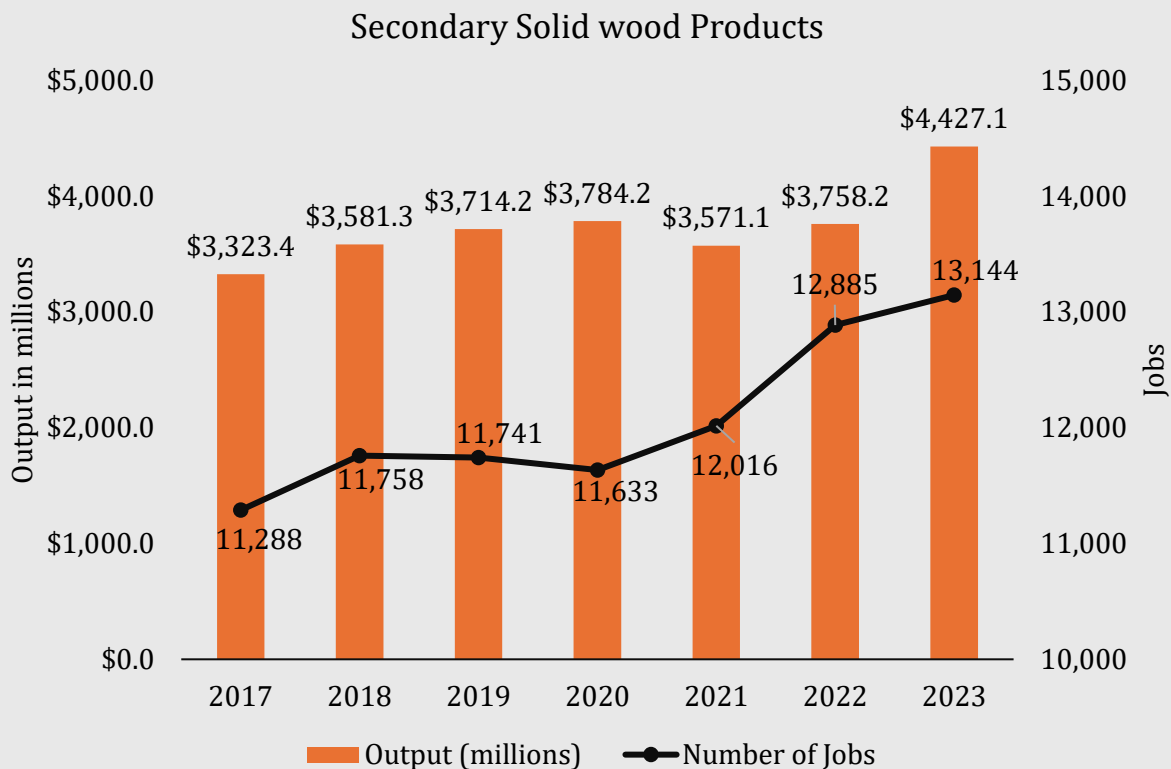


Figure 9: Trend in direct employment and output for the Secondary Solid Wood Products industry in Minnesota, 2017–2023.

Wood Furniture

Economic Contribution of Wood Furniture

Table 9 details the economic contributions of the Wood Furniture industry. This group encompasses a wide range of value-added manufacturers, including those producing wood kitchen cabinets and countertops, non-upholstered household furniture, institutional wood furniture, wood office furniture, and custom architectural woodwork. (Note: Data for upholstered household furniture manufacturing is not disclosed or present in the Minnesota forest economy). In 2023, this sector directly employed 8,442 workers and generated nearly \$1.81 billion in direct output.

Table 9: Direct, Indirect, and Induced Economic Contributions of the Wood Furniture Industry in Minnesota, 2023. [†]

	Employment	Labor Income	Value-Added	Output
Direct	8,442	\$588,912	\$676,649	\$1,814,994
Indirect	3,023	\$262,396	\$416,999	\$796,583
Induced	3,793	\$246,382	\$439,740	\$708,870
Total	15,259	\$1,097,690	\$1,533,387	\$3,320,446

[†] All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars.

The data highlights that Wood Furniture manufacturing operates with a distinct economic structure compared to the upstream processing sectors. While it is a manufacturing industry, it retains a significant labor component relative to its output. Approximately 32% of its direct gross output flows to workers as Labor Income (\$588.9 million out of \$1.81 billion). This ratio underscores the "craft" aspect of the industry, particularly in cabinetry and custom millwork, where the production of high-value goods relies heavily on skilled joinery and assembly rather than purely automated throughput.

This workforce dynamic heavily influences the sector's multiplier effects. The Employment Multiplier is 1.81, meaning that every 100 direct jobs support an additional 81 jobs elsewhere in the state. Notably, the Induced Employment effect (3,793 jobs) exceeds the Indirect Employment effect (3,023 jobs). This signals that the sector's primary leverage on the state economy is derived from the wages, salaries, benefits, and proprietor income paid to its workforce, who subsequently spend that income in the local service economy, rather than from the industry's demands on the industrial supply chain.

When fully aggregated, the Wood Furniture industry contributed a total of 15,259 jobs, \$3.32 billion in output, and \$1.53 billion in value-added to the Minnesota economy in 2023. While it generates less total output than the Secondary Solid Wood Products sector, it remains a vital

pillar of the state's value-added manufacturing base, effectively converting processed lumber into high-value consumer and industrial goods.

Trend Analysis: Wood Furniture Industry (2017–2023)

As shown in Figure 10, the Wood Furniture industry in Minnesota is characterized by exceptional stability and resilience. Unlike the extraction sectors that faced sharp contractions or the secondary wood sector that saw rapid expansion, the furniture sector maintained a consistent operational baseline throughout the study period.

Direct employment remained relatively flat over the seven-year timeline. It peaked at 8,786 jobs in 2019 before experiencing a pandemic-induced contraction in 2020. By 2023, employment stood at 8,442 jobs. This represents a minor 1.5% decline from the 2017 level of 8,575 jobs. This stability suggests a mature industry with a steady demand for its products, capable of retaining its core workforce even during broader economic fluctuations. Financially, the sector has demonstrated modest growth. Real industry output increased by roughly 2.0% over the period, rising from \$1.78 billion in 2017 to \$1.82 billion in 2023. A key structural trend visible here is the subtle but persistent increase in labor productivity. While the workforce contracted slightly, the total output expanded. Consequently, the real output per worker increased from approximately \$207,500 in 2017 to \$215,000 in 2023. This shows that Minnesota’s furniture manufacturers are successfully leveraging incremental efficiency gains or shifting toward higher-margin product lines to maintain revenue despite a tighter labor market.

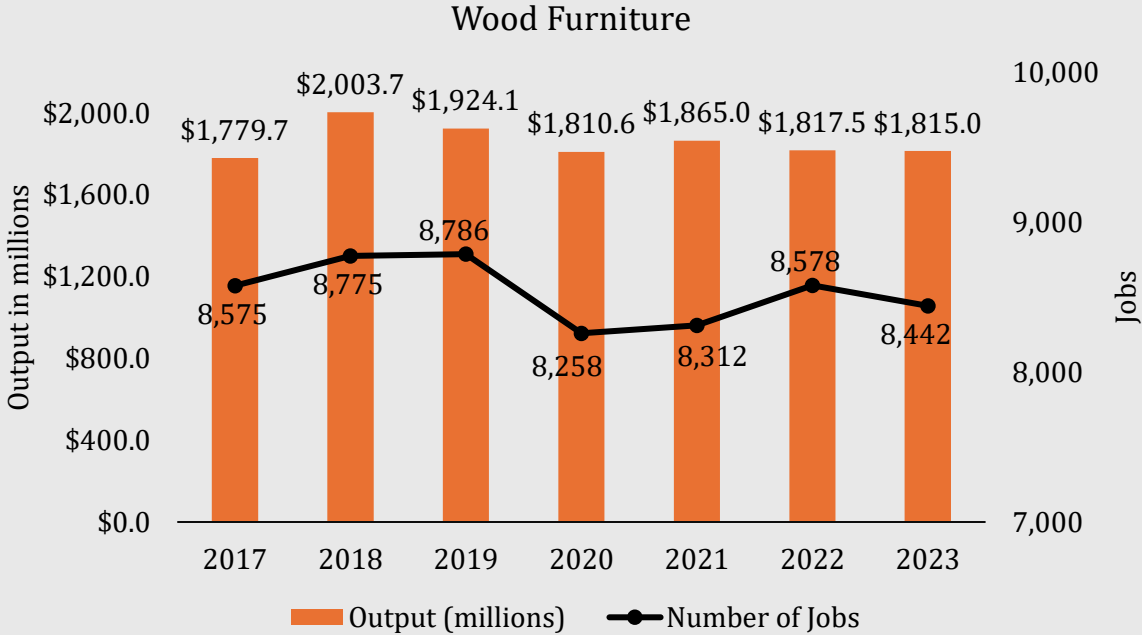


Figure 10: Trend in direct employment and output for the Wood Furniture industry in Minnesota, 2017–2023.

Pulp, Paper, and Paperboard Mills

Economic Contribution of Pulp, Paper, and Paperboard Mills

Table 10 details the economic contribution of the Pulp, Paper, and Paperboard Mills industry. In the context of Minnesota, this sector is highly integrated, encompassing Pulp Mills, Paper Mills, and Paperboard Mills. This sector remains the most capital-intensive component of the state's forest economy, exhibiting an "inverted" employment profile where output is exceptionally high relative to the direct workforce.

Table 10: Direct, Indirect, and Induced Economic Contributions of the Pulp, Paper, and Paperboard Mills Industry in Minnesota, 2023. [†]

	Employment	Labor Income	Value-Added	Output
Direct	2,109	\$240,368	\$623,835	\$1,930,470
Indirect	3,485	\$309,991	\$496,912	\$957,313
Induced	2,488	\$161,576	\$288,392	\$464,804
Total	8,082	\$711,935	\$1,409,138	\$3,352,587

[†] All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars.

In 2023, these highly automated mills generated substantial financial flows despite a relatively small direct workforce. While directly employing 2,109 workers, the sector generated over \$1.93 billion in Direct Output. This divergence between low headcount and high output is the hallmark of advanced automation and high-value, continuous process manufacturing. The sector's direct Value-Added (\$623.8 million) significantly exceeds its direct Labor Income (\$240.4 million), underscoring that capital investment, and the high cost of maintenance, energy, and raw materials, is the primary driver of operational expenditure, not labor.

A defining characteristic of this industry is its function as an economic anchor, where the supply chain workforce far exceeds the workforce inside the facility itself. Specifically, the Indirect Employment (3,485 jobs) is nearly 65% larger than the Direct Employment (2,109 jobs). This shows that mill's intense operational requirements, massive inputs of wood fiber, energy, process chemicals, logistics, and highly technical maintenance services, sustain a much larger external workforce. Consequently, the sector exhibits an extremely powerful Employment Multiplier of 3.83. This is the highest multipliers in the entire forest economy, indicating that every 100 direct mill jobs support an additional 283 jobs elsewhere in the state.

When fully aggregated, the Pulp, Paper, and Paperboard Mills sector supports a total of 8,082 jobs and generates \$3.35 billion in total economic output. Furthermore, the quality of direct employment in this sector is high. With total direct labor income of \$240.4 million distributed among 2,109 workers, the average annual labor income per direct job is approximately

\$114,000, underscoring the industry's role as a critical source of high-income, high-skill technical employment in Minnesota.

Trend Analysis: Pulp, Paper, and Paperboard Mills (2017–2023)

Figure 11 presents a challenging seven-year period for the Pulp, Paper, and Paperboard Mills industry in Minnesota. Unlike the solid wood sectors that experienced periods of recovery or growth, this capital-intensive sector has faced a sustained structural contraction. Both employment and output declined in nearly every year of the study.

Direct employment fell steadily from 2,542 workers in 2017 to 2,109 in 2023. This represents a net workforce reduction of approximately 17%. The financial indicators reveal an even steeper downturn. Real Industry Output decreased by nearly 30% over the same period, dropping from a peak of \$2.74 billion to a low of \$1.93 billion in 2023. This divergence, where revenue is contracting significantly faster than the workforce, points to a decline in realized value per unit of production. In 2017, the average real output per worker was approximately \$1.08 million. By 2023, this figure had decreased to roughly \$0.92 million. This indicates that the industry is facing tough market conditions where income is falling faster than it can reduce its number of employees.

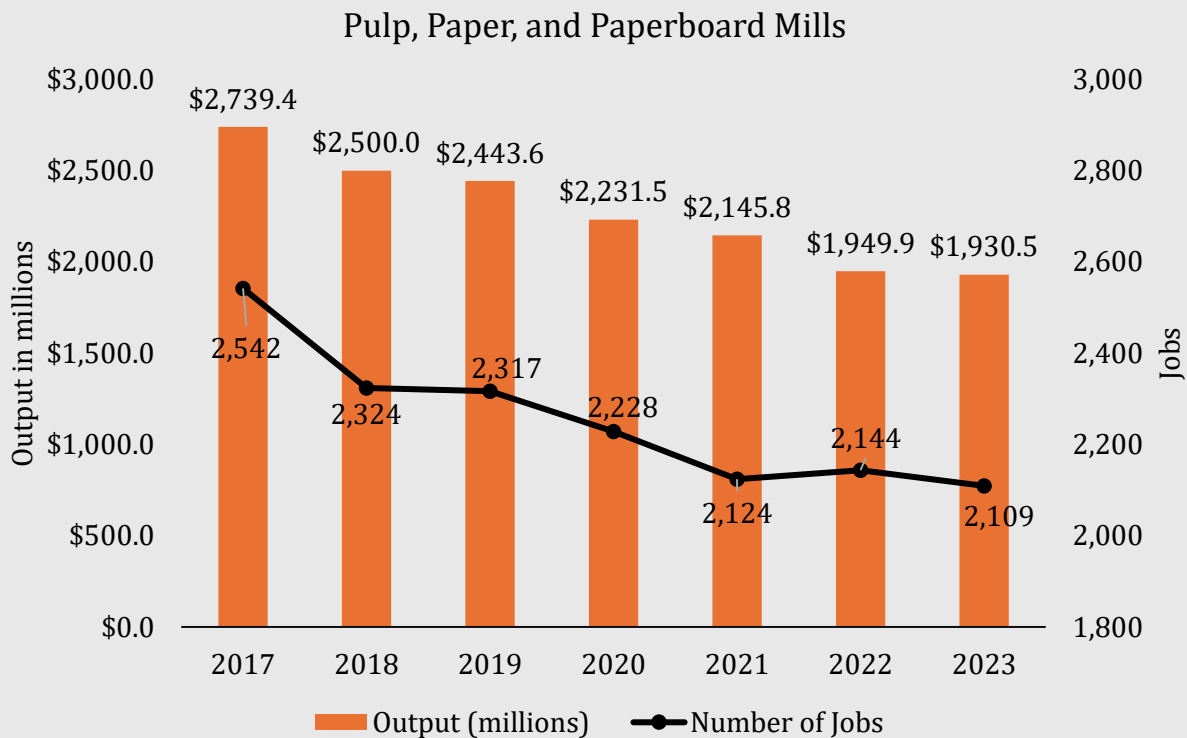


Figure 11: Trend in direct employment and output for the Pulp, Paper, and Paperboard Mills industry in Minnesota, 2017–2023.

Secondary Paperboard and Other Paper Products

Economic Contribution of Secondary Paperboard and Other Paper Products

Table 11 outlines the economic contribution of the Secondary Paperboard and Other Paper Products industry. This group is composed of "converters" that manufacture finished goods from purchased paper, paperboard, or recycled materials, including products like paperboard containers, paper bags, coated paper, stationery, and other specialized paper products. In Minnesota, this sector is a significant component of the forest economy, directly employing 6,135 workers and generating over \$3.50 billion in direct output in 2023.

Table 11: Direct, Indirect, and Induced Economic Contributions of the Secondary Paperboard and Other Paper Products Industry in Minnesota, 2023. [†]

	Employment	Labor Income	Value-Added	Output
Direct	6,135	\$555,586	\$1,005,409	\$3,504,639
Indirect	5,359	\$483,321	\$798,527	\$1,531,020
Induced	4,633	\$300,853	\$612,064	\$865,287
Total	16,127	\$1,339,759	\$2,416,001	\$5,900,947

[†] All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars.

The sector exhibits a robust and highly balanced Employment Multiplier of 2.63, meaning that for every 100 direct jobs in paper converting, an additional 163 jobs are supported throughout the state economy. A closer examination of the multiplier components reveals that the Indirect Employment effect (5,359 jobs) is only slightly lower than the Direct Employment. This substantial indirect impact suggests that the Minnesota converting facilities maintain strong, complex supply chain linkages, demanding high volumes of intermediate goods, namely paper and paperboard from the state's integrated mills, along with specialized logistics and packaging services.

Furthermore, the Induced Employment effect (4,633 jobs) is nearly as large as the Indirect effect, highlighting the dual nature of this sector's leverage: it drives both industrial purchasing and significant local household spending. This is consistent with the sector's structure as a large-scale manufacturing operation that requires both consistent capital inputs and a sizable, steady workforce.

In terms of total contribution, the Secondary Paperboard and Other Paper Products industry supports a total of 16,127 jobs and contributes \$5.90 billion in total economic output. By generating \$2.42 billion in total Value-Added, this converting sector serves a vital role by transforming the output of the capital-intensive Pulp and Paperboard Mills into specialized

packaging and consumer goods that are essential to the state's broader retail, food processing, and logistics sectors.

Trend Analysis: Secondary Paperboard and Other Paper Products (2017–2023)

Figure 12 illustrates the economic trajectory of the Secondary Paperboard and Other Paper Products industry. This sector, which acts as the downstream converter for the region's paper value chain, experienced a gradual but persistent contraction for the majority of the study period. Between 2017 and 2022, both employment and output steadily declined. Employment fell from a peak of 6,885 jobs to a low of 5,887, while real output decreased from \$4.20 billion to \$3.40 billion. This multi-year downward trend likely mirrors the broader regional contraction seen in the upstream pulp and paper mills.

However, 2023 marks a significant pivot point for the industry. For the first time in the seven-year, the sector posted year-over-year gains in both key metrics. Direct employment rebounded by adding 248 jobs (a 4.2% increase from 2022), bringing the workforce back above the 6,000-job level. Similarly, real industry output recovered by over \$100 million to reach \$3.50 billion.

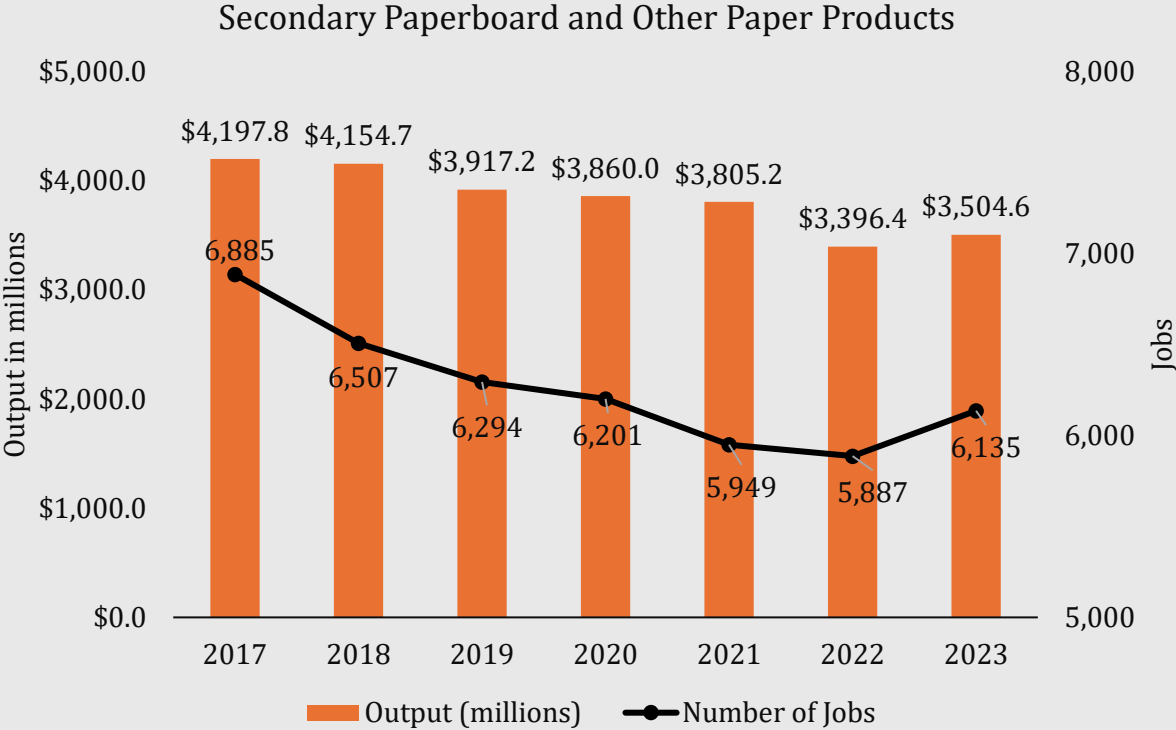


Figure 12: Trend in direct employment and output for the Secondary Paperboard and Other Paper Products industry in Minnesota, 2017–2023.

Top Forest Product Sectors

Minnesota's forest-products sector is represented by 30 IMPLAN industries, as two forest-related sectors, used for the analysis: All other crop farming (Maple syrup production) and Upholstered household furniture manufacturing, are not present or their data is undisclosed in the state's 2023 industry mix. The economic profile of Minnesota's forest sector is distinctively defined by advanced, value-added manufacturing rather than raw extraction. Wood windows and door manufacturing stands as the undisputed economic anchor of the state's forest economy. It ranks first across all four major economic indicators, employing 7,964 workers and generating nearly \$2.72 billion in direct output. This single industry accounts for a significant portion of the sector's total capacity, highlighting Minnesota's specialized strength in the production of high-value construction components.

In terms of employment, the sector is heavily weighted toward secondary solid wood manufacturing. The top two employers are both in this category: Wood windows and door manufacturing followed by Wood kitchen cabinet and countertop manufacturing, which employs 5,190 individuals. Unlike regions where logging or sawmills dominate the workforce, Minnesota's extraction sector plays a smaller direct role in employment rankings; Commercial Logging appears only at rank five with 1,871 jobs. This suggests a mature industrial ecosystem where the primary labor demand comes from processing and finishing wood products rather than harvesting timber.

However, the financial contributions reveal a divergence between labor-intensive and capital-intensive sectors. While Wood kitchen cabinet manufacturing is the second largest employer, it drops to fourth in Value-Added and fifth in Output. In contrast, the paper packaging and processing sectors demonstrate higher capital intensity. Paperboard container manufacturing ranks third in employment but climbs to second place in both Output (\$2.10 billion) and Value-Added (\$546.8 million). Similarly, Paper mills ranks third in Output (\$1.44 billion) and Value-Added (\$476.7 million), despite not appearing in the top five for employment. This indicates that the state's paper and packaging industries generate significantly higher economic value per worker compared to the labor-heavy furniture and cabinetry sectors.

Table 12: Top five industries in terms of direct Economic Contributions in Minnesota state, 2023.

†

Rank	Employment	Labor Income	Value added	Output
1	Wood windows and door manufacturing (7,964)	Wood windows and door manufacturing (\$783,475)	Wood windows and door manufacturing (\$1,097,546)	Wood windows and door manufacturing (\$2,717,523)
2	Wood kitchen cabinet and countertop manufacturing (5,190)	Wood kitchen cabinet and countertop manufacturing (\$347,400)	Paperboard container manufacturing (\$546,827)	Paperboard container manufacturing (\$2,103,216)
3	Paperboard container manufacturing (3,464)	Paperboard container manufacturing (\$309,171)	Paper mills (\$476,729)	Paper mills (\$1,443,183)
4	Paper bag and coated and treated paper manufacturing (2,041)	Paper bag and coated and treated paper manufacturing (\$182,955)	Wood kitchen cabinet and countertop manufacturing (\$415,019)	Paper bag and coated and treated paper manufacturing (\$1,047,981)
5	Commercial logging (1,871)	Paper mills (\$180,255)	Paper bag and coated and treated paper manufacturing (\$346,597)	Wood kitchen cabinet and countertop manufacturing (\$1,019,909)

† All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.

Top Non-Forest Industries supported by the Forest Sector in 2023

In 2023, Minnesota’s economy included 473 IMPLAN sectors outside the forest products industries. The forest sector supported at least one job in 251 industries and at least ten jobs in 160 of those industries. In addition to 33,990 direct jobs, the sector supported 37,207 indirect and induced jobs across the state’s economy. These additional jobs, generated through supply chain purchases and household spending, are heavily concentrated in logistics, wholesale trade, healthcare, and service sectors. Table 13 highlights the top ten non-forest industries most heavily impacted by this economic activity in 2023. Together, these ten sectors account for 12,055 jobs. This represents approximately 32.4 percent of all indirect and induced employment generated by the forest economy.

Table 13: Top Ten Industries Impacted by Minnesota state’s Forest Products Industries in terms of number of jobs in 2023.

Industries	Number of Jobs
Wholesale - Other durable goods merchant wholesalers	1,661
Truck transportation	1,557
Other real estate	1,418
Warehousing and storage	1,257
Hospitals	1,138
Full-service restaurants	1,089
Couriers and messengers	1,036
Employment services	1,007
Limited-service restaurants	965
Management of companies and enterprises	927
Total	12,055

The composition of these top sectors shows the specific mechanisms through which the forest sector stimulates the wider Minnesota economy:

- Logistics and Commercial Trade:** The strongest linkages are found in the movement and wholesale trade of physical goods. Wholesale - Other durable goods merchant wholesalers ranks as the single largest sector, supported by Forest sector, with 1,661 jobs. This reflects the extensive network of lumber yards, building material distributors, and construction suppliers that rely on local wood production. When combined with Truck transportation (1,557 jobs), Warehousing and storage (1,257 jobs), and Couriers and messengers (1,036 jobs), it is evident that the forest sector is one of the primary

drivers of the state's logistics infrastructure. The industry requires a massive, reliable network to transport raw timber from the woods and distribute finished goods to markets.

- **Induced Household Spending:** The prominence of Other real estate (1,418 jobs), Hospitals (1,138 jobs), and dining establishments illustrates the "induced" power of the forest workforce. Full-service restaurants (1,089 jobs) and Limited-service restaurants (965 jobs) are sustained not by mill supply chains, but by the wages and salaries spent by forest-sector employees in their local communities. The high ranking of real estate and healthcare suggests that the salaries paid to loggers, mill workers, and manufacturers are a critical source of revenue for maintaining local housing markets and essential community services.
- **Business Support Services:** Notably, Employment services (1,007 jobs) and Management of companies and enterprises (927 jobs) also appear in the top ten. This indicates that Minnesota's forest product firms are significant consumers of corporate support services. They rely on external firms for administrative oversight, staffing solutions, and organizational management to maintain their operations.

In terms of economic output, the forest sector's influence shifts toward high-volume trade, capital-intensive infrastructure, and core service sectors. As detailed in Table 14, the top ten non-forest industries supported by forest-sector activity generated a combined \$3.14 billion in 2023.

The dominant category involves the wholesale distribution of goods, reflecting the forest industry's reliance on large-scale trade to move high volumes of finished wood and paper products. The leading supported sector is Wholesale - Other durable goods merchant wholesalers, generating over \$620 million in output. When combined with Wholesale - Other nondurable goods merchant wholesalers (\$276.7 million), the wholesale trade sector alone accounts for nearly \$900 million in economic activity supported by the forest industry. This shows the sector's function as a critical source of sales and revenue for commercial trade entities across the state.

The output rankings highlight the substantial capital and infrastructure footprint of the forest economy. Truck transportation ranks third, generating \$344.9 million, underscoring the critical role of freight in the supply chain. Furthermore, Electric power transmission and distribution ranks fourth, contributing \$286.5 million, a large figure driven by the immense electricity consumption of the state's capital-intensive mills and processing facilities.

The presence of Owner-occupied housing as the second-largest supported sector (\$433.2 million) is a significant indicator of the induced effect. In economic modeling, this sector represents the imputed value of homeownership. Its high ranking shows that forest sector jobs,

particularly the high-wage manufacturing roles identified in previous tables, sustain high levels of homeownership and household wealth in Minnesota. This is further supported by the Other real estate sector, which contributed an additional \$267.6 million. Additionally, the sector supports \$243.6 million in output for Hospitals and \$243.6 million for Monetary authorities and depository credit intermediation (banking and finance), further reflecting the essential spending power of the forest workforce within their local communities.

Table 14: Top Ten Industries impacted by Minnesota State’s Forest Products Industries in terms of output production in 2023. †

Industries	Output
Wholesale - Other durable goods merchant wholesalers	\$620,296
Owner-occupied housing	\$433,156
Truck transportation	\$344,854
Electric power transmission and distribution	\$286,532
Wholesale - Other nondurable goods merchant wholesalers	\$276,719
Other real estate	\$267,630
Management of companies and enterprises	\$254,602
Hospitals	\$243,618
Monetary authorities and depository credit intermediation	\$243,554
Petroleum refineries	\$168,155
Total	\$3,139,117

† All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.

Importance of the Forest Products Industries in Context

Natural Resources and Agricultural Industries

To contextualize the economic importance of the forest economy, Table 15 compares the direct contributions of Minnesota's four primary natural resource sectors: Forest Products, Agriculture, Mining, and Commercial Fishing. The data indicates that while Agriculture is the dominant volume leader in the state, the Forest Products industry remains a critical and highly stable pillar of Minnesota's natural resource base.

In terms of employment, the landscape is defined by the sheer scale of the Agriculture sector. It supports 86,763 jobs, which accounts for roughly 64% of the total natural resources workforce. The Forest Products sector ranks second as a key industrial employer. It supports 33,990 jobs, which is more than double the workforce of the Mining sector (13,317 jobs) and significantly larger than Commercial Fishing (909 jobs).

However, a comparison of Value-Added (GSP) reveals a distinct competitive dynamic between the forestry and mining sectors. While the Forest Products sector contributed \$4.47 billion to the state GSP, the Mining, Oil, and Gas sector slightly edged it out with a contribution of \$4.50 billion. This occurred despite Mining having less than half the workforce of the forest sector. This discrepancy highlights the extreme capital intensity of the Mining sector, where immense physical capital investments drive high value-added per worker compared to the more labor-diversified forest products industry.

The comparative trend analysis underscores the Forest Products sector's role as a source of economic stability. Over the study period, other natural resource sectors exhibited extreme volatility. The Mining sector experienced explosive growth, with Output surging by 112.8% and Labor Income spiking by 165.8%. Similarly, the Agriculture sector saw its Labor Income rise by 76.3%. In contrast, the Forest Products sector demonstrated remarkable consistency. Its employment remained virtually unchanged (-0.2%) and output experienced only a marginal adjustment (-2.1%). So, in Minnesota, the forest economy provides a reliable, steady foundation for the state's rural labor market that is less susceptible to extreme volatility.

Table 15: Natural Resources and Agricultural Production Industries in Minnesota state, 2023. [†]

Industry	Employment	Δ2017 ^{††}	Labor Income	Δ2017 ^{††}	Value-Added	Δ 2017 ^{††}	Output	Δ 2017 ^{††}
1. Forest Products	33,990	-0.2%	\$2,819,364	-2.6%	\$4,473,392	2.2%	\$12,892,856	-2.1%
2. Commercial fishing, hunting & trapping	909	-14.7%	\$7,728	-30.8%	\$77,257	91.3%	\$81,364	94.4%
3. Mining, and oil & gas production	13,317	27.1%	\$1,865,848	165.8%	\$4,499,061	45.2%	\$10,278,799	112.8%
4. Agriculture production (plant crops and animals)	86,763	-6.8%	\$6,281,468	76.3%	\$9,483,656	45.7%	\$24,302,236	8.0%
Total	134,980	-2.7%	\$10,974,408	53.0%	\$18,533,366	32.1%	\$47,555,255	17.3%

[†] All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.

^{††} All percentage differences are calculated in real terms using 2023 constant dollars.

Manufacturing Industries

To assess the relative standing of the forest sector within Minnesota's industrial base, Table 16 compares "Forest Products Manufacturing" against the state's other major manufacturing groups. Note that in this context, "Forest Products" refers specifically to the manufacturing sub-sectors (Groups 3 through 7), excluding the extraction activities of forestry and logging and other non-manufacturing sectors (IMPLAN codes 10, 15, 16, 19, and 40 see Appendix A). The data reveals that while the forest sector is not the largest, it is a significant, high-volume industrial component within a highly diversified advanced manufacturing economy.

In terms of scale, the manufacturing landscape is defined by the high-tech and large-scale Food and Fabricated Metal sectors. Food Manufacturing is the largest employer with 52,046 jobs and the highest output at \$36.46 billion. Fabricated Metal follows closely, employing 46,006 workers.

By comparison, Forest Products Manufacturing ranks fifth in terms of direct employment, supporting 31,043 jobs. This means the forest sector accounts for a sizable 9.4% of Minnesota's total manufacturing workforce. In terms of financial contribution, the sector ranks high for both Output and Value-Added:

Output: The sector generates \$12.67 billion in direct output, ranking sixth.

Value-Added: It contributes \$4.32 billion to the Gross State Product, ranking seventh.

The data also highlights the diverse competitive productivity across Minnesota's industrial base. The Forest Products Manufacturing sector generates approximately \$408,000 in output per worker ($\$12.67\text{B} / 31,043$). This efficiency metric is robust and exceeds that of key sectors like Fabricated Metal (\$325,000 per worker) and Miscellaneous Manufacturing (\$365,000 per worker). However, it is significantly surpassed by the highly capital-intensive sectors, such as Petroleum and Coal Products (\$7.91 million per worker), Chemical Manufacturing (\$995,000 per worker) and Food Manufacturing (\$700,000 per worker), which typically utilize advanced automation and complex capital equipment. This places the forest sector as a highly productive middle-tier manufacturer, positioned between the extremely capital-intensive chemical/petroleum processors and the more labor-intensive metal fabricators.

Table 16: Manufacturing Industries in Minnesota state, 2023. †

Manufacturing Industries	Employment	Labor Income	Value Added	Output
Food	52,046	\$5,099,208	\$6,861,382	\$36,456,604
Fabricated Metal	46,006	\$4,209,032	\$5,966,928	\$14,954,039
Computer and Electronic Product	39,272	\$5,293,684	\$7,787,497	\$21,730,537
Machinery	35,886	\$3,668,709	\$5,870,907	\$16,916,866
Forest Products	31,043	\$2,698,334	\$4,319,876	\$12,665,019
Miscellaneous	29,743	\$3,086,847	\$5,517,800	\$10,847,950
Printing	19,033	\$1,475,865	\$2,322,421	\$4,271,928
Plastics and Rubber Products	15,960	\$1,380,129	\$1,794,533	\$6,674,135
Transportation Equipment	12,711	\$1,152,197	\$2,615,061	\$8,088,057
Chemical	12,458	\$2,312,951	\$3,562,667	\$12,392,354
Nonmetallic Mineral Product	9,959	\$1,118,008	\$1,342,832	\$3,738,997
Electrical Equipment	6,605	\$727,254	\$1,475,253	\$3,491,400
Beverage and Tobacco Product	5,783	\$363,500	\$697,631	\$2,587,107
Textiles and Apparel	5,600	\$304,575	\$330,963	\$1,113,275
Primary Metal	5,417	\$544,245	\$717,837	\$3,635,199
Petroleum and Coal	2,088	\$755,061	\$4,163,303	\$16,519,365
Total	329,608	\$34,189,600	\$55,346,892	\$176,082,832
Compared to 2017	-0.1%	0.9%	-5.2%	-3.4%

† All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.

Summary

The 2023 economic contribution report shows that the Forest Products sector remains a cornerstone of Minnesota's industrial base and a vital engine for its rural economy. Navigating a landscape defined by post-pandemic recovery and shifting market demands, the sector has demonstrated remarkable resilience, anchoring substantial employment while generating high-value industrial output.

In 2023, the Forest Products sector directly employed 33,991 individuals and generated \$12.89 billion in direct economic output. The sector's influence extends deeply into the broader regional economy; when accounting for indirect supply chain purchases and induced household spending, the total contribution reached 71,198 jobs and \$21.26 billion in total output. This indicates a robust employment multiplier of 2.09. Essentially, for every 100 direct jobs in the forest sector, an additional 109 jobs are supported elsewhere in the Minnesota economy, which reflects the deep integration of forest industries with local logistics, utilities, and service sectors.

The industry exhibits a distinct structural emphasis on value-added manufacturing rather than raw extraction. Unlike regions where primary forestry dominates employment, Minnesota's sector is defined by advanced processing. The Secondary Solid Wood Products group stands as the primary employment driver, supporting 13,144 jobs. Further, Despite employing fewer workers than the solid wood sectors, the Pulp, Paper, and Paperboard Mills sector remains a capital-intensive powerhouse. It generated over \$1.93 billion in direct output with only 2,109 workers, highlighting the high automation and value-generation capacity of the state's mills. When analyzing the specific, unaggregated industries, wood window and door manufacturing emerges as the most significant subsector, ranking first in employment, labor income, value added, and total output. Wood kitchen cabinet and countertop manufacturing ranks second in both direct employment and labor income, while paperboard container manufacturing ranks second in value added and output.

Within Minnesota's natural resource-based economy, the forest products sector represents a source of relative stability. While employment in mining experienced sharp but uneven growth and agriculture faced notable fluctuations, forest products employment remained essentially unchanged, with a 0.2% decline since 2017. Within the broader manufacturing sector, forest products occupies a solid mid-tier position, ranking as the fifth-largest manufacturing employer with 31,043 jobs and the sixth-largest producer by output, generating \$12.67 billion.

The study period (2017–2023) shows that the traditional sectors like Logging and Pulp and Paper faced structural contractions in employment, they have been counterbalanced by robust growth in the Secondary Solid Wood Products sector. Ultimately, by converting local renewable

resources into high-value construction components, paper packaging, and consumer goods, the sector not only sustains the state's working landscape but also exports substantial wealth. This solidifies its role as an enduring and sophisticated engine of Minnesota's economic identity.

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Appendix A: Forest Products Industries Groupings and IMPLAN Sectors

A1: Forestry Industry Grouping and IMPLAN Sectors

Industry Code	Industry name
10	All other crop farming***
15	Forestry, forest products, and timber tract production
19	Support activities for agriculture and forestry-*

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

Sectors denoted by “***” indicate that the corresponding FPI is not present in Minnesota.

A2: Logging Industry Grouping and IMPLAN Sector

Industry Code	Industry name
16	Commercial logging

A3: Primary Solid Wood Products Industry Grouping and IMPLAN Sectors

Industry Code	Industry name
40	Electric power generation – Biomass**
124	Sawmills
125	Wood preservation
126	Veneer and plywood manufacturing
128	Reconstituted wood product manufacturing

Note: Sectors with “**” indicate that it is treated as **full sector** in 2023; however in 2017 it was treated as a **partial (wood component only)** so the numbers are not strictly comparable.

A4: Secondary Solid Wood Products Industry Grouping and IMPLAN Sectors.

Industry Code	Industry name
127	Engineered wood member and truss manufacturing
129	Wood windows and door manufacturing
130	Cut stock, resawing lumber, and planning
131	Other millwork, including flooring
132	Wood container and pallet manufacturing
133	Manufactured home (mobile home) manufacturing
134	Prefabricated wood building manufacturing
135	All other miscellaneous wood product manufacturing

A5: Wood Furniture Industry Grouping and IMPLAN Sectors.

Industry Code	Industry name
348	Wood kitchen cabinet and countertop manufacturing
349	Upholstered household furniture manufacturing
350	Non-upholstered wood household furniture manufacturing
352	Institutional furniture manufacturing**
353	Wood office furniture manufacturing
354	Custom architectural woodwork and millwork
356	Showcase, partition, shelving, and locker manufacturing**

Note: Sectors with “**” indicate that it is treated as **full sector** in 2023; however in 2017 it was treated as a **partial (wood component only)** so the numbers are not strictly comparable.

A6: Pulp, Paper, and Paperboard Mills Industry Grouping and IMPLAN Sectors.

Industry Code	Industry name
136	Pulp mills
137	Paper mills
138	Paperboard mills

A7: Secondary Paperboard and Other Paper Products Industry Grouping and IMPLAN Sectors.

Industry Code	Industry name
139	Paperboard container manufacturing
140	Paper bag and coated and treated paper manufacturing
141	Stationery product manufacturing
142	Sanitary paper product manufacturing
143	All other converted paper product manufacturing

Appendix B. Detailed Economic Contribution Results of 2023

B1: Direct Economic Contribution by IMPLAN Sector, 2023

B1.1: Direct Economic Contributions, Forestry Sector Details, 2023. [†]

Industries	Employment	Labor Income	Value-Added	Output
All other crop farming	0	\$0	\$0	\$0
Forestry, forest products, and timber tract production	263	\$10,193	\$13,172	\$15,753
Support activities for agriculture and forestry	715	\$25,073	\$26,138	\$27,686
Total	978	\$35,267	\$39,310	\$43,439

[†] All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.

B1.2: Direct Economic Contributions, Logging Sector Details (2023, in 2023 USD). [†]

Industries	Employment	Labor Income	Value-Added	Output
Commercial logging	1,871	\$70,447	\$75,636	\$83,302
Total	1,871	\$70,447	\$75,636	\$83,302

[†] All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.

B1.3: Direct Economic Contributions, Primary Solid Wood Products Sector Details (2023, in 2023 USD).[†]

Industries	Employment	Labor Income	Value- Added	Output
Electric power generation - Biomass	99	\$15,316	\$38,570	\$101,096
Sawmills	289	\$17,825	\$29,335	\$139,396
Wood preservation	158	\$27,779	\$75,086	\$178,319
Veneer and plywood manufacturing	185	\$14,667	\$26,756	\$73,884
Reconstituted wood product manufacturing	579	\$71,436	\$209,596	\$596,245
Total	1,311	\$147,024	\$379,343	\$1,088,941

[†] All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.

B1.4: Direct Economic Contributions, Secondary Solid Wood Products Sector Details (2023, in 2023 USD).[†]

Industries	Employment	Labor Income	Value-Added	Output
Engineered wood member and truss manufacturing	1,018	\$82,455	\$122,298	\$423,691
Wood windows and door manufacturing	7,964	\$783,475	\$1,097,546	\$2,717,523
Cut stock, resawing lumber, and planing	12	\$538	\$1,007	\$4,386
Other millwork, including flooring	536	\$36,934	\$62,223	\$177,550
Wood container and pallet manufacturing	1,615	\$117,605	\$155,571	\$434,909
Manufactured home (mobile home) manufacturing	569	\$46,867	\$54,847	\$181,585
Prefabricated wood building manufacturing	621	\$53,500	\$91,651	\$248,267
All other miscellaneous wood product manufacturing	809	\$60,387	\$88,068	\$239,160
Total	13,144	\$1,181,760	\$1,673,211	\$4,427,072

[†] All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.

B1.5: Direct Economic Contributions, Wood Furniture Sector Details (2023, 2023 USD).[†]

Industries	Employment	Labor Income	Value-Added	Output
Wood kitchen cabinet and countertop manufacturing	5,190	\$347,400	\$415,019	\$1,019,909
Upholstered household furniture manufacturing	0	\$0	\$0	\$0
Non-upholstered wood household furniture manufacturing	172	\$7,958	\$9,238	\$29,784
Institutional furniture manufacturing	806	\$70,158	\$82,491	\$205,715
Wood office furniture manufacturing	610	\$39,175	\$51,884	\$159,516
Custom architectural woodwork and millwork	753	\$59,640	\$33,586	\$151,849
Showcase, partition, shelving, and locker manufacturing	910	\$64,582	\$84,431	\$248,222
Total	8,442	\$588,912	\$676,649	\$1,814,994

[†] All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.

B1.6: Direct Economic Contributions, Pulp, Paper, and Paperboard Mills Sector Details (2023, in 2023 USD).[†]

Industries	Employment	Labor Income	Value-Added	Output
Pulp mills	39	\$4,579	\$7,953	\$28,476
Paper mills	1,599	\$180,255	\$476,729	\$1,443,183
Paperboard mills	471	\$55,534	\$139,153	\$458,810
Total	2,109	\$240,368	\$623,835	\$1,930,470

[†] All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.

B1.7: Direct Economic Contributions, Secondary Paperboard and Other Paper Products Sector Details (2023, in 2023 USD).[†]

Industries	Employment	Labor Income	Value-Added	Output
Paperboard container manufacturing	3,464	\$309,171	\$546,827	\$2,103,216
Paper bag and coated and treated paper manufacturing	2,041	\$182,955	\$346,597	\$1,047,981
Stationery product manufacturing	431	\$43,452	\$57,292	\$201,080
Sanitary paper product manufacturing	115	\$12,712	\$39,051	\$112,202
All other converted paper product manufacturing	84	\$7,296	\$15,642	\$40,160
Total	6,135	\$555,586	\$1,005,409	\$3,504,639

[†] All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.

B2: Direct Economic Contribution by IMPLAN Sector, 2017 (2017 USD))

B2.1: Direct Economic Contributions, Forestry Sector Details (2017, in Nominal 2017 USD).[†]

Industries	Employment	Labor Income	Value- Added	Output
All other crop farming	270	4,634	6,020	13,088
Forestry, forest products, and timber tract production	493	19,471	19,462	21,356
Support activities for agriculture and forestry	19	286	430	932
Total	782	\$24,391	\$25,912	\$35,376

[†] All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.

B2.2: Direct Economic Contributions, Logging Sector Details (2017, in Nominal 2017 USD).[†]

Industries	Employment	Labor Income	Value-Added	Output
Commercial logging	2495	\$54,797	\$86,138	\$140,983
Total	2495	\$54,797	\$86,138	\$140,983

[†] All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2017 dollars value.

B2.3: Direct Economic Contributions, Primary Solid Wood Products Sector Details (2017, in Nominal 2017 USD).[†]

Industries	Employment	Labor Income	Value- Added	Output
Electric power generation - Biomass	179	\$19,226	\$69,476	\$143,357
Sawmills	492	\$36,865	\$39,948	\$148,274
Wood preservation	190	\$17,157	\$31,667	\$122,500
Veneer and plywood manufacturing	189	\$13,758	\$15,736	\$55,181
Reconstituted wood product manufacturing	439	\$40,076	\$66,527	\$250,915
Total	1489	\$127,083	\$223,354	\$720,227

[†] All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2017 dollars value.

B2.4: Direct Economic Contributions, Secondary Solid Wood Products Sector Details (2017, in Nominal 2017 USD).[†]

Industries	Employment	Labor Income	Value-Added	Output
Engineered wood member and truss manufacturing	1058	\$69,132	\$74,618	\$244,668
Wood windows and door manufacturing	5728	\$442,093	\$565,701	\$1,467,074
Cut stock, resawing lumber, and planing	62	\$6,183	\$7,024	\$17,024
Other millwork, including flooring	851	\$58,508	\$74,559	\$193,584
Wood container and pallet manufacturing	1510	\$100,164	\$113,498	\$267,390
Manufactured home (mobile home) manufacturing	566	\$31,299	\$49,105	\$142,947
Prefabricated wood building manufacturing	479	\$34,095	\$37,528	\$91,984
All other miscellaneous wood product manufacturing	1034	\$89,148	\$101,586	\$226,970
Total	11288	\$830,622	\$1,023,619	\$2,651,642

[†] All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2017 dollars value.

B2.5: Direct Economic Contributions, Wood Furniture Sector Details (2017, in Nominal 2017 USD).[†]

Industries	Employment	Labor Income	Value-Added	Output
Wood kitchen cabinet and countertop manufacturing	5711	\$291,365	\$327,137	\$843,260
Upholstered household furniture manufacturing	19	\$821	\$960	\$3,670
Non-upholstered wood household furniture manufacturing	195	\$5,941	\$7,529	\$22,357
Institutional furniture manufacturing	637	\$48,851	\$57,736	\$138,509
Wood office furniture manufacturing	590	\$31,080	\$47,970	\$130,070
Custom architectural woodwork and millwork	505	\$33,528	\$39,237	\$87,221
Showcase, partition, shelving, and locker manufacturing	916	\$56,515	\$70,267	\$194,874
Total	8575	\$468,103	\$550,837	\$1,419,961

[†] All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2017 dollars value.

B2.6: Direct Economic Contributions, Pulp, Paper, and Paperboard Mills Sector Details (2017, in Nominal 2017 USD).[†]

Industries	Employment	Labor Income	Value-Added	Output
Pulp mills	12	\$3,665	\$4,368	\$10,763
Paper mills	1940	\$202,234	\$507,421	\$1,641,381
Paperboard mills	590	\$64,112	\$158,546	\$533,561
Total	2542	\$270,012	\$670,335	\$2,185,705

[†] All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2017 dollars value.

B2.7: Direct Economic Contributions, Secondary Paperboard and Other Paper Products Sector Details (2017, in Nominal 2017 USD).[†]

Industries	Employment	Labor Income	Value-Added	Output
Paperboard container manufacturing	3685	\$305,480	\$462,814	\$1,797,129
Paper bag and coated and treated paper manufacturing	2379	\$216,228	\$408,557	\$1,195,576
Stationery product manufacturing	680	\$60,678	\$105,955	\$290,661
Sanitary paper product manufacturing	44	\$3,459	\$12,590	\$35,789
All other converted paper product manufacturing	96	\$6,496	\$8,781	\$30,217
Total	6885	\$592,342	\$998,697	\$3,349,371

[†] All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2017 dollars value.

B3: Direct Economic Contribution by IMPLAN Sector, 2017 (2023 USD)

B3.1: Direct Economic Contributions, Forestry Sector Details (2017, in 2023 USD).[†]

Industries	Employment	Labor Income	Value-Added	Output
All other crop farming	270	\$5,666	\$7,360	\$16,404
Forestry, forest products, and timber tract production	493	\$23,808	\$23,797	\$26,766
Support activities for agriculture and forestry	19	\$350	\$525	\$1,168
Total	782	\$29,823	\$31,683	\$44,338

[†] All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.

B3.2: Direct Economic Contributions, Logging Sector Details (2017, in 2023 USD).[†]

Industries	Employment	Labor Income	Value-Added	Output
Commercial logging	2,495	\$67,002	\$105,323	\$176,697
Total	2,495	\$67,002	\$105,323	\$176,697

[†] All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.

B3.3: Direct Economic Contributions, Primary Solid Wood Products Sector Details (2017, in 2023 USD).[†]

Industries	Employment	Labor Income	Value-Added	Output
Electric power generation - Biomass	179	\$23,508	\$84,950	\$179,673
Sawmills	492	\$45,076	\$48,846	\$185,834
Wood preservation	190	\$20,979	\$38,720	\$153,532
Veneer and plywood manufacturing	189	\$16,823	\$19,241	\$69,159
Reconstituted wood product manufacturing	439	\$49,003	\$81,344	\$314,477
Total	1,489	\$155,388	\$273,101	\$902,675

[†] All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.

B3.4: Direct Economic Contributions, Secondary Solid Wood Products Sector Details (2017, in 2023 USD).[†]

Industries	Employment	Labor Income	Value-Added	Output
Engineered wood member and truss manufacturing	1,058	\$84,529	\$91,238	\$306,648
Wood windows and door manufacturing	5,728	\$540,560	\$691,700	\$1,838,713
Cut stock, resawing lumber, and planing	62	\$7,560	\$8,588	\$21,337
Other millwork, including flooring	851	\$71,540	\$91,166	\$242,623
Wood container and pallet manufacturing	1,510	\$122,474	\$138,777	\$335,125
Manufactured home (mobile home) manufacturing	566	\$38,271	\$60,042	\$179,159
Prefabricated wood building manufacturing	479	\$41,689	\$45,886	\$115,286
All other miscellaneous wood product manufacturing	1,034	\$109,004	\$124,213	\$284,465
Total	11,288	\$1,015,627	\$1,251,609	\$3,323,356

[†] All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.

B3.5: Direct Economic Contributions, Wood Furniture Sector Details (2017, in 2023 USD).[†]

Industries	Employment	Labor Income	Value-Added	Output
Wood kitchen cabinet and countertop manufacturing	5,711	\$356,261	\$400,001	\$1,056,875
Upholstered household furniture manufacturing	19	\$1,003	\$1,173	\$4,600
Non-upholstered wood household furniture manufacturing	195	\$7,265	\$9,206	\$28,020
Institutional furniture manufacturing	637	\$59,732	\$70,595	\$173,596
Wood office furniture manufacturing	590	\$38,003	\$58,655	\$163,019
Custom architectural woodwork and millwork	505	\$40,996	\$47,976	\$109,316
Showcase, partition, shelving, and locker manufacturing	916	\$69,103	\$85,918	\$244,239
Total	8,575	\$572,363	\$673,525	\$1,779,666

[†] All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.

B3.6: Direct Economic Contributions, Pulp, Paper, and Paperboard Mills Sector Details (2017, in 2023 USD).[†]

Industries	Employment	Labor Income	Value- Added	Output
Pulp mills	12	\$4,482	\$5,341	\$13,489
Paper mills	1,940	\$247,278	\$620,438	\$2,057,176
Paperboard mills	590	\$78,392	\$193,859	\$668,723
Total	2,542	\$330,151	\$819,638	\$2,739,388

[†] All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.

B3.7: Direct Economic Contributions, Secondary Paperboard and Other Paper Products Sector
 Details (2017, in real 2023 Dollars).[†]

Industries	Employment	Labor Income	Value- Added	Output
Paperboard container manufacturing	3,685	\$373,520	\$565,897	\$2,252,378
Paper bag and coated and treated paper manufacturing	2,379	\$264,388	\$499,555	\$1,498,439
Stationery product manufacturing	680	\$74,193	\$129,554	\$364,291
Sanitary paper product manufacturing	44	\$4,230	\$15,394	\$44,855
All other converted paper product manufacturing	96	\$7,943	\$10,737	\$37,871
Total	6,885	\$724,275	\$1,221,137	\$4,197,834

[†] All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.

B4: Comparison of State-Level Direct Contributions in the Northeast–Midwest Region, 2023[†]

States	Employment	Labor Income	Value-Added	Output
Connecticut	6,930	\$595,236	\$1,145,576	\$3,197,475
Delaware	2,050	\$164,048	\$419,852	\$1,129,545
Illinois	38,281	\$3,270,414	\$4,474,853	\$15,739,897
Indiana	47,610	\$3,653,750	\$5,302,374	\$16,579,552
Iowa	18,155	\$1,543,126	\$2,278,717	\$6,429,515
Maine	16,067	\$1,166,317	\$1,787,856	\$6,147,704
Maryland	8,140	\$460,422	\$862,610	\$2,853,015
Massachusetts	14,594	\$1,593,184	\$1,800,086	\$5,852,619
Michigan	42,478	\$3,390,446	\$4,942,888	\$16,843,409
Minnesota	33,990	\$2,819,364	\$4,473,393	\$12,892,857
Missouri	24,896	\$1,802,100	\$2,925,761	\$9,026,527
New Hampshire	5,995	\$417,628	\$569,666	\$1,693,399
New Jersey	18,428	\$1,547,595	\$2,137,970	\$7,133,532
New York	36,968	\$3,302,396	\$4,566,432	\$15,142,713
Ohio	55,317	\$4,602,364	\$6,169,822	\$21,408,553
Pennsylvania	66,393	\$5,462,102	\$8,669,449	\$27,550,098
Rhode Island	2,590	\$184,246	\$239,515	\$990,357
Vermont	7,701	\$314,389	\$432,398	\$1,557,872
West Virginia	8,397	\$500,046	\$908,472	\$2,850,509
Wisconsin	61,443	\$4,890,298	\$8,774,277	\$28,331,645
20 states region (sum)	516,423	\$41,679,471	\$62,881,967	\$203,350,793
20 states region (model)	514,361	\$41,651,622	\$62,857,669	\$203,328,715

[†] All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.

Note: The figures presented in Appendix B4 reflect results from 20 individual state-level models, the totals of which are shown under “20-state region (sum)”. Additionally, a separate regional model was estimated, with its results reported as “20-state region (model)”, corresponding to the estimates cited in the main body of this report. Small differences between the two are due to how two partial sectors, Sector 10: All other crop farming and Sector 19: Support activities for agriculture and forestry, were handled. The share of these sectors varies by state, and some states had no activity in them. In the regional model, a single percentage was used across all states, which causes minor discrepancies. For regional reporting, the “20-state region (model)” values are recommended.

B5: Northeast-Midwest State's Direct Employment by Industry group, 2023

State	Forestry	Logging	Primary Solid Wood Products	Secondary Solid Wood Products	Wood Furniture	Pulp, Paper, and Paperboard mills	Secondary Paperboard & other Paper Products
Connecticut	166	190	236	1,288	2,041	850	2,159
Delaware	71	41	23	336	666	0	913
Illinois	492	861	802	7,541	10,965	1,193	16,427
Indiana	450	1,228	3,619	13,061	18,942	1,376	8,934
Iowa	88	584	480	10,382	3,484	244	2,893
Maine	1,874	3,286	2,952	2,391	1,468	2,640	1,456
Maryland	575	643	566	3,003	1,601	120	1,632
Massachusetts	800	673	202	3,069	3,201	1,424	5,225
Michigan	1,608	3,543	5,846	6,621	12,433	3,206	9,221
Minnesota	978	1,871	1,311	13,144	8,442	2,109	6,135
Missouri	650	1,601	2,556	5,724	7,468	59	6,838
New Hampshire	1,246	1,103	1,033	1,001	957	379	276
New Jersey	299	438	437	3,025	6,449	360	7,420
New York	1,228	3,224	2,934	6,694	9,658	4,546	8,684
Ohio	480	2,545	2,750	13,953	14,009	2,368	19,212
Pennsylvania	2,161	3,258	6,245	19,555	13,857	2,283	19,034
Rhode Island	4	34	90	474	916	61	1,011
Vermont	2,941	1,145	818	960	1,203	581	53
West Virginia	630	1,303	2,453	2,307	1,346	166	192
Wisconsin	788	3,311	4,216	14,469	12,238	8,115	18,306
20 states region (sum)	17,529	30,882	39,569	128,998	131,344	32,080	136,020
20 states region (model)	15,469	30,882	39,568	128,997	131,346	32,081	136,018

Note: The figures presented in Appendix B5 reflect results from 20 individual state-level models, the totals of which are shown under “20-state region (sum)”. Additionally, a separate regional model was estimated, with its results reported as “20-state region (model)”, corresponding to the estimates cited in the main body of this report. Differences between the two for the Forestry sector arise from the

treatment of two partial sectors, Sector 10: All other crop farming and Sector 19: Support activities for agriculture and forestry. The share of these sectors varies by state, and some states had no activity in them. And the small differences in the other sectors are due to rounding.. In the regional model, a single percentage was used across all states, which causes minor discrepancies. For regional reporting, the “20-state region (model)” values are recommended.

B6: Northeast-Midwest State's Direct Output by Industry group, 2023

State	Forestry	Logging	Primary Solid Wood Products	Secondary Solid Wood Products	Wood Furniture	Pulp, Paper, and Paperboard mills	Secondary Paperboard & other Paper Products
Connecticut	\$12,660	\$61,651	\$144,432	\$351,302	\$447,751	\$850,984	\$1,328,695
Delaware	\$3,080	\$23,277	\$14,198	\$103,146	\$187,821	\$0	\$798,024
Illinois	\$23,797	\$193,564	\$549,468	\$2,257,584	\$2,668,638	\$960,510	\$9,086,336
Indiana	\$27,858	\$126,379	\$1,637,223	\$4,217,912	\$4,276,256	\$1,239,830	\$5,054,094
Iowa	\$5,051	\$93,632	\$235,316	\$3,309,017	\$741,619	\$261,685	\$1,783,195
Maine	\$63,402	\$145,225	\$1,712,090	\$751,920	\$297,098	\$2,157,684	\$1,020,285
Maryland	\$19,599	\$75,769	\$341,370	\$1,086,068	\$339,051	\$89,572	\$901,586
Massachusetts	\$31,771	\$108,064	\$102,091	\$890,240	\$679,955	\$1,223,373	\$2,817,125
Michigan	\$71,013	\$172,938	\$3,562,861	\$2,195,976	\$3,190,837	\$2,629,961	\$5,019,823
Minnesota	\$43,439	\$83,302	\$1,088,941	\$4,427,072	\$1,814,994	\$1,930,470	\$3,504,639
Missouri	\$38,583	\$168,482	\$1,252,909	\$1,671,368	\$1,551,611	\$58,988	\$4,284,586
New Hampshire	\$40,592	\$83,409	\$601,484	\$342,759	\$187,514	\$295,202	\$142,439
New Jersey	\$21,173	\$146,582	\$294,812	\$859,907	\$1,427,050	\$296,008	\$4,088,000
New York	\$61,740	\$439,414	\$1,449,512	\$1,967,685	\$2,055,059	\$3,956,789	\$5,212,514
Ohio	\$41,970	\$445,442	\$1,369,023	\$4,226,590	\$2,932,868	\$1,957,514	\$10,435,146
Pennsylvania	\$144,012	\$382,433	\$3,488,794	\$6,110,593	\$3,029,043	\$2,173,786	\$12,221,437
Rhode Island	\$429	\$22,462	\$55,109	\$124,117	\$211,336	\$50,916	\$525,988
Vermont	\$99,313	\$47,195	\$387,082	\$288,208	\$231,041	\$478,672	\$26,361
West Virginia	\$20,649	\$129,353	\$1,437,114	\$760,390	\$263,462	\$134,114	\$105,427
Wisconsin	\$38,983	\$241,275	\$2,317,952	\$4,391,982	\$2,674,116	\$7,217,011	\$11,450,326
20 states region (sum)	\$809,114	\$3,189,848	\$22,041,781	\$40,333,836	\$29,207,121	\$27,963,069	\$79,806,026
20 states region (model)	\$787,034	\$3,189,848	\$22,041,780	\$40,333,837	\$29,207,122	\$27,963,069	\$79,806,025

Note: The numbers presented in the Table B6 reflect results from 20 individual state-level models, the totals of which are shown under "20-state region (sum)". Additionally, a separate regional model was estimated, with its results reported as "20-state region (model)",

corresponding to the estimates cited in the main body of this report. Differences between the two for the Forestry sector are due to how two partial sectors, Sector 10: All other crop farming and Sector 19: Support activities for agriculture and forestry, were handled. The share of these sectors varies by state, and some states had no activity in them. Small differences in the other sectors are due to rounding. In the regional model, a single percentage was used across all states, which causes minor discrepancies. For regional reporting, the “20-state region (model)” values are recommended.