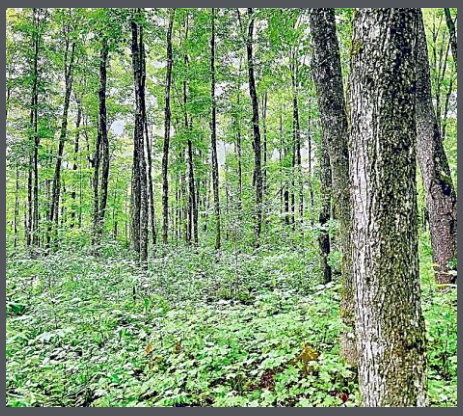

Forest Products Industries' Economic Contributions: Iowa, 2023

Prepared For:
Iowa Department of Natural Resources
On behalf of,
Northeast-Midwest State Foresters Alliance
Washington DC, USA

Prepared by:
Basanta **Lamsal**, PhD
Jagdish **Poudel**, PhD
Raju **Pokharel**, PhD

Department of Forestry
Michigan State University
East Lansing, Michigan, USA

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NORTHEAST-MIDWEST STATE FORESTERS ALLIANCE

Department of Forestry
MICHIGAN STATE UNIVERSITY

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Authors

Basanta Lamsal, PhD: Dr. Basanta Lamsal is a Postdoctoral Fellow in the Department of Forestry at Michigan State University. Dr. Lamsal specializes in in the application of input–output economics to the forest sector, forest resource economics, and the auction theory applied to timber markets.

Jagdish Poudel, PhD: Dr. Jagdish Poudel is Forest Economist for the Michigan Department of Natural Resources and an Adjunct Assistant Professor in the Department of Forestry at Michigan State University. Dr. Poudel specializes in traditional forest economics research such as analyzing stumpage demand and supply, timber prices, and forest product utilization, markets, and business. His interests extend to economic analyses of new wood innovations, such as mass timber and woody biomass energy, as well as ecosystem services markets, including habitat conservation and wetland mitigation banking, outdoor recreation and tourism, urban and community forestry, international forestry, and forest carbon markets.

Raju Pokharel, PhD: Dr. Raju Pokharel is an Assistant Professor of Forest Resource Economics in the Department of Forestry at Michigan State University. Dr. Pokharel specializes in evaluating and developing market opportunities for forest products including timber, bioenergy, mass timber, biochar, and others, estimating forest product feedstock supply and market competitions, and assessing the economic trade-off of timber products under different management strategies.

For more information:

Forest Economics and Resource Management Lab (MSU FERM)
URL: https://www.canr.msu.edu/FERM/
Room 208, Natural Resources Building, 480 Wilson Rd,
Department of Forestry, Michigan State University
East Lansing, Michigan 68842

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Foreword

Iowa's forests are a crucial natural and economic foundation, covering around 2.96 million acres of the state's landscape. These woodlands offer vital ecosystem services—including preventing soil erosion, improving air quality, and filtering water—while also forming the backbone of a sophisticated industrial sector. Since 85.9% of Iowa's forest land is privately owned, the stewardship of individual landowners is essential to preserving the health and productivity of both rural and urban community forests.

The Iowa Department of Natural Resources (DNR) remains committed to enhancing these resources through technical assistance, sustainable management demonstrations on public lands, and comprehensive educational outreach. These efforts support a robust forest products industry that has demonstrated remarkable resilience and stability. In 2023, the sector directly supported **18,154 jobs** and generated **$6.43 billion in direct output**. When accounting for broader supply-chain linkages and household spending, the total economic footprint expands to **33,071 jobs** and $9.33 billion in total output.

This industry is a primary driver of Iowa's natural resource economy, ranking second only to agriculture in both employment and output. Beyond the **$38 million in annual timber sales** that fuel the primary supply chain, the state has developed a specialized strength in downstream manufacturing. Industry leaders, such as wood window and door manufacturing, anchor a "value-lift" ecosystem that converts raw timber into high-value consumer goods.

While economic metrics help quantify the industry's importance, they cannot fully capture the intrinsic value of our forests. These lands provide irreplaceable recreational spaces for hunting, fishing, and nature study, while supporting complex biodiversity that is difficult to re-engineer once lost. Ensuring Iowa's forests remain in a healthy, sustainable condition is a duty we owe to current woodland owners, the businesses that depend on timber resources, and the future generations who will inherit this environment.

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Executive Summary

Based on 2023 FIA estimates, Iowa contains approximately 2.96 million acres of forest land, representing about 8.3 percent of the state's total land area of 35.62 million acres. Of this forest base, 2.82 million acres (95.2 percent) are classified as timberland, defined as forest land capable of producing commercial volumes of wood. Reserved forestland accounts for 124,247 acres (4.2 percent), while other forestland represents a small share at 16,419 acres (0.6 percent). Non-forest land comprises roughly 32.66 million acres, or 91.7 percent of Iowa's total land area. Building on this land-use context, this report summarizes the economic contribution of Iowa's forest products industries using IMPLAN 2023 data and examines changes in industry performance across the pre- and post-COVID period, with emphasis on trends observed over the past five years.

Forest Product Industries

This report analyzes the economic contribution of Iowa's forest products sector, comprised of 28 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[1], and Secondary paperboard and other paper products. In 2023, these industries directly supported 18,154 jobs and generated $6.43 billion in output, $2.28 billion in value added, and $1.54 billion in labor income. When indirect supply-chain linkages and induced household-spending effects are included, the sector's total economic footprint reached 33,071 jobs, $9.33 billion in output, $3.93 billion in value added, and $2.46 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 82 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 (10,382 jobs), followed by Wood Furniture (3,484 jobs) and Secondary Paperboard and Other Paper Products (2,893 jobs). In terms of output, Secondary Solid Wood Products produced the highest direct output at $3.31 billion, serving as the sector's manufacturing engine. Secondary Paperboard and Other Paper Products generated $1.78 billion, highlighting the state's strength in converting and packaging. Forestry, while the smallest contributor in dollar terms ($5.1 million), provided the essential management and biological services supporting the broader value chain. Its full value is likely understated in this

[1] Industry groups are categorized consistently across all 22 Northeast-Midwest state reports. During the report period, Iowa had operating paper and specialty paperboard mills, but these facilities either imported pulp or used 100% post-consumer recycled pulp. Iowa had no operating pulp mills.

economic analysis because some benefits, such as cost-share support to private landowners, forest stand improvement activities, and long-term forest health outcomes, are not fully captured in market-based output measures.

Leading Individual Forest Products Sectors (direct contribution)

At the disaggregated level (28 sectors), Wood windows and door manufacturing remained the top individual employer with 8,205 jobs. Financial dominance was also concentrated in this sector, which ranked first in Labor Income ($778.6 million), Value Added ($934.1 million), and Output ($2.60 billion). Wood kitchen cabinet and countertop manufacturing was a consistent top-tier performer, ranking second in Employment (2,171 jobs), though Paperboard container manufacturing outpaced it in output ($1.22 billion) and value added ($405.3 million). Paper bag and coated and treated paper manufacturing also emerged as a major driver, ranking fourth in direct output ($345.6 million). These rankings show a downstream-focused economy: specialized secondary manufacturing (Windows, Doors, and Packaging) dominating over primary processing.

Iowa's Forest Products Industries Compared to Other Iowa Industries

The Forest Products sector remains a vital component of Iowa'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 ($6.43 billion) trailed Agriculture ($39.17 billion) but outperformed Mining ($4.72 billion) and Commercial Fishing ($35.0 million). In terms of employment, the 18,154 jobs supported by the forest industry accounted for roughly 14 percent of the state's total natural resources workforce, ranking behind Agriculture (104,894 jobs) but significantly surpassing Mining (5,139 jobs) and Commercial Fishing (277 jobs). Furthermore, within the statewide manufacturing landscape, Forest Products ranked as the sixth largest manufacturer by output and the fourth largest employer.

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

From 2017 to 2023, the sector demonstrated remarkable structural stability and resilience. Direct employment increased by 1.8 percent, while direct output increased by 3.0 percent in real terms. Notably, real Labor Income increased by 12.8 percent, significantly outpacing job growth.

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, in cubic feet, 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 20 cubic feet per acre per year of industrial wood in natural stands. Currently inaccessible and inoperable areas are included.)

Economic Contribution Terms

Direct effects/contributions: The 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 Iowa's economy. They provide jobs, raw materials, and finished goods that generate additional economic activity throughout the state, region, and nation. Forests in Iowa 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, paper and paperboard mills, 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 in Iowa 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 Iowa has shifted between 2017 and 2023 in terms of employment, output, labor income, and the Gross State Product (GSP), also known as value added[2]. 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.

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

[2] 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.

Analysis for Planning (IMPLAN). These data and related information are presented in four major sections: (i) Forest Resources of Iowa, (ii) Economic Contributions of the Iowa FPIs, (iii) Comparing FPIs with other industries and neighboring 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 Iowa

According to 2023 estimates from the USDA Forest Inventory and Analysis (FIA) program, Iowa's total land area is 35.62 million acres. Of this total, 2.96 million acres (8.3 percent) meet the FIA definition of forest land, while the remaining 32.66 million acres (91.7 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 Iowa's forest land base, timberland accounts for 2.82 million acres, or 95.2 percent (Figure 1), representing unreserved forest capable of producing at least 20 cubic feet of wood per acre per year. Reserved forestland comprises 124,247 acres (4.2 percent) and is withdrawn from timber utilization by legal or administrative designation. Other forestland totals 16,419 acres (0.6 percent) and consists of unreserved forests with low productivity. In practical terms, the vast majority of Iowa's forest land base is both unreserved and biophysically suitable for commercial timber management, with only a small share either reserved or too low in productivity to contribute materially to timber supply.

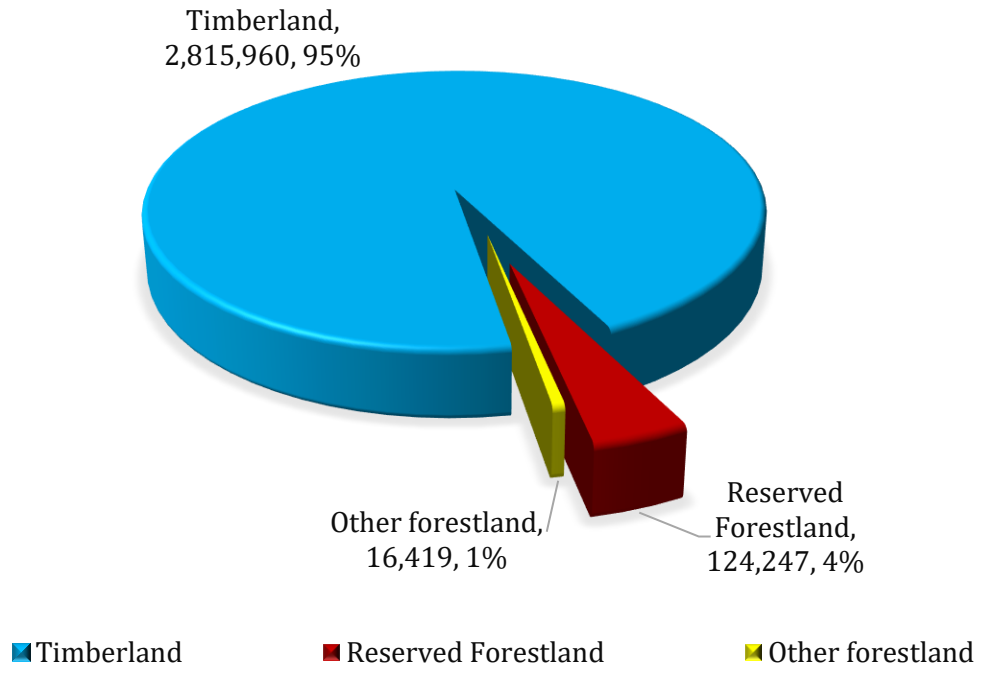

Figure 1: Iowa Forest Land area in acres by Land use type, 2023 (US Forest Service).

Ownership of Iowa's 2.96 million acres of forest land is distributed among federal, state, local, and private entities, with private landowners holding the greatest share (Figure 2). Private ownership accounts for 2,538,329 acres, representing 85.9 percent of the state's forest land base. State and local governments manage 306,066 acres (10.4 percent), reflecting a meaningful public ownership presence at the subnational level. Federal ownership is limited, totaling 112,230 acres (3.8 percent). No National Forest System lands exist in Iowa. Overall, Iowa's forest land base is characterized by a strong predominance of private ownership, complemented by a smaller state and local public land component and minimal federal involvement.

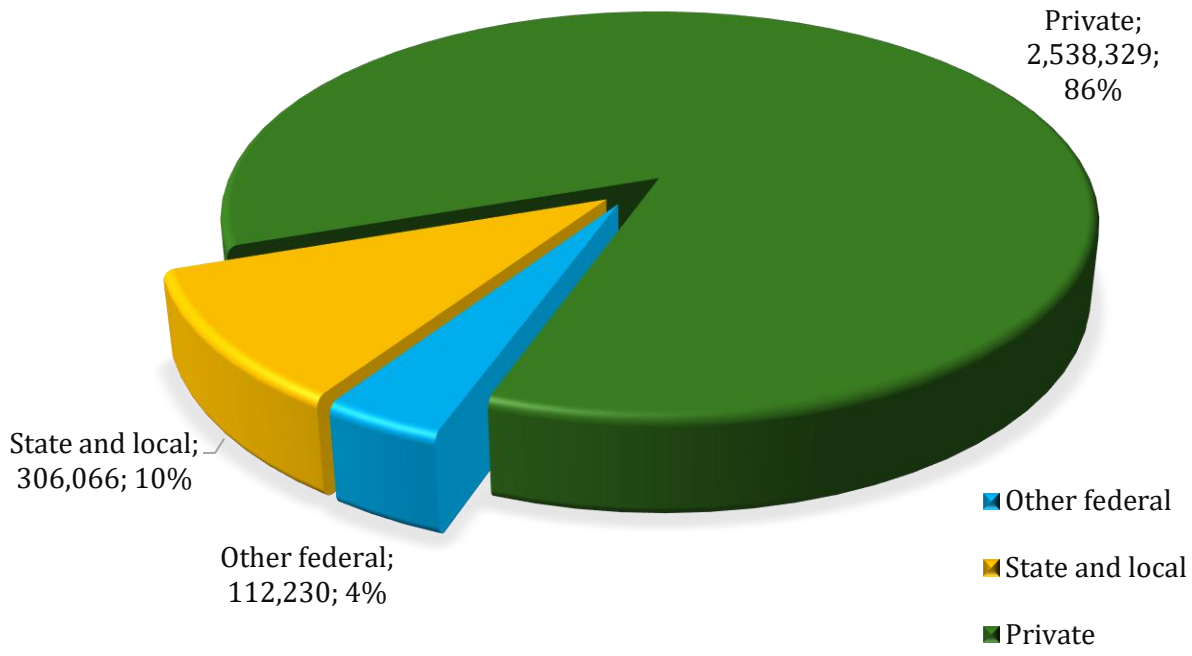

Figure 2: Iowa Forest Land area in acres by Ownership group, 2023 (US Forest Service).

Hardwood forest types dominate Iowa's 2.96 million acres of forest land (Figure 3). The oak/hickory forest-type group is the most extensive, occupying 1.97 million acres, or 67 percent of the state's forest land base. The elm/ash/cottonwood group represents the second-largest forest type, totaling 657,238 acres (22 percent) and reflecting the importance of bottomland and riparian hardwood forests across the state. Additional hardwood-dominated groups contribute smaller shares, including maple/beech/birch at 91,817 acres (3 percent). Mixed and softwood-associated forest types account for limited portions of the forest land base, including oak/pine at 69,298 acres (2 percent) and other eastern softwoods at 60,441 acres (2 percent). The remaining 107,847 acres (4 percent) are distributed across other forest-type groups. Taken together, hardwood-associated forest types account for the overwhelming majority of Iowa's forest land area, underscoring the state's predominantly hardwood forest composition.

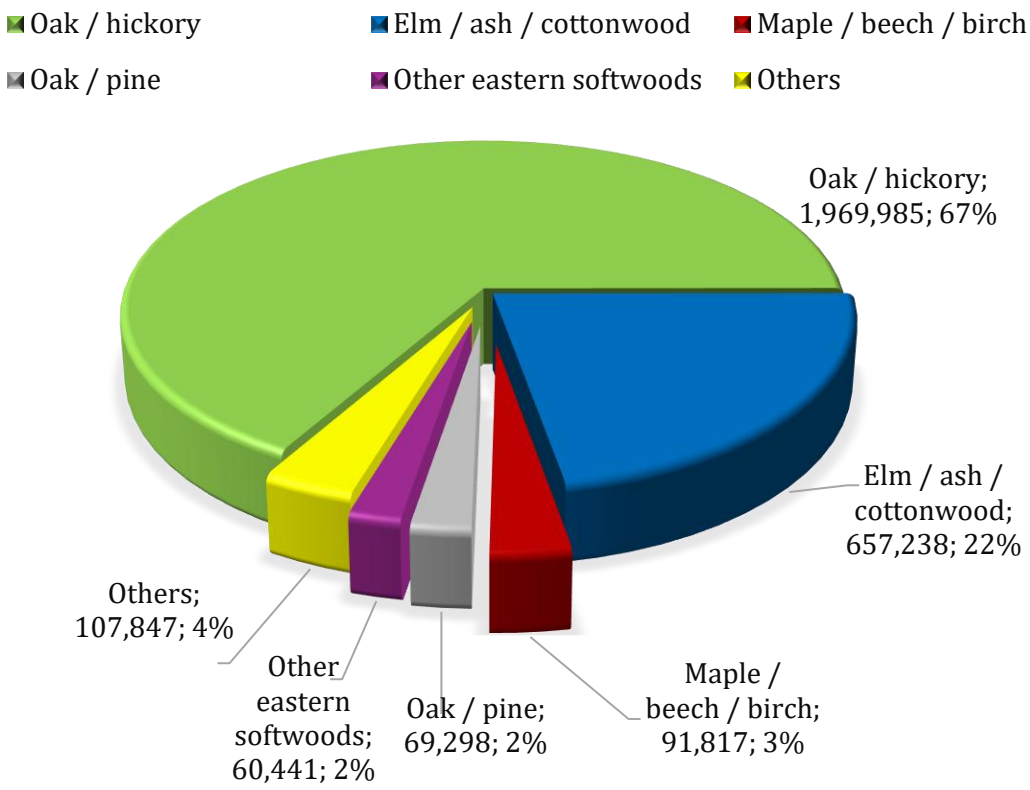

Figure 3*:* Iowa Forest Land area in acres by Forest type group, 2023 (US Forest Service).

Iowa's timber resources are dominated by hardwood growing stock, supporting forest-based activities that include commercial logging, sawtimber, pallet production, millwork, furniture, and other secondary wood products. The estimated volume of standing timber suitable for forest products, defined here as the marketable volume of growing stock, is approximately 5.24 billion cubic feet, or about 66 million standard cords (Table 1). Of this total, hardwoods account for 5.15 billion cubic feet, or 98.2 percent, while softwoods account for 93.4 million cubic feet, or 1.8 percent. By ownership class, about 83.6 percent of growing-stock volume is on private lands, 11.2 percent is on state and local lands, and 5.2 percent is on other federal lands. No growing-stock volume is reported on National Forest lands in the table.

Average annual net growth totals 82.3 million cubic feet per year, while average annual harvest removals total 17.0 million cubic feet and average annual mortality totals 51.4 million cubic feet per year. Net growth exceeds harvest removals by a ratio of about 4.8 to 1, indicating that removals remain well 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 65.3 million cubic feet per year. This positive balance indicates continued expansion of growing stock volume at the statewide level. Average annual harvest removals equal roughly 0.3 percent of standing volume, or about 0.2 million standard

cords, while mortality represents about 1.0 percent of standing volume. Hardwoods account for nearly all annual inventory flows, comprising 98.7 percent of net growth, 100.0 percent of harvest removals, and 99.5 percent of mortality. Harvest removals are concentrated on private lands, which account for about 84.2 percent of total removals, with the remainder occurring on state and local ownerships. Overall, these statewide indicators suggest that Iowa's growing stock inventory remains in a condition of positive net growth.

Table 1: Characteristics of Growing Stock in Iowa, 2023. †

Description	Species group	National Forest	Other federal	State and local	Private	Not available	**Total**
Net volume	Hardwood	0	269,418	576,843	4,301,575	0	**5,147,835**
	Softwood	0	3,308	10,227	79,886	0	**93,420**
	Total	**0**	**272,725**	**587,069**	**4,381,461**	**0**	**5,241,255**
Average annual net growth	Hardwood	0	4,263	6,507	69,449	980	**81,199**
	Softwood	0	40	69	954	2	**1,065**
	Total	**0**	**4,303**	**6,577**	**70,403**	**981**	**82,264**
Average annual harvest removals	Hardwood	0	0	2,683	14,324	0	**17,006**
	Softwood	0	0	0	0	0	**0**
	Total	**0**	**0**	**2,683**	**14,324**	**0**	**17,006**
Average annual mortality	Hardwood	0	3,063	7,047	41,044	0	**51,154**
	Softwood	0	0	129	112	0	**241**
	Total	**0**	**3,063**	**7,177**	**41,156**	**0**	**51,395**

† All amounts are in thousands of cubic feet.

Note: **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 Iowa) 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 is 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 Iowa 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 estimates how an existing industry supports the economy through its own activity and its linkages with other industries (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 of Iowa's Forest Sector over the seven-year study period. As shown in Figure 4, the Iowa forest industry is characterized by distinct workforce stability despite output volatility. Direct employment has demonstrated a steady upward trend since the 2020 pandemic-era low (17,660 jobs), peaking at 18,648 jobs in 2022 before stabilizing at 18,154 in 2023, surpassing the 2017 baseline of 17,834. Real Industry Output followed a more complex path; it faced a significant contraction in 2021 ($5.93 billion), creating a temporary divergence where employment expanded while output lagged. However, the sector corrected this disparity in 2023, surging by $449 million in a single year to reach $6.43 billion.

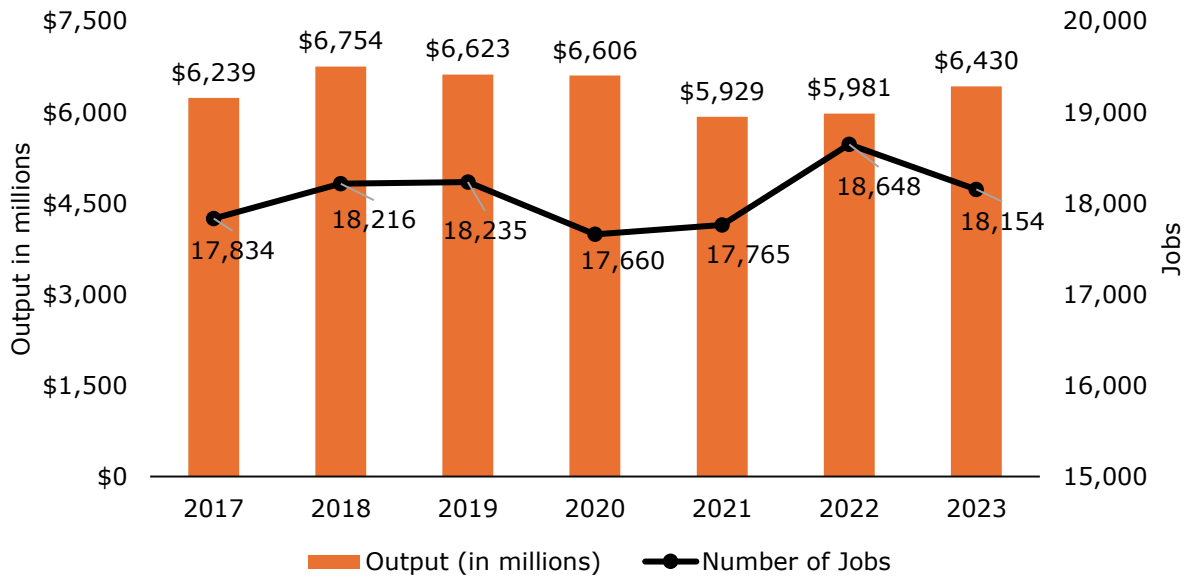

Figure 4: Direct output and employment, 2017–2023, Iowa forest products industries.

Figure 5 highlights the sector's internal value dynamics and its contribution to the state economy. A key technical divergence is visible here regarding labor costs: while Value Added (the net contribution to GSP) fluctuated, dipping to $2.10 billion in 2021 before recovering to $2.28 billion in 2023, Labor Income exhibited a consistent, uninterrupted upward trajectory. Rising from $1.37 billion in 2017 to $1.54 billion in 2023, Labor Income grew by nearly 13% over the period.

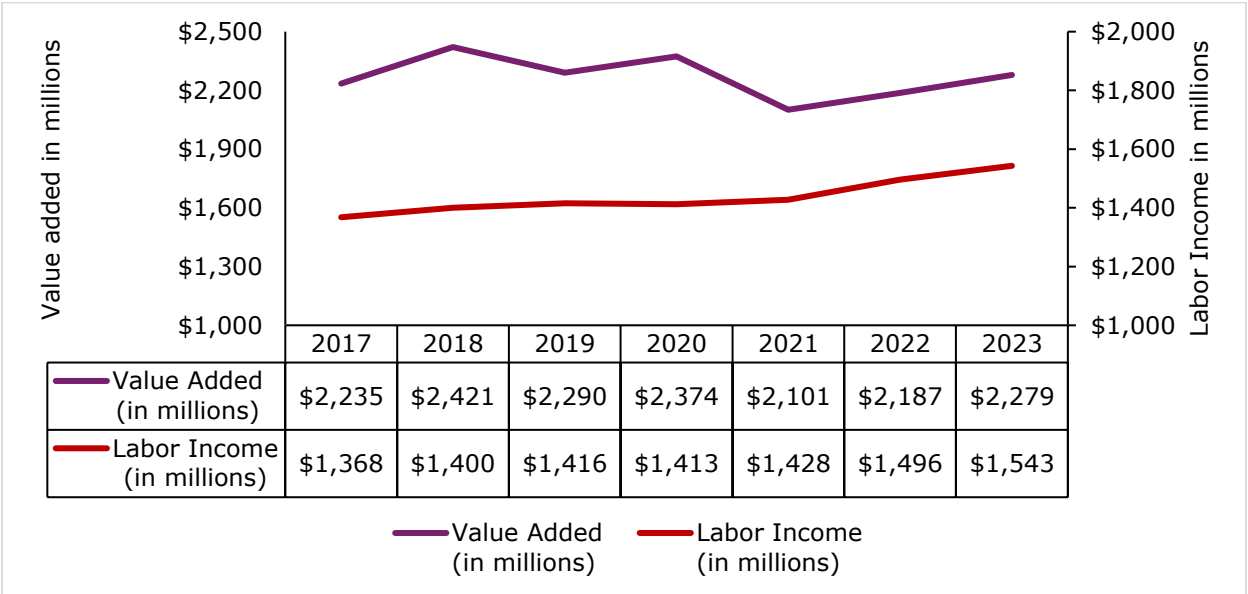

Figure 5: Direct value-added and labor income, 2017–2023, Iowa , forest products industries.

Direct and Total Contributions by Forest Product Industry Groups

In 2023, Iowa's forest products industries directly employed 18,154 individuals, generated $6.43 billion in gross output, and contributed approximately $2.28 billion in value-added to the state economy (Table 2). When accounting for indirect inter-industry transactions and induced household spending, the total economic contribution of the forest sector reached 33,071 jobs and $9.33 billion in total output.

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

	Employment	Labor Income	Value-added	Output
Direct in 2023	18,154	$1,543,125	$2,278,717	$6,429,516
Compared to 2017	1.8%	12.8%	1.9%	3.0%
Total Economic Contribution in 2023	33,071	$2,455,039	$3,931,754	$9,333,468
Compared to 2017	-1.7%	6.8%	3.2%	2.2%
Multipliers in 2023	1.82	1.59	1.73	1.45

† 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 distinct divergence between the core industry and its secondary economic ripples. While direct employment in the FPI actually expanded by 1.8%, the total employment impact contracted by 1.7%. The calculated multipliers illustrate the sector's specific integration into the Iowa economy. The employment multiplier of 1.82 indicates that for every 100 direct jobs in the forest industry, an additional 82 jobs are supported in other sectors. Similarly, the Value-Added multiplier of 1.73 suggests that every dollar of wealth created directly by forest industries generates an additional $0.73 elsewhere in 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, Iowa's FPI structure is overwhelmingly weighted toward downstream manufacturing rather than raw extraction. Iowa's employment is heavily concentrated in value-added production. The Secondary Solid Wood Products sector is the undisputed labor leader, directly employing 10,382 individuals, more than 15 times the combined workforce of the Forestry and Logging sectors (672 jobs). This disparity characterizes Iowa as a mature industrial ecosystem where the economic value is derived not from harvesting raw timber, but from processing inputs into high-value commodities like engineered wood, millwork, and cabinetry.

A stark divergence in capital intensity and operational efficiency is evident when comparing the manufacturing sub-sectors. For example, while Wood Furniture remains labor-intensive, requiring 3,484 workers to generate $741.6 million in output (approximately $212,000 per worker), the Paper, and Paperboard Mills sector exhibits a completely different production model. Despite employing a niche workforce of only 244 individuals, this sector generates nearly $261.7 million in output. This implies an output-per-worker ratio exceeding $1 million, indicating a highly capital-intensive environment where productivity is driven by machinery and energy inputs rather than manual labor.

When supply-chain and induced effects are integrated (Table 4), Secondary Solid Wood Products remains the primary economic engine, supporting 19,101 total jobs and over $5 billion in total output. However, the most potent leverage effects are found in the processing sectors. The Paper, and Paperboard Mills sector boasts a robust employment multiplier of 3.13 (764 total jobs supported by 244 direct jobs), and Primary Solid Wood Products follows with a multiplier of 2.55. These figures reflect deep backward linkages; even with smaller direct workforces, these industries sustain a disproportionately large network of loggers, truckers, and utility providers, acting as critical nodes that amplify economic activity throughout the regional supply chain.

Table 3: Direct Economic Contributions in Iowa, Industry Groups, 2023. †

Industries	Employment	Labor Income	Value-Added	Output
1.Forestry	88	$4,600	$4,759	$5,051
2.Logging	584	$36,684	$91,243	$93,632
3.Primary Solid Wood Products	480	$33,283	$48,473	$235,316
4.Secondary Solid Wood Products	10,382	$950,102	$1,144,341	$3,309,017
5.Wood Furniture	3,484	$218,544	$275,155	$741,619
6. Paper, and Paperboard mills	244	$29,236	$105,711	$261,685
7.Secondary Paperboard and other Paper Products	2,893	$270,677	$609,035	$1,783,195

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

Table 4: Total Economic Contributions in Iowa , Industry Groups, 2023. †

Industries	Employment	Labor Income	Value- Added	Output
1.Forestry	105	$5,519	$6,563	$8,044
2.Logging	735	$44,492	$106,185	$118,156
3.Primary Solid Wood Products	1,223	$80,954	$141,824	$386,827
4.Secondary Solid Wood Products	19,101	$1,479,942	$2,097,257	$5,010,550
5.Wood Furniture	5,407	$332,540	$485,039	$1,122,223
6. Paper, and Paperboard mills	764	$63,931	$171,109	$381,216
7.Secondary Paperboard and other Paper Products	6,506	$498,734	$1,034,133	$2,517,608

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

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.

Forestry

Economic Contribution of Forestry

Table 5 presents the economic contribution of the Forestry industry group. For Iowa, this group aggregates two primary sectors: (1) Forestry, forest products, and timber tract production, which involves the management of forest lands for the sale of standing timber; and (2) Support

activities for forestry. It is important to note that the all other crop farming sector (representing Maple Syrup production) is not disclosed in the Iowa dataset.

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

	Employment	Labor Income	Value-Added	Output
Direct	88	$4,600	$4,759	$5,051
Indirect	0.4	$34	$70	$138
Induced	17	$884	$1,734	$2,855
Total	**105**	**$5,519**	**$6,563**	**$8,044**

† 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 provided 88 jobs and generated $5.1 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 indicate an exceptionally labor-intensive industry where the vast majority of gross output goes to the workforce rather than to equipment or intermediate supplies. Specifically, nearly 91% of the sector's direct output flows to Labor Income ($4.6 million out of $5.1 million), suggesting that the value generated is almost entirely derived from human capital and service expertise.

This heavy reliance on labor rather than physical inputs dictates the sector's unique multiplier effects. The employment multiplier is approximately 1.19, meaning that for every 100 jobs in Forestry, roughly 19 additional jobs are supported elsewhere in the state. Breaking down 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 fewer than one full-time equivalent job (0.4) and only $138,000 in output. This reflects the low capital intensity of timber growing; unlike manufacturing industries that constantly purchase chemicals and energy, forestry operations have minimal business-to-business purchasing requirements.
- **Induced Effect:** In contrast, the induced effect supported 17 jobs and nearly $2.9 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 land managers spend their earnings within their local communities.

When these effects are combined, the Forestry industry contributed a total of 105 jobs, $8.0 million in output, and $6.6 million in value-added to the Iowa economy in 2023. The total output multiplier of 1.59 implies that every $100 of output generated by forest management activities generates an additional $59 of economic activity throughout the state.

Trend Analysis: Forestry (2017–2023)

As illustrated in Figure 6, the Forestry industry in Iowa has experienced a gradual but persistent economic contraction over the seven years, diverging from the broader post-pandemic recovery seen in other sectors. Unlike the "U-shaped" rebound often observed in manufacturing, Forestry output has trended downward from its peak in 2017 ($6.7 million) to a period low of $5.0 million in 2023. While employment proved relatively resilient, fluctuating tightly between 84 and 94 jobs before settling at 88 in 2023, it has not driven corresponding growth in economic value. This divergence points to a significant erosion in labor productivity. In 2017, the sector generated approximately $71,300 in output per worker. By 2023, this figure had declined to roughly $56,800 per worker.

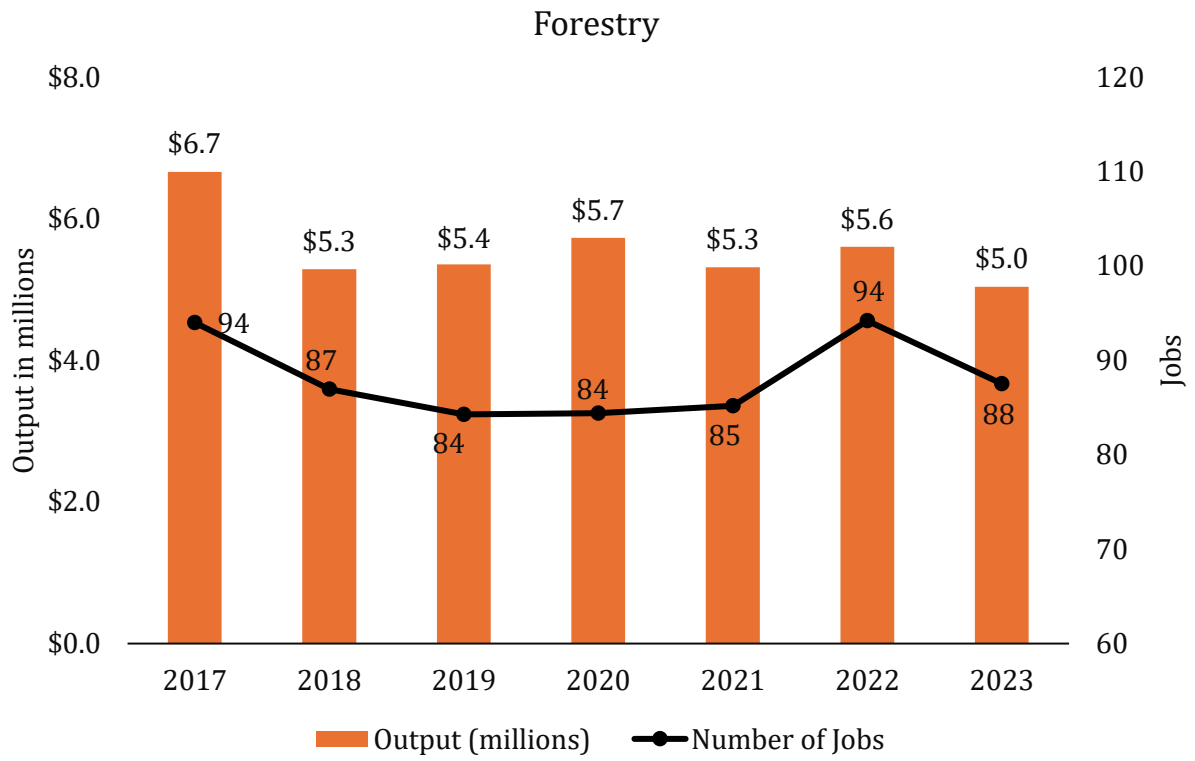

Figure 6: Trend in direct employment and output for the Forestry industry in Iowa, 2017–2023.

Logging

Economic Contribution of Logging

Table 6 outlines the economic contributions of the Logging industry group, which for Iowa is comprised of the Commercial logging sector (Sector 16). This sector is engaged in cutting timber, transporting logs, and producing wood chips in the field. In 2023, Logging served as a vital source of rural economic activity, directly employing 584 individuals. The industry

generated $93.6 million in direct output and contributed $91.2 million in Value-Added to the state's economy.

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

	Employment	Labor Income	Value-Added	Output
Direct	584	$36,684	$91,243	$93,632
Indirect	10	$583	$781	$1,204
Induced	141	$7,225	$14,161	$23,320
Total	735	$44,492	$106,185	$118,156

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

The financial structure of Iowa's logging sector is unique compared to typical manufacturing industries. The data reveals an extremely high ratio of Value-Added to Output (97.4%), indicating that nearly the entire value of the timber harvested is retained as wealth rather than spent on intermediate inputs. Similarly, the Labor Income accounts for $36.7 million (roughly 39% of output).

The multiplier analysis characterizes Logging as a sector with distinct "household-driven" economic ripples rather than deep supply-chain integration.

- **Indirect Effect:** The indirect contribution is minimal, generating only $1.2 million in output. This suggests that the sector's spending on intermediate supplies, such as fuel and equipment maintenance, is either low relative to the value of the timber or leaks to suppliers outside the region.
- **Induced Effect:** In contrast, the induced effect is the dominant driver of secondary activity, generating $23.3 million in output. This confirms that the sector's economic impact is primarily propagated through the household spending of loggers and business owners rather than business-to-business transactions.

When these direct, indirect, and induced impacts are aggregated, the Logging industry contributed a total of 735 jobs, $118.2 million in output, and $106.2 million in value-added to the Iowa economy. The implied Output Multiplier is 1.26. This indicates that for every dollar of timber harvested, an additional $0.26 of economic activity is stimulated elsewhere in the state. Notably, this multiplier is lower than that of the Forestry sector (1.59), reflecting a lower propensity for intermediate spending and a value chain where the primary economic capture occurs at the point of harvest.

Trend Analysis: Logging (2017–2023)

As shown in Figure 7, the Logging industry in Iowa exhibits a striking divergence between workforce consolidation and explosive value growth. While Direct Employment has slowly contracted, falling from a peak of 667 jobs in 2018 to a period low of 584 jobs in 2023, Real Industry Output has surged, particularly in the post-pandemic era. After hovering between $40–$50 million from 2017 to 2020, output spiked dramatically, nearly doubling from $57.8 million in 2022 to $93.6 million in 2023. This inverse relationship signals a massive leap in labor productivity and capital efficiency. In 2017, the average output per worker was approximately $80,300. By 2023, this figure increased substantially to roughly $160,300 per worker. Despite the current market's success, the Logging sector faces significant hurdles with an aging workforce, as well as businesses reporting increasing difficulty recruiting drivers to haul logs and retaining the specialized, high-skill labor required for the demanding and dangerous task of harvesting trees in a cyclical market.

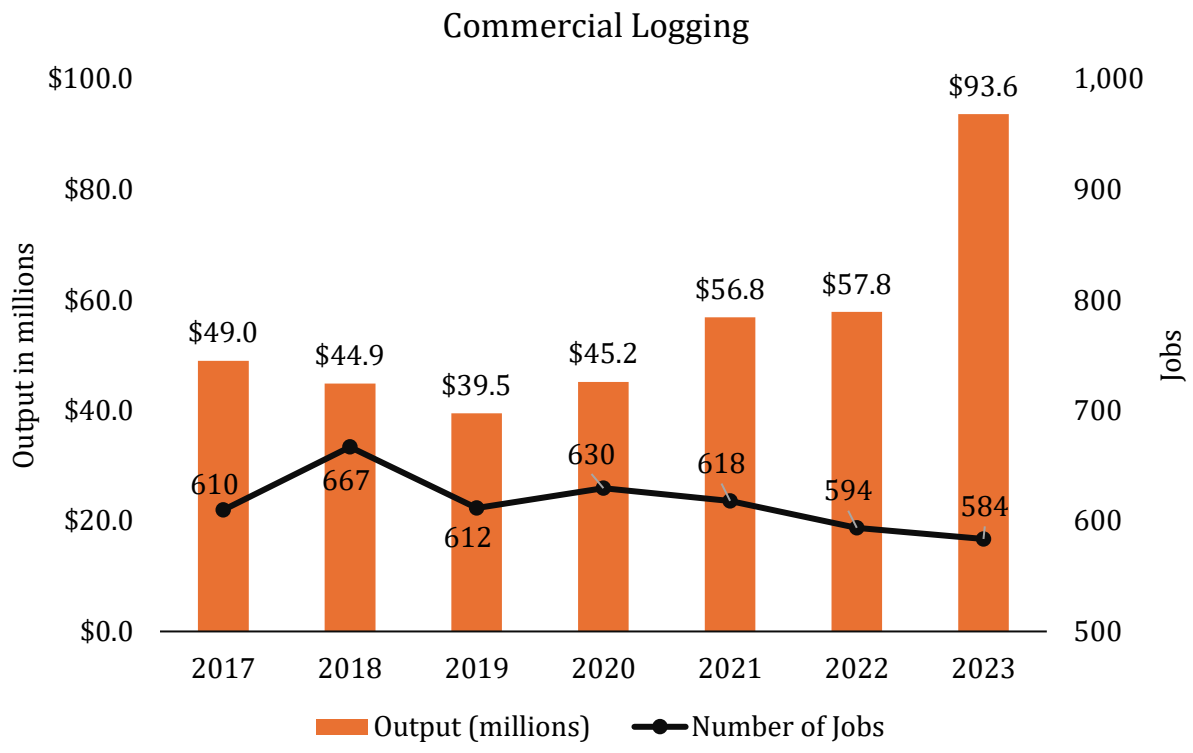

Figure 7: Trend in direct employment and output for the Logging industry in Iowa, 2017–2023.

Primary Solid Wood Products

Economic Contribution of Primary Solid Wood Products

Table 7 presents the economic contributions of the Primary Solid Wood Products industry group. In Iowa, this sector aggregates a specific range of manufacturing and energy activities,

including Electric Power Generation – Biomass, Sawmills, Wood preservation, and Veneer and Plywood manufacturing. Reconstituted wood product manufacturing is not disclosed in the Iowa dataset. Consequently, the economic activity reported here reflects the core processing of raw logs into lumber, energy, and structural panels, without the contribution of particleboard or fiberboard production.

In 2023, this processing hub directly employed 480 workers and generated $235.3 million in direct output. The data reveals an exceptionally high level of capital intensity and operational efficiency. The sector generates approximately $490,000 in output per worker. This suggests a production model driven by advanced machinery, where a relatively small, skilled workforce oversees significant throughput of high-value materials.

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

	Employment	Labor Income	Value-Added	Output
Direct	480	$33,283	$48,473	$235,316
Indirect	492	$34,791	$68,092	$109,941
Induced	251	$12,880	$25,259	$41,570
Total	**1,223**	**$80,954**	**$141,824**	**$386,827**

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

The Primary Solid Wood Products industry exhibits profound backward linkages, acting as a critical demand driver for upstream operations. A pivotal structural dynamic is evident in the employment data: the Indirect Employment effect supports 492 jobs, a figure that actually exceeds the sector's own direct workforce of 480. This results in a robust Employment Multiplier of 2.55. Essentially, for every 100 direct jobs in primary wood manufacturing, an additional 155 jobs are supported elsewhere in the state economy. This underscores the sector's function as a "keystone" industry; its operational demands are large enough to sustain a net-larger network of loggers, truckers, and maintenance contractors than the manufacturing workforce itself.

When aggregating direct, indirect, and induced effects, the Primary Solid Wood Products industry contributed a total of 1,223 jobs, $386.8 million in output, and $141.8 million in value-added to the state economy in 2023. By supporting over 1,200 jobs statewide, this industry anchors the regional forest value chain, effectively transforming raw natural resources into widespread economic activity across Iowa's industrial ecosystem.

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

As illustrated in Figure 8, the Primary Solid Wood Products sector in Iowa has undergone significant structural consolidation, resulting in a leaner, more efficient industrial base. The workforce exhibited a general downward trend, contracting by approximately 18.6% from 590 jobs in 2017 to 480 in 2023. However, this reduction in jobs did not correspond to a decline in production capacity. In fact, real industry output grew from $222.6 million in 2017 to $235.3 million in 2023, with a notable, albeit temporary, surge to $313.4 million in 2018.

This divergence between contracting employment and rising output underscores a profound shift in labor productivity. In 2017, the average output per worker was approximately $377,300. By 2023, this metric rose to roughly $490,200 per worker, a 30% increase in efficiency. This trend suggests that Iowa's sawmills and wood preservation facilities have successfully substituted labor with capital, utilizing advanced processing technology to increase throughput while reducing reliance on manual labor.

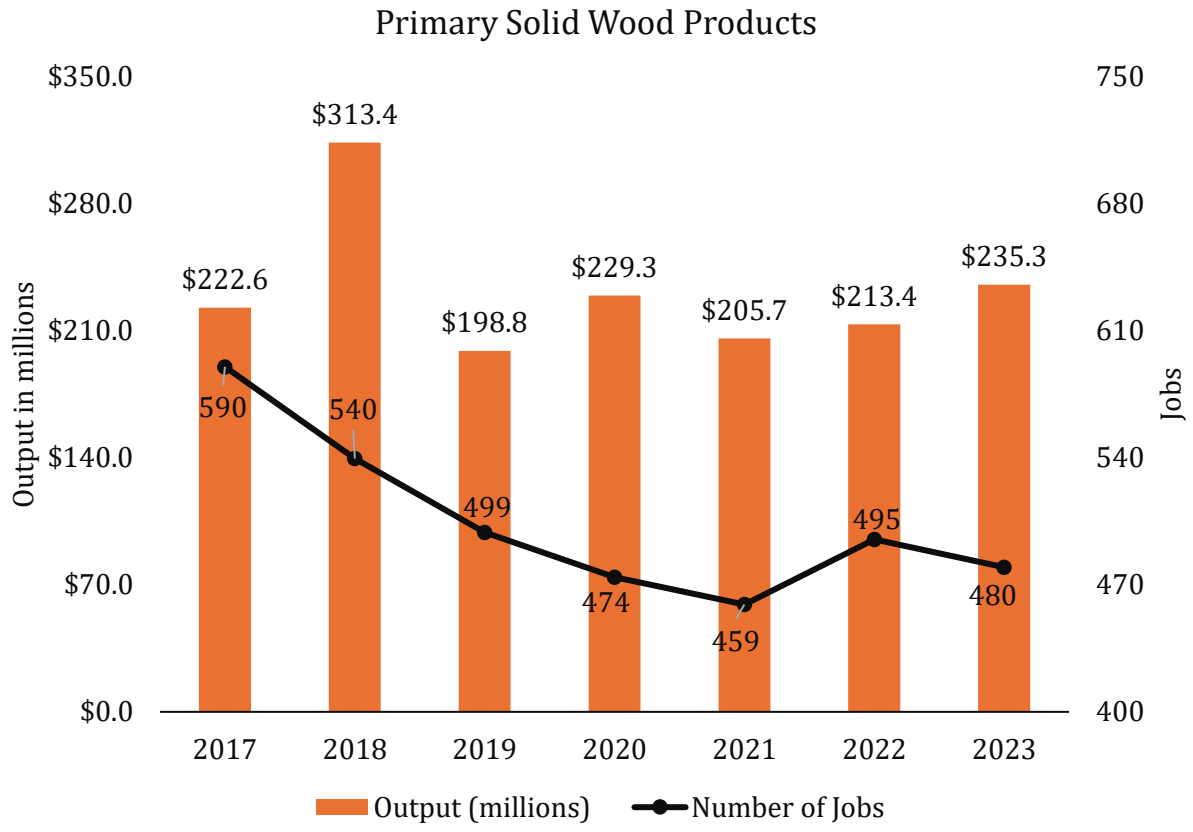

Figure 8: Trend in direct employment and output for the Primary Solid Wood Products industry in *Iowa*, 2017–2023.

Secondary Solid Wood Products

Economic Contribution of Secondary Solid Wood Products

Table 8 presents the economic contribution of the Secondary Solid Wood Products industry group. 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, and prefabricated wood building manufacturing. In 2023, this sector stood as the undisputed labor leader within the Iowa forest economy, directly employing 10,382 workers and generating nearly $3.31 billion in direct output.

The sector exhibits a moderate employment multiplier of 1.84, indicating that for every 100 jobs created in secondary manufacturing, roughly 84 additional jobs are supported elsewhere in the Iowa economy. While positive, this multiplier is notably lower than that of the Primary Solid Wood sector (2.55). 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 (4,148 jobs) is less than half the size of the direct workforce, contrasting sharply with the Primary sector where the indirect workforce actually exceeded the direct workforce.

When fully aggregated, the sector supports a total of 19,101 jobs and contributes nearly $5.01 billion in total economic output. Financially, the sector acts as an effective value generator, contributing a total of $2.10 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 approximately 34.6%, significantly exceeding the 20.6% observed in the Primary Solid Wood Products sector, illustrating the "value-lift" that occurs as wood moves downstream in the manufacturing process.

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

	Employment	Labor Income	Value-Added	Output
Direct	10,382	$950,102	$1,144,341	$3,309,017
Indirect	4,148	$295,374	$492,983	$944,821
Induced	4,572	$234,466	$459,933	$756,712
Total	**19,101**	**$1,479,942**	**$2,097,257**	**$5,010,550**

† 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 has served as the primary engine for employment growth within Iowa's forest sector, demonstrating remarkable workforce resilience even during periods of output volatility. Direct employment exhibited a near-continuous upward trajectory, growing by nearly 15% from 9,038 jobs in 2017 to 10,382 in 2023. Notably, the sector expanded its workforce even during the output contraction of 2021, peaking at 10,500 employees in 2022.

However, the relationship between labor and output reveals a significant temporary divergence in productivity. Between 2019 and 2021, real output plummeted from $3.18 billion to $2.64 billion, while employment continued to rise. This resulted in a sharp dip in labor productivity, falling to approximately $268,100 per worker in 2021. This trend corrected emphatically in 2023: as supply chains normalized, output surged by nearly $541 million in a single year to reach a period high of $3.31 billion. Consequently, productivity rebounded to approximately $318,700 per worker.

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

Wood Furniture

Economic Contribution of Wood Furniture

Table 9 details the economic contributions of the Wood Furniture industry group. This sector encompasses a wide range of value-added manufacturers, including those producing wood kitchen cabinets and countertops, upholstered and non-upholstered household furniture, institutional and office furniture, and custom architectural woodwork. In 2023, this sector directly employed 3,484 workers and generated over $741.6 million in direct output.

The data highlights that Wood Furniture manufacturing operates with a distinct economic structure compared to upstream processing sectors. While it is a manufacturing industry, it retains a significant labor component relative to its output. Approximately 29.5% of its direct gross output flows to workers as Labor Income ($218.5 million out of $741.6 million). This workforce dynamic heavily influences the sector's multiplier effects. The Employment Multiplier is 1.55, meaning that for every 100 direct jobs, an additional 55 jobs are supported elsewhere in the state. Notably, the Induced Employment effect (1,026 jobs) surpasses the Indirect Employment effect (896 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 5,407 jobs, $1.12 billion in output, and $485.0 million in value-added to the Iowa economy in 2023. While it generates less total output than the Secondary Solid Wood Products sector, it remains a vital, labor-centric pillar of the state's value-added manufacturing base, effectively converting processed lumber into high-value consumer and commercial goods.

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

	Employment	Labor Income	Value-Added	Output
Direct	3,484	$218,544	$275,155	$741,619
Indirect	896	$61,337	$106,601	$210,644
Induced	1,026	$52,659	$103,283	$169,959
Total	**5,407**	**$332,540**	**$485,039**	**$1,122,223**

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

Trend Analysis: Wood Furniture Industry (2017–2023)

As illustrated in Figure 10, the Wood Furniture industry in Iowa displays a pattern of gradual structural realignment, characterized by a slow contraction in the workforce alongside

stabilizing output levels. Direct employment has trended downward over the seven-year period, declining by approximately 7.1% from a peak of 3,758 jobs in 2018 to 3,484 jobs in 2023. Notably, the workforce has reached at this lower level, with employment figures for 2021 and 2023 being identical (3,484).

Despite the reduction in jobs, the sector's output has remained resilient, though it has cooled from its pandemic-era highs. Real industry output peaked in 2018 at $840.3 million and remained robust through 2020 ($804.1 million). However, recent years show a tapering effect, with output settling at $741.6 million in 2023.

This dynamic indicates a modest improvement in labor efficiency. In 2017, the average output per worker was approximately $194,500. By 2023, this figure rose to roughly $212,900. While not as dramatic as the shifts seen in the Logging or Primary Solid Wood sectors, this 9.5% productivity gain suggests that Iowa's furniture manufacturers have successfully maintained production values even with a leaner workforce.

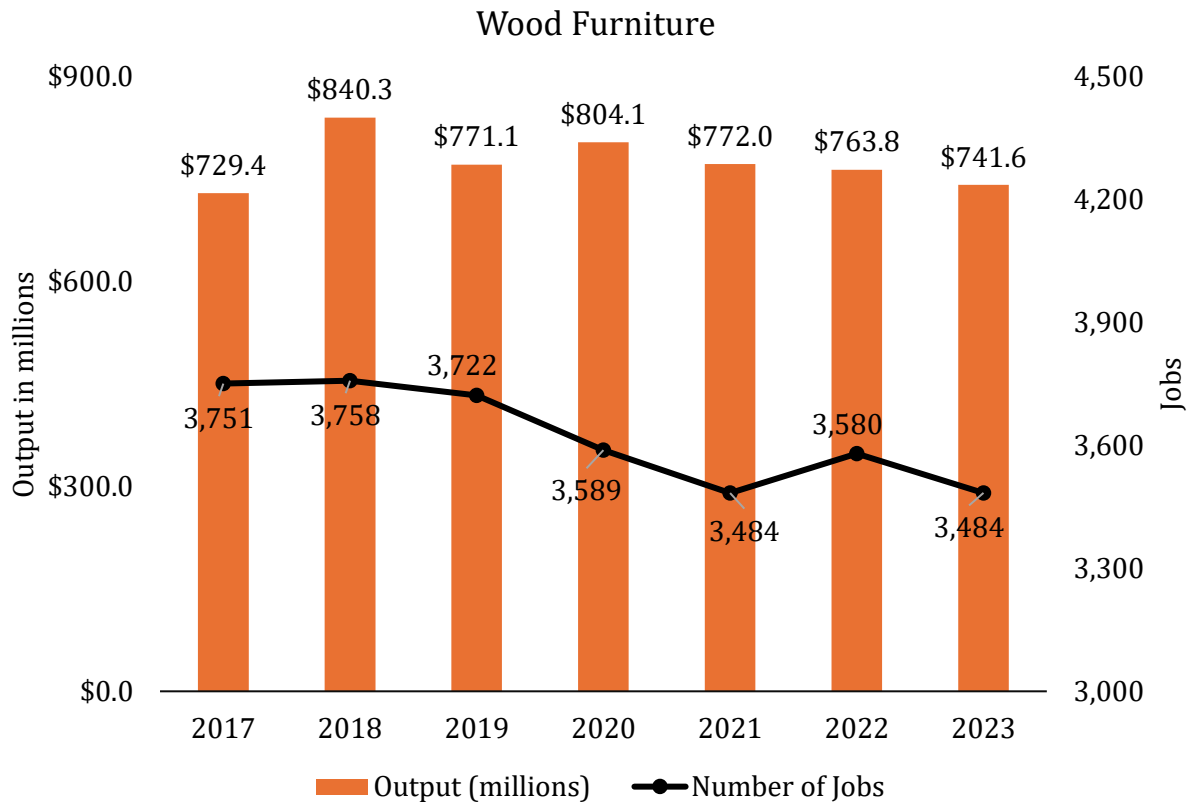

Figure 10: Trend in direct employment and output for the Wood Furniture industry in Iowa, 2017–2023.

Pulp, Paper, and Paperboard Mills

Economic Contribution of Pulp, Paper, and Paperboard Mills

Table 10 presents the economic contribution of the Pulp, Paper, and Paperboard Mills industry group. In the context of Iowa, data for Pulp Mills is not disclosed or present; therefore, this sector's activity is primarily driven by Paper Mills and Paperboard Mills. This group represents 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 Paper, and Paperboard Mills Industry in Iowa, 2023. †

	Employment	Labor Income	Value-Added	Output
Direct	244	$29,236	$105,711	$261,685
Indirect	318	$24,356	$45,118	$86,160
Induced	202	$10,339	$20,280	$33,371
Total	**764**	**$63,931**	**$171,109**	**$381,216**

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

In 2023, these facilities generated substantial financial flows despite a niche direct workforce. While directly employing only 244 workers, the sector generated over $261.7 million in Direct Output. This divergence, averaging over $1 million in output per worker, is the hallmark of advanced automation and continuous process manufacturing. The sector's direct Value-Added ($105.7 million) significantly exceeds its direct Labor Income ($29.2 million), underscoring that capital investment, including high costs for maintenance, energy, and raw materials, is the primary driver of operational expenditure, rather than direct labor volume.

A defining characteristic of this industry is its function as an economic anchor, where the supply chain workforce exceeds the workforce inside the facility itself. Specifically, the Indirect Employment (318 jobs) is notably larger than the Direct Employment (244 jobs). This demonstrates that the mills' intense operational requirements, demanding constant inputs of wood fiber, energy, process chemicals, and logistics, sustain a larger external workforce than exists on the factory floor. Consequently, the sector exhibits a powerful Employment Multiplier of 3.13. This is the highest multiplier in the entire forest economy, indicating that every 100 direct mill jobs support an additional 213 jobs elsewhere in the state.

When fully aggregated, the Paper, and Paperboard Mills sector supports a total of 764 jobs and generates $381.2 million in total economic output. Furthermore, the quality of direct employment in this sector is exceptional. With total direct labor income of $29.2 million distributed among 244 jobs, the average annual labor income per direct job is approximately

$119,800, showing the industry's role as a critical source of high-income, high-skill technical employment in Iowa..

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

As illustrated in Figure 11, the Paper, and Paperboard Mills sector in Iowa exhibits extreme volatility that diverges from standard cyclical economic patterns. The data is characterized by sudden, massive shifts in both employment and output, particularly in the final three years of the study. After a period of contraction during the pandemic (2020–2021), the sector seemingly exploded in 2022, with employment nearly quadrupling from 96 to 373 jobs and output surging from $117.6 million to $382.2 million. This was followed by a sharp correction in 2023, where employment settled at 244 jobs and output at $261.7 million. While the sector consistently demonstrates exceptional capital intensity, maintaining an output-per-worker ratio of over $1 million throughout the 2021–2023 period, the magnitude of these year-over-year swings necessitates cautious interpretation.

Note: *Such abrupt variances, particularly the tripling of the workforce in a single year followed by a 35% decline, may not reflect organic market dynamics alone. It is highly probable that these figures are influenced by external factors, such as industry reclassifications (e.g., a facility being re-categorized into or out of this sector), data reporting corrections, or distinct corporate restructuring events, rather than a typical expansion and contraction cycle.*

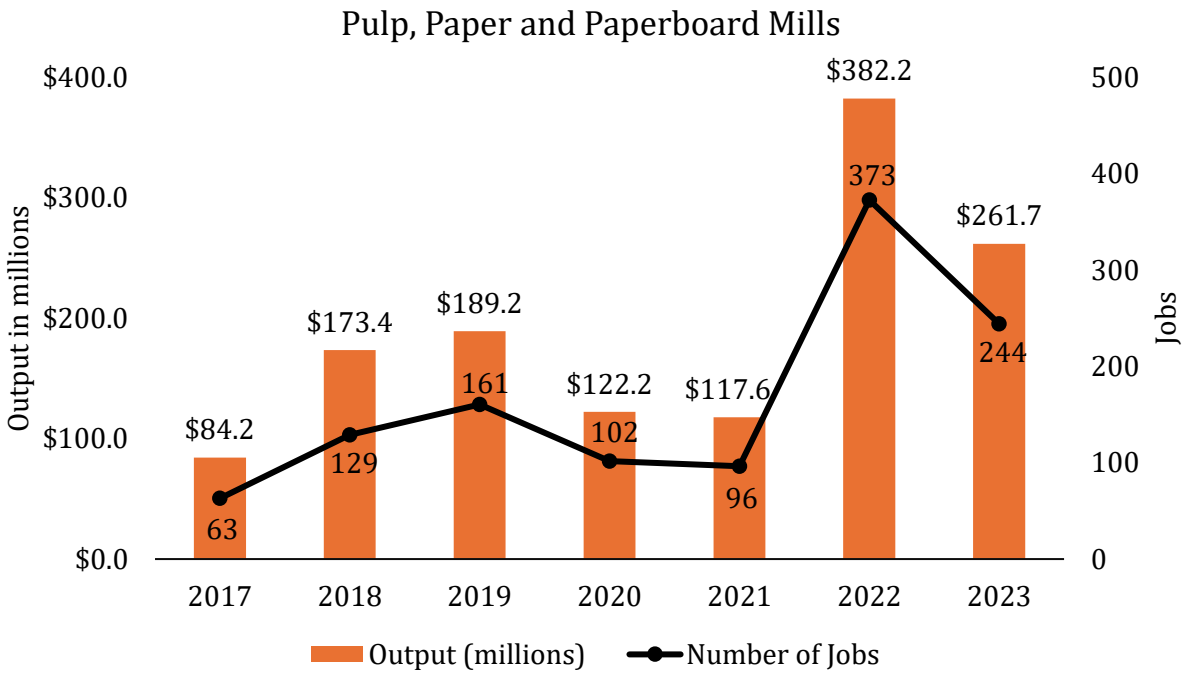

Figure 11: Trend in direct employment and output for the Paper, and Paperboard Mills industry in Iowa, 2017–2023.

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 group. This group is composed of "converters" that manufacture finished goods from purchased paper, paperboard, or recycled materials. Key activities include Paperboard container manufacturing, Paper bag and coated and treated paper manufacturing, and Stationery product manufacturing. As mentioned, data for Sanitary paper product manufacturing is not disclosed in the Iowa dataset; therefore, the analysis below reflects the state's packaging and industrial paper converting activities without the contribution of the sanitary tissue segment.

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

	Employment	Labor Income	Value-Added	Output
Direct	2,893	$270,677	$609,035	$1,783,195
Indirect	2,068	$148,804	$259,370	$478,659
Induced	1,545	$79,254	$165,728	$255,754
Total	**6,506**	**$498,734**	**$1,034,133**	**$2,517,608**

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

In 2023, this sector served as a significant manufacturing pillar, directly employing 2,893 workers and generating over $1.78 billion in direct output. The financial structure suggests a highly productive industry: the sector generates approximately $616,000 in output per worker, indicating that while it is more labor-oriented than the primary mills (Table 10), it remains a capital-intensive manufacturing environment heavily reliant on automated converting machinery.

The sector exhibits a robust Employment Multiplier of 2.25, meaning that for every 100 direct jobs in paper converting, an additional 125 jobs are supported throughout the state economy. A closer examination of the multiplier components reveals that the Indirect Employment effect (2,068 jobs) is the primary driver of this leverage, representing a workforce nearly 71% the size of the direct industry itself. This substantial indirect impact indicates that Iowa's converting facilities maintain strong, complex supply chain linkages. They act as major industrial customers, demanding high volumes of intermediate goods, specifically paper and paperboard from upstream mills, along with specialized logistics and packaging services to distribute finished containers.

In terms of total contribution, the Secondary Paperboard and Other Paper Products industry supports a total of 6,506 jobs and contributes over $2.51 billion in total economic output. By generating $1.03 billion in total Value-Added, this converting sector serves a vital intermediate role in the state economy.

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

As illustrated in Figure 12, the Secondary Paperboard and Other Paper Products industry in Iowa has experienced a sustained and significant contraction throughout the seven-year study period. Unlike other forest sectors that demonstrated post-pandemic resilience or cyclical recovery, this industry has seen a continuous erosion of both its workforce and productive capacity. From a peak of 3,688 jobs in 2017, direct employment has fallen every single year, reaching a low of 2,893 in 2023, a cumulative workforce reduction of nearly 22%. Real industry output mirrored this downward trajectory, declining from $2.56 billion in 2017 to $1.78 billion in 2023. While the rate of output loss stabilized somewhat between 2022 and 2023 (decreasing marginally by $7.3 million compared to the steep drops in previous years), the broader trend indicates a structural contraction. Furthermore, labor productivity has notably decreased; output per worker fell from approximately $694,000 in 2017 to $616,000 in 2023. This simultaneous decline in employment, output, and efficiency suggests the sector is facing persistent market constraints or consolidation pressures that have not yet abated.

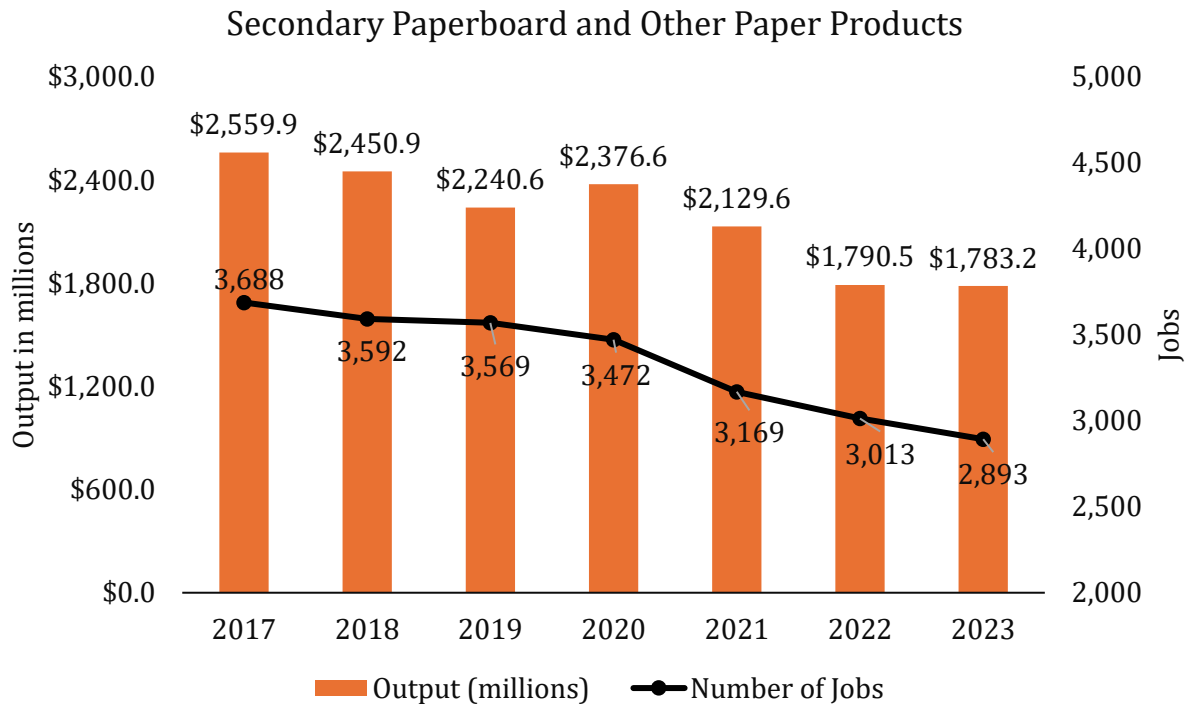

Figure 12: Trend in direct employment and output for the Secondary Paperboard and Other Paper Products industry in Iowa, 2017–2023.

Top Forest Product Sectors

Iowa's forest-products sector is represented by 28 IMPLAN industries, as four forest-related sectors, used for the analysis: All other crop farming (Maple syrup production), Reconstituted wood product manufacturing, Pulp mills, and Sanitary paper product manufacturing, are not present or their data is undisclosed in the state's 2023 industry mix. The economic profile of Iowa'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 8,205 workers and generating over $2.60 billion in direct output. This single industry accounts for a massive share of the sector's total capacity.

Iowa's extraction sector plays a significantly smaller role; Commercial logging does not appear in the top five for employment, output, or labor income, appearing only as the fifth-ranked industry for Value-Added ($91.2 million). This suggests a mature industrial ecosystem where the primary labor demand is driven almost exclusively by the processing and finishing of wood products.

However, the financial contributions reveal a distinct divergence between labor-intensive and capital-intensive sectors. While Wood kitchen cabinet manufacturing is the second largest employer (2,171 jobs), it drops to third in Output ($425.9 million) and Value-Added ($172.8 million). In contrast, the paper packaging sectors demonstrate significantly higher capital intensity. Paperboard container manufacturing ranks third in employment (1,806 jobs) but climbs to second place in both Output ($1.22 billion) and Value-Added ($405.3 million). Similarly, Paper bag and coated and treated paper manufacturing ranks fourth in Output ($345.6 million) and Value-Added ($138.1 million) despite not ranking among the top five employers. 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 Iowa state, 2023. †

Rank	Employment	Labor Income	Value added	Output
1	Wood windows and door manufacturing (8,205)	Wood windows and door manufacturing ($778,628)	Wood windows and door manufacturing ($934,072)	Wood windows and door manufacturing ($2,603,216)
2	Wood kitchen cabinet and countertop manufacturing (2,171)	Paperboard container manufacturing ($180,681)	Paperboard container manufacturing ($405,264)	Paperboard container manufacturing ($1,216,672)
3	Paperboard container manufacturing (1,806)	Wood kitchen cabinet and countertop manufacturing ($134,063)	Wood kitchen cabinet and countertop manufacturing ($172,844)	Wood kitchen cabinet and countertop manufacturing ($425,878)
4	Wood container and pallet manufacturing (929)	Engineered wood member and truss manufacturing ($67,606)	Paper bag and coated and treated paper manufacturing ($138,105)	Paper bag and coated and treated paper manufacturing ($345,573)
5	Engineered wood member and truss manufacturing (724)	Wood container and pallet manufacturing ($62,076)	Commercial logging ($91,243)	Engineered wood member and truss manufacturing ($297,911)

† 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

Excluding the forest-products industries themselves, Iowa included 441 other IMPLAN sectors in 2023. The forest sector exerted a broad economic influence, supporting at least one job in 189 industries and at least ten jobs in 121 of those sectors. In addition to the 18,154 direct jobs, the sector supported 14,917 indirect and induced jobs across the state's economy. These additional positions, 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 5,336 jobs. This represents approximately 35.8 percent of all indirect and induced employment generated by the forest economy.

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

Industries	Number of Jobs
Warehousing and storage	1,019
Truck transportation	746
Wholesale - Other durable goods merchant wholesalers	716
Other real estate	612
Full-service restaurants	468
Limited-service restaurants	440
Hospitals	359
Employment services	336
Retail - Food and beverage stores	324
Couriers and messengers	315
Total	**5,336**

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

- **Logistics and Commercial Trade:** The strongest linkages are found in the physical distribution of goods. Warehousing and storage rank as the single largest impacted sector, with 1,019 jobs supported. This likely reflects the substantial inventory requirements for lumber, millwork, and paper products. When combined with Truck transportation (746 jobs), Wholesale - Other durable goods merchant wholesalers (716 jobs), and Couriers and messengers (315 jobs), it is evident that the forest sector acts as

a primary driver of the state's logistics infrastructure. The industry requires a massive, reliable network to move raw timber to mills and distribute finished construction components to national markets.

- **Induced Household Spending:** The prominence of Other real estate (612 jobs), Hospitals (359 jobs), and dining establishments illustrates the "induced" purchasing power of the forest workforce. Full-service restaurants (468 jobs) and Limited-service restaurants (440 jobs) are sustained not by mill supply chains, but by the wages, salaries and income spent by forest-sector employees in their local communities. The high ranking of real estate and healthcare suggests that the income earned by loggers, mill workers, and manufacturers provides a critical revenue stream for maintaining local housing markets and essential community services.

- **Business Support Services:** Notably, Employment services (336 jobs) appears in the top ten. This indicates that Iowa's forest product firms are significant consumers of external staffing solutions to manage workforce fluctuations, relying on these agencies for administrative support and temporary labor to maintain operational flexibility.

In terms of economic output, the forest sector's influence shifts significantly toward high-volume trade, capital-intensive infrastructure, and financial services. As detailed in Table 14, the top ten non-forest industries supported by forest-sector activity generated a combined $1.21 billion in 2023.

The dominant category involves the wholesale distribution of goods, reflecting the 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 roughly $232.0 million in output. When combined with Wholesale - Other nondurable goods merchant wholesalers ($103.1 million), the wholesale trade sector alone accounts for over $335 million in economic activity.

The output rankings also underscore the substantial logistics and energy footprint of the forest economy. Truck transportation ranks as the second-largest supported sector overall, generating $166.8 million. This emphasizes the critical role of freight in the supply chain, moving raw timber to mills and finished products to market. Furthermore, Electric power transmission and distribution ranks eighth, contributing $91.6 million, a significant figure driven by the immense electricity consumption of the state's capital-intensive processing facilities and converting plants.

The presence of Owner-occupied housing as the third-largest supported sector ($160.1 million) is a significant indicator of the induced economic effect. In economic modeling, this sector

represents the imputed value of homeownership. This is further reinforced by the Other real estate sector ($105.1 million). Additionally, the sector supports $102.5 million for Monetary authorities and depository credit intermediation (banking and finance) and $70.3 million for Hospitals, reflecting the essential spending power and creditworthiness of the forest workforce within their local communities.

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

Industries	Output
Wholesale - Other durable goods merchant wholesalers	$231,997
Truck transportation	$166,844
Owner-occupied housing	$160,074
Other real estate	$105,119
Wholesale - Other nondurable goods merchant wholesalers	$103,073
Monetary authorities and depository credit intermediation	$102,470
Warehousing and storage	$100,067
Electric power transmission and distribution	$91,583
Management of companies and enterprises	$73,605
Hospitals	$70,288
Total	**$1,205,120**

† 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 Iowa's four primary natural resource sectors: Forest Products, Agriculture, Mining, and Commercial Fishing. The data indicates that while Agriculture is the undisputed volume leader in the state, the Forest Products industry remains a critical industrial employer and a stabilizing force within Iowa's natural resource base.

In terms of employment, the landscape is defined by the sheer scale of the Agriculture sector. It supports 104,894 jobs, accounting for roughly 82% of the total natural resources workforce. However, the Forest Products sector solidifies its position as the second-largest employer in this domain. With 18,154 jobs, the forest sector's workforce is more than triple that of the Mining, and Oil & Gas production sector (5,139 jobs) and vastly exceeds the niche Commercial Fishing industry (277 jobs). This establishes the forest industry as the primary alternative source of natural-resource-based employment outside of farming.

A comparison of Value-Added (GSP) reveals a distinct competitive dynamic regarding capital intensity. While the Forest Products sector contributed $2.28 billion to the state GSP, the Mining, Oil, and Gas sector surpassed it with a contribution of $2.36 billion. This occurred despite Mining employing less than 30% of the workforce size of the forest sector. This discrepancy highlights the extreme capital intensity of the Mining sector, where massive physical capital investments drive high value-added per worker ($458,000) compared to the more labor-diversified forest products industry ($125,000 per worker).

The comparative trend analysis underscores the Forest Products sector's role as a unique source of economic stability. Over the study period, other natural resource sectors exhibited extreme volatility or massive inflationary growth. The Mining sector experienced explosive expansion, with Output surging by over 406% and Value-Added increasing by 464% since 2017. Similarly, the Agriculture sector saw its Labor Income rise by 88.5% despite a contraction in employment. In stark contrast, the Forest Products sector demonstrated remarkable consistency. Its employment grew by a modest 1.8% and output increased by 3.0%. In an environment where other resource sectors are subject to boom-and-bust cycles or massive valuation shifts, the forest economy provides a reliable, steady foundation for the state's rural labor market.

Table 15: Natural Resources and Agricultural Production Industries in Iowa state, 2023. †

Industry	Employment	Δ2017††	Labor Income	Δ2017††	Value-Added	Δ 2017††	Output	Δ 2017††
1. Forest Products	18,154	1.8%	$1,543,125	12.8%	$2,278,717	1.9%	$6,429,516	3.0%
2. Commercial fishing, hunting & trapping	277	-30.0%	$378	-64.1%	$33,643	37.6%	$35,013	38.2%
3. Mining, and oil & gas production	5,139	8.4%	$507,702	140.1%	$2,356,105	464.1%	$4,717,370	406.6%
4. Agriculture production (plant crops and animals)	104,894	-1.8%	$10,850,782	88.5%	$16,627,202	68.6%	$39,171,955	9.8%
Total	**128,464**	**-1.0%**	**$12,901,988**	**75.9%**	**$21,295,666**	**69.8%**	**$50,353,854**	**17.5%**

† 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 Iowa's industrial base, Table 16 compares the aggregated "Forest Products manufacturing" contribution 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 dominant volume leader, it functions as a critical mid-tier anchor within a diversified advanced manufacturing economy.

In terms of employment, Forest Products Manufacturing employed 17,472 workers in 2023, ranking fourth among 16 manufacturing industries and accounting for approximately 7.7 percent of total manufacturing employment statewide. Employment levels exceed those in Transportation Equipment Manufacturing (11,950 jobs), Chemical Manufacturing (11,735 jobs), and Computer and Electronic Product Manufacturing (11,601 jobs). The largest employers remain Food Manufacturing (64,728 jobs) and Machinery Manufacturing (40,234 jobs), which together account for nearly half of total manufacturing employment.

From an output perspective, Forest Products Manufacturing generated approximately $6.32 billion, ranking sixth overall and representing about 4.2 percent of total manufacturing output. Output levels are comparable to Computer and Electronic Product Manufacturing ($6.25 billion) and exceed those of Plastics and Rubber Products, Electrical Equipment Manufacturing, and Nonmetallic Mineral Products. At the same time, output remains well below that of Food Manufacturing ($55.8 billion) and Chemical Manufacturing ($18.4 billion), which dominate total production.

Forest Products Manufacturing contributed $2.18 billion in value added, ranking sixth among manufacturing industries, and approximately $1.50 billion in labor income. On a per-worker basis, the sector generated roughly $362,000 in output per employee and $125,000 in value added per employee. Overall, the data indicate that Forest Products Manufacturing occupies a strong mid-tier position within Iowa's manufacturing economy. The sector combines relatively high employment with moderate-to-strong output and value added, contributing meaningfully to the state's manufacturing base without being among the largest volume-producing industries.

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

Manufacturing Industries	Employment	Labor Income	Value Added	Output
Food	64,728	$5,527,035	$9,550,291	$55,846,844
Fabricated Metal	40,234	$4,338,009	$9,428,984	$26,818,830
Computer and Electronic Product	21,452	$1,706,756	$2,631,131	$7,492,141
Machinery	17,472	$1,500,818	$2,178,438	$6,319,550
Forest Products	11,950	$969,741	$1,365,994	$5,567,789
Miscellaneous	11,735	$2,412,210	$7,180,849	$18,406,188
Printing	11,601	$1,489,922	$2,373,201	$6,253,409
Plastics and Rubber Products	8,604	$649,767	$911,257	$3,607,732
Transportation Equipment	7,262	$762,420	$1,715,726	$7,560,058
Chemical	7,087	$767,857	$1,130,099	$2,649,080
Nonmetallic Mineral Product	6,585	$397,834	$705,092	$1,387,076
Electrical Equipment	6,326	$554,699	$893,986	$2,999,224
Beverage and Tobacco Product	5,814	$502,136	$959,626	$2,673,468
Textiles and Apparel	3,151	$175,066	$392,292	$1,525,146
Primary Metal	2,038	$108,906	$117,499	$347,984
Petroleum and Coal	408	$933,499	$303,239	$1,281,541
Total	226,448	$22,796,676	$41,837,705	$150,736,059
Compared to 2017	1.4%	3.2%	2.9%	2.5%

† 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 Iowa's industrial base and a high-value engine for its economy. Navigating a landscape defined by post-pandemic adjustments and shifting market demands, the sector has demonstrated remarkable resilience, expanding its workforce and maintaining consistent output levels despite broader economic volatility.

In 2023, the Forest Products sector directly employed 18,154 individuals and generated $6.43 billion in direct economic output. The sector's influence extends deeply into the broader state economy; when accounting for indirect supply chain purchases and induced household spending, the total contribution reached 33,071 jobs and $9.33 billion in total output. This indicates a robust employment multiplier of 1.82. Essentially, for every 100 direct jobs in the forest sector, an additional 82 jobs are supported elsewhere in the Iowa economy, reflecting the deep integration of forest industries with local logistics, utilities, and wholesale trade sectors.

The industry exhibits a distinct structural emphasis on value-added manufacturing rather than raw extraction. Iowa's forest sector is defined by advanced processing. The Secondary Solid Wood Products group stands as the undisputed employment driver, supporting 10,382 jobs. Furthermore, despite employing a niche workforce, the Paper, and Paperboard Mills sector remains a capital-intensive powerhouse. It generated over $261 million in direct output with only 244 workers, highlighting the high automation and value-generation capacity of the state's processing facilities. When analyzing the specific, unaggregated industries, Wood windows 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 direct employment, while Paperboard container manufacturing demonstrates high capital intensity, ranking second in output, labor income, and value-added.

Within Iowa's natural resource-based economy, the forest products sector represents a source of relative stability. While mining experienced explosive inflationary growth and agriculture output fluctuated, forest products employment demonstrated steady, organic growth, rising by 1.8% since 2017. Within the broader manufacturing sector, forest products occupies a solid mid-tier position, ranking as the fourth-largest manufacturing employer with 11,950 jobs (specifically in manufacturing industries) and the sixth-largest producer by output.

The study period (2017–2023) reveals a divergence in productivity trends. While traditional sectors like Forestry faced headwinds, the Logging sector achieved massive gains in per-worker productivity, doubling its output per worker. Simultaneously, the Secondary Solid Wood Products sector drove state job growth. Ultimately, by converting renewable resources into

high-value construction components, 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 Iowa’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 Iowa.

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.
Sectors denoted by "***" indicate that the corresponding FPI is not present in Iowa.

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

Sectors denoted by "***" indicate that the corresponding FPI is not present in Iowa.

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

Sectors denoted by "***" indicate that the corresponding FPI is not present in Iowa.

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	13	$1,026	$1,058	$1,190
Support activities for agriculture and forestry	74	$3,574	$3,700	$3,861
Total	**88**	**$4,600**	**$4,759**	**$5,051**

† 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	584	$36,684	$91,243	$93,632
Total	**584**	**$36,684**	**$91,243**	**$93,632**

† 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	11	$1,024	$4,278	$11,283
Sawmills	410	$27,281	$36,440	$192,599
Wood preservation	22	$1,701	$3,181	$17,738
Veneer and plywood manufacturing	36	$3,277	$4,574	$13,697
Reconstituted wood product manufacturing	0	$0	$0	$0
Total	**480**	**$33,283**	**$48,473**	**$235,316**

† 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	724	$67,606	$83,599	$297,911
Wood windows and door manufacturing	8,205	$778,628	$934,072	$2,603,216
Cut stock, resawing lumber, and planing	22	$1,196	$1,698	$7,567
Other millwork, including flooring	106	$7,888	$10,492	$33,319
Wood container and pallet manufacturing	929	$62,076	$72,205	$232,799
Manufactured home (mobile home) manufacturing	60	$3,430	$3,789	$17,109
Prefabricated wood building manufacturing	241	$24,099	$32,069	$92,862
All other miscellaneous wood product manufacturing	95	$5,178	$6,416	$24,234
Total	**10,382**	**$950,102**	**$1,144,341**	**$3,309,017**

† 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	2,171	$134,063	$172,844	$425,878
Upholstered household furniture manufacturing	7	$237	$304	$1,357
Non-upholstered wood household furniture manufacturing	146	$7,528	$9,280	$26,661
Institutional furniture manufacturing	193	$11,850	$14,991	$44,516
Wood office furniture manufacturing	251	$16,527	$24,453	$68,703
Custom architectural woodwork and millwork	334	$23,048	$16,403	$68,942
Showcase, partition, shelving, and locker manufacturing	382	$25,290	$36,879	$105,562
Total	**3,484**	**$218,544**	**$275,155**	**$741,619**

† 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	0	$0	$0	$0
Paper mills	131	$15,194	$56,462	$135,593
Paperboard mills	113	$14,041	$49,249	$126,092
Total	**244**	**$29,236**	**$105,711**	**$261,685**

† 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	1,806	$180,681	$405,264	$1,216,672
Paper bag and coated and treated paper manufacturing	604	$56,091	$138,105	$345,573
Stationery product manufacturing	347	$23,843	$36,620	$152,143
Sanitary paper product manufacturing	0	$0	$0	$0
All other converted paper product manufacturing	137	$10,062	$29,047	$68,805
Total	**2,893**	**$270,677**	**$609,035**	**$1,783,195**

† 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	42	$1,585	$1,803	$2,904
Forestry, forest products, and timber tract production	52	$2,166	$2,215	$2,413
Support activities for agriculture and forestry	0	$0	$0	$0
Total	**94**	**$3,751**	**$4,018**	**$5,317**

† 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	610	$23,098	$25,669	$39,080
Total	**610**	**$23,098**	**$25,669**	**$39,080**

† 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	0	$0	$0	$0
Sawmills	518	$26,832	$30,167	$144,370
Wood preservation	45	$2,578	$4,301	$25,827
Veneer and plywood manufacturing	27	$1,514	$1,759	$7,383
Reconstituted wood product manufacturing	0	$0	$0	$0
Total	**590**	**$30,924**	**$36,226**	**$177,580**

† 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	756	$48,955	$53,481	$175,056
Wood windows and door manufacturing	6,407	$459,162	$557,704	$1,566,056
Cut stock, resawing lumber, and planing	60	$2,507	$3,152	$12,883
Other millwork, including flooring	251	$15,508	$19,764	$54,842
Wood container and pallet manufacturing	1,122	$54,723	$62,057	$176,425
Manufactured home (mobile home) manufacturing	14	$722	$927	$3,180
Prefabricated wood building manufacturing	283	$17,803	$19,534	$51,675
All other miscellaneous wood product manufacturing	144	$6,100	$6,935	$24,436
Total	**9,038**	**$605,481**	**$723,554**	**$2,064,553**

† 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	2,665	$118,969	$140,831	$381,683
Upholstered household furniture manufacturing	84	$7,304	$9,184	$20,970
Non-upholstered wood household furniture manufacturing	341	$11,914	$16,973	$42,886
Institutional furniture manufacturing	96	$4,190	$5,345	$17,503
Wood office furniture manufacturing	210	$11,983	$21,816	$51,044
Custom architectural woodwork and millwork	104	$4,565	$5,707	$15,574
Showcase, partition, shelving, and locker manufacturing	250	$13,340	$18,249	$52,309
Total	**3,751**	**$172,265**	**$218,103**	**$581,969**

† 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	0	$0	$0	$0
Paper mills	0	$0	$0	$0
Paperboard mills	63	$5,560	$27,441	$67,209
Total	**63**	**$5,560**	**$27,441**	**$67,209**

† 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	1,922	$149,530	$346,808	$1,042,564
Paper bag and coated and treated paper manufacturing	1,212	$96,265	$333,003	$733,855
Stationery product manufacturing	396	$22,579	$73,933	$181,422
Sanitary paper product manufacturing	32	$2,370	$22,993	$39,879
All other converted paper product manufacturing	127	$6,934	$16,419	$44,774
Total	**3,688**	**$277,679**	**$793,156**	**$2,042,494**

† 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	42	$1,938	$2,204	$3,639
Forestry, forest products, and timber tract production	52	$2,649	$2,709	$3,024
Support activities for agriculture and forestry	0	$0	$0	$0
Total	**94**	**$4,587**	**$4,913**	**$6,663**

† 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	610	$28,242	$31,386	$48,980
Total	**610**	**$28,242**	**$31,386**	**$48,980**

† 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	0	$0	$0	$0
Sawmills	518	$32,808	$36,886	$180,942
Wood preservation	45	$3,153	$5,258	$32,369
Veneer and plywood manufacturing	27	$1,852	$2,150	$9,254
Reconstituted wood product manufacturing	0	$0	$0	$0
Total	**590**	**$37,812**	**$44,295**	**$222,564**

† 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	756	$59,858	$65,393	$219,401
Wood windows and door manufacturing	6,407	$561,431	$681,922	$1,962,770
Cut stock, resawing lumber, and planing	60	$3,066	$3,854	$16,146
Other millwork, including flooring	251	$18,963	$24,166	$68,735
Wood container and pallet manufacturing	1,122	$66,912	$75,879	$221,117
Manufactured home (mobile home) manufacturing	14	$883	$1,134	$3,986
Prefabricated wood building manufacturing	283	$21,768	$23,885	$64,765
All other miscellaneous wood product manufacturing	144	$7,459	$8,479	$30,626
Total	**9,038**	**$740,340**	**$884,712**	**$2,587,546**

† 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	2,665	$145,467	$172,198	$478,370
Upholstered household furniture manufacturing	84	$8,931	$11,229	$26,282
Non-upholstered wood household furniture manufacturing	341	$14,568	$20,754	$53,750
Institutional furniture manufacturing	96	$5,123	$6,535	$21,937
Wood office furniture manufacturing	210	$14,651	$26,674	$63,974
Custom architectural woodwork and millwork	104	$5,582	$6,978	$19,520
Showcase, partition, shelving, and locker manufacturing	250	$16,311	$22,313	$65,560
Total	**3,751**	**$210,633**	**$266,681**	**$729,393**

† 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	0	$0	$0	$0
Paper mills	0	$0	$0	$0
Paperboard mills	63	$6,799	$33,553	$84,234
Total	**63**	**$6,799**	**$33,553**	**$84,234**

† 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	1,922	$182,835	$424,052	$1,306,666
Paper bag and coated and treated paper manufacturing	1,212	$117,706	$407,172	$919,755
Stationery product manufacturing	396	$27,608	$90,400	$227,380
Sanitary paper product manufacturing	32	$2,898	$28,115	$49,981
All other converted paper product manufacturing	127	$8,478	$20,076	$56,116
Total	**3,688**	**$339,526**	**$969,816**	**$2,559,899**

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