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Project Report

ECONOMIC CONTRIBUTION OF THE FORESTRY INDUSTRY IN VICTORIA

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Economic Contribution of the Forestry Industry to Victoria

A report for Forest and Wood Products Australia Limited

30 June 2025

Forest & Wood Products Australia

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Abbreviations

ABARES Australian Bureau of Agriculture and Resource Economics

ABS Australian Bureau of Statistics

fte full-time equivalent

GOS Gross Operating Surplus

GRP Gross Regional Product

GSP Gross State Product

I-O Input-Output

IOIG ABS I-O industry group

OVA Other Value Added

RISE Regional Industry Structure & Employment

SAGR South Australian Government Region

Acknowledgements

This study was funded by Forest and Wood Products Australia Limited. We thank Forest and Wood Products Australia for their support for the study. Many businesses in Victoria contributed considerable time to this study, providing detailed information about their operations and about the industry in the region more generally. We thank all those who provided their time, effort and expertise to inform the study.

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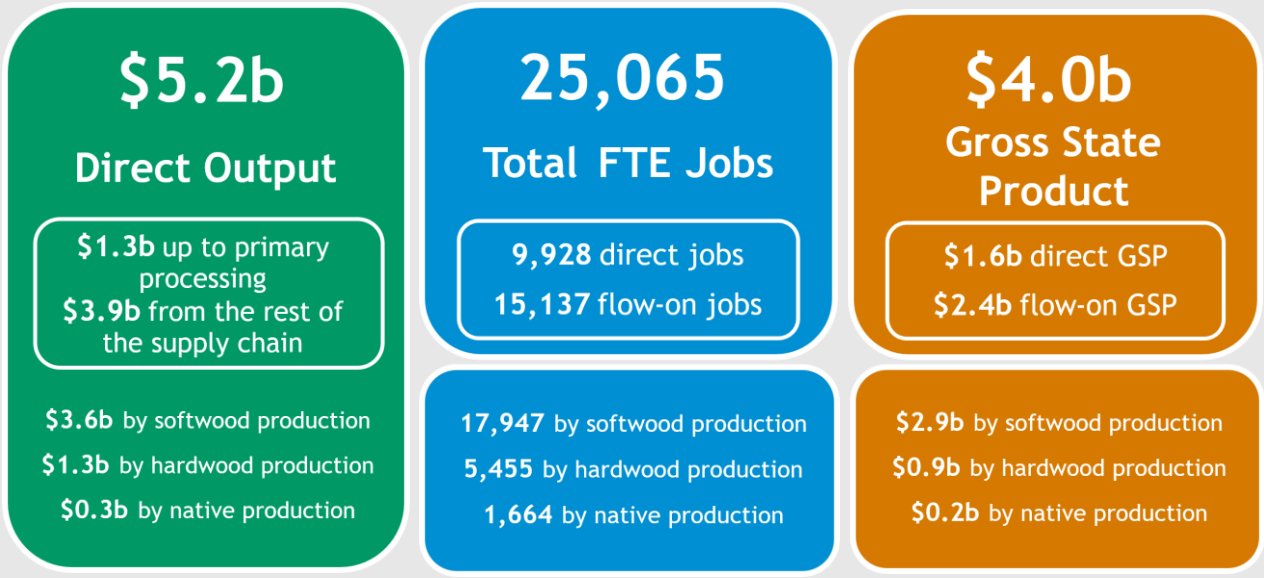
Economic contribution to Victoria in 2022-23

This summary outlines the economic contribution of locally grown logs processed through the Victorian supply chain in 2022–23. It excludes contributions from non-local timber (sourced from outside Victoria) and non-timber products.



Executive summary

The forest industry in Australia contributes to jobs, economic activity and social wellbeing in multiple regional communities and state economies. This contribution results from the growing, management and harvesting of plantations and native forests, and primary and secondary processing of logs into wood and fibre products such as sawn timber for use in construction, appearance products such as flooring and decking, woodchips for export, pulp and paper.

Forest and Wood Products Australia commissioned BDO to produce up-to-date information on the economic contribution of the forest industry in Victoria and South Australia for the 2021-22 and 2022-23 financial years. This report summarises the results of the study and presents findings for the forest industry in Victoria and its major regions. Primary data was collected through a survey of the forestry industry and supplemented by sources such as ABARES production and export statistics, ABS Australian Industry data, and the 2021 Census. The Victorian component of the Green Triangle is included within the scope of this report.

Native forestry in Victoria ended on the 31 December 2023, marking a significant shift in the Victorian forestry industry. The contribution of the native forest sector estimated in this report provides insight into the economic activity that will no longer exist beyond 2024, and separates the impact on direct roles in growing, processing, and related activities, as well as indirect impacts on local suppliers to the industry.

The report focuses on tracing Victorian grown logs through the local supply chain up to primary processing in 2021-22. Following the completion of the 2021-22 economic contribution analysis, this study was extended to include economic contribution indicators for 2022-23. The scope of the 2022-23 estimates was broadened to incorporate supply chain activity through to the final user. For the 2021-22, the final value included in the analysis is either the point the product exits the state, or the point at which the product reaches secondary processing. It is important to note that this excludes significant wood processing activities involving imported products, as well as activities beyond primary processing.

In addition to producing fibre to supply the wood processing industry, the forestry industry provides a base for other economic activities. The forestry sector in Victoria are involved in non-forestry activities such as livestock grazing, bee keeping, bushwalking, horse riding, camping, mountain biking and hunting, tourism, and firewood production. While the economic value of these activities has not been estimated as part of this report, these activities generate important additional economic benefit for many residents living in or visiting the regions.

A summary of the economic contribution results for the 2021-22 and 2022-23 financial years are presented below. To avoid double counting, direct output excludes payments made from one part of the industry to another. The indicators for 2021-22 include forest industry activity up to the point of primary processing. The indicators for 2022-23 also include supply chain activity through to the final user.

Economic contribution to Victoria in 2021/22

In 2021-22, the direct value of output generated by the Victorian forest industry up to the point of sale of primary processed products was $1,485.0 million (Table ES-1). Direct output measures the total revenue earned by forest industry businesses from sales of goods and services.

Alternatively, Gross State Product (GSP) identifies the extent to which the state benefited from the industry's activities in terms of return to business owners, wages and salaries and taxes, making it a preferred indicator of economic contribution. The industry's contribution to GSP was $1,687.1 million in total, including flow-on effects in the broader economy. This total included 54 per cent derived from softwood plantation activity, 25 per cent from hardwood plantation activity, and 21 per cent from native forest activity.

The forest industry in Victoria up to the point of primary processing supported a total of 11,512 fte jobs, including flow-on effects in the broader economy. This total included 5,703 fte jobs in the softwood plantation sector, 2,762 fte jobs in the hardwood plantation sector, and 3,047 fte jobs in the native forest sector. These 11,512 fte jobs were equivalent to 12,130 total jobs.

Table ES-1 Summary economic contribution of the forest industry to Victoria, by industry sector, 2021-22

	Softwood plantation	Hardwood plantation	Native forest	Total Victoria
Direct output ($m)	**811.5**	**382.3**	**291.1**	**1,485.0**
GSP ($m)	**914.7**	**417.4**	**355.1**	**1,687.1**
Direct ($m)	359.2	128.2	61.2	548.6
Flow-on ($m)	555.5	289.2	293.9	1,138.5
Household Income ($m)	**533.3**	**255.5**	**281.5**	**1,070.2**
Direct ($m)	203.1	79.0	106.4	388.4
Flow-on ($m)	330.2	176.5	175.1	681.8
Employment (fte)	**5,703**	**2,762**	**3,047**	**11,512**
Direct (fte)	1,928	713	1,038	3,678
Flow-on (fte)	3,776	2,049	2,009	7,834
Employment (total)	**6,039**	**2,897**	**3,193**	**12,130**
Direct (total)	2,081	771	1,089	3,941
Flow-on (total)	3,959	2,126	2,104	8,189

Source: BDO analysis

Economic contribution to regional Victoria in 2021-22

The forestry industry is important to regional Victoria through the economic activity and jobs it generates, both by the industry directly and through the suppliers it supports. The Regional Partnership regions[1] that contributed the most forestry activity to Victoria were Gippsland, Barwon, Great South Coast, and Ovens Murray, and the economic contribution to these regions is summarised below (Table ES-2). Due to confidentiality, all other regions are combined in the total reported in Table ES-1.

The direct value of output (sales) sales (output) generated by the regional Victorian forest industry was $565.9 million in Gippsland, $300.3 million in Barwon, $279.6 million in Great South Coast, and $332.3 million in Ovens Murray. The industry contributed a total gross regional product (GRP) of $338.6 million in Gippsland, $243.3 million in Barwon, $184.1 million in Great South Coast, and $135.7 million in Ovens Murray.

In terms of employment, the regional forest industry in Victoria supported a total of 2,747 fte jobs in Gippsland, 1,268 fte jobs in Barwon, 987 fte jobs in Great South Coast, and 1,059 fte jobs in Ovens Murray.

[1] Regional Partnership Regions are a regional classification used by Regional Development Victoria.

Table ES-2 Summary economic contribution of the forest industry to regional Victoria, by industry sector, 2021-22

	Gippsland	Barwon	Great South Coast	Ovens Murray
Direct output ($m)	**565.9**	**300.3**	**279.6**	**332.3**
GRP ($m)	**338.6**	**243.4**	**184.1**	**135.7**
Direct ($m)	140.6	158.3	121.8	69.8
Flow-on ($m)	198.0	85.0	62.2	65.9
Household Income ($m)	**264.6**	**114.8**	**92.0**	**103.9**
Direct ($m)	157.9	64.5	55.3	66.9
Flow-on ($m)	106.7	50.3	36.7	37.0
Employment (fte)	**2,747**	**1,268**	**987**	**1,059**
Direct (fte)	1,436	657	504	590
Flow-on (fte)	1,311	611	483	470
Employment (total)	**2,956**	**1,335**	**1,058**	**1,112**
Direct (total)	1,557	687	552	618
Flow-on (total)	601	236	226	165

Source: BDO analysis

2022/23 supply-chain analysis (study extension)

Following the completion of the 2021-22 economic contribution analysis, this study was extended to include economic contribution indicators for 2022-23. The scope of these estimates was broadened to incorporate supply chain activity through to the final user.

When interpreting the results, it is important to consider that the 2021-22 estimates are based on primary data collection for that specific year, involving over 90 businesses. The data collection and analysis method focused on accurately estimating the amount of local economic activity generated by locally grown products. In contrast, the 2022-23 analysis aimed to provide up-to-date information for a more recent year and to explore how publicly available secondary data could be used to understand activity along the supply chain. These estimates are valuable for understanding the volume of activity within local supply chains for local products and how economic contributions changed between years, though with a lower degree of accuracy.

In 2022-23, the direct value of output generated by the Victorian forest industry up to the point of sale of primary processed products was $1,347.9 million, and $5,235.5 million including downstream supply chain activity[2] (Table ES-3). The industry's contribution to GSP was estimated to be $4,008.2 million in total, including flow-on effects in the broader economy. This included $1,510.0 million supported industry up to the point of sale of primary processed products and $2,498.3 million supported downstream in the supply chain.

The forest industry in Victoria supported a total of 25,065 fte jobs, including flow-on effects in the broader economy. This included 9,327 fte jobs supported industry up to the point of sale of primary processed

[2] ABARES forest product industries data reported that Victoria's sales and service income for wood and paper products was $9.1b in 2022-23 (ABARES 2024). This includes non-local product, non-timber products produced at in scope businesses and double counting (transfers from one part of the industry to another). The ABS states that sales and service income should be used with caution due to high relative standard errors (ABARES 2024).

products and 15,738 fte jobs supported downstream in the supply chain. These 25,065 fte jobs were equivalent to 26,061 total jobs.

Table ES-3 Summary economic contribution of the forest industry to Victoria, including supply chain activity beyond primary processing, 2022-23

	Up to primary processing	Rest of supply chain	Total
Direct output ($m)	**1,347.9**	**3,887.5**	**5,235.5**
GSP ($m)	**1,510.0**	**2,498.3**	**4,008.2**
Direct ($m)	541.3	1,013.3	1,554.5
Flow-on ($m)	968.7	1,485.0	2,453.7
Household Income ($m)	**906.0**	**1,451.8**	**2,357.8**
Direct ($m)	325.0	581.7	906.7
Flow-on ($m)	581.0	870.0	1,451.1
Employment (fte)	**9,327**	**15,738**	**25,065**
Direct (fte)	3,033	6,896	9,928
Flow-on (fte)	6,295	8,842	15,137
Employment (total)	**9,842**	**16,219**	**26,061**
Direct (total)	3,266	6,816	10,081
Flow-on (total)	6,576	9,403	15,980

Source: BDO analysis

Limitations

An economic contribution analysis and the associated indicators aim to describe the existing amount of economic activity that is supported by a particular activity during a period of time. This is useful to produce a snapshot of the economic activity contributed by the forest industry in 2021-22 and 2022-23. When interpreting the economic contribution indicators, it is important to consider that these indicators cannot be directly applied to identify an expected change in economic activity given a change in forestry activity, such as the change due to natural disasters, biosecurity or regulation changes.

As the results in this report are a snapshot of the forest industry in 2021-22 and 2022-23, it is also important to consider the context of those years for the industry. For example, some relevant factors that would heavily influence the results year to year include restricted trade with China, supply and demand of timber products, investment and expansion in the industry, as well as innovation and new product development.

1. Introduction

The forest industry in Australia contributes to jobs, economic activity and social wellbeing in multiple regional communities and state economies. This contribution results from the growing, management and harvesting of plantations and native forests, and primary and secondary processing of logs into wood and fibre products such as sawn timber for use in construction, appearance products such as flooring and decking, woodchips for export, pulp and paper.

Forest and Wood Products Australia commissioned BDO to produce up to date information on the economic contribution of the forest industry in Victoria and South Australia for the 2021-22 financial year. This report summarises the results of the study and presents findings for the forest industry in Victoria and its major regions. The Victorian component of the Green Triangle is included in the scope of this report.

Victoria's forest industry is diverse, and includes wood and fibre production from native forest, hardwood plantations and softwood plantations. This report presents the economic contribution of Victoria's forest industry in terms of:

1. Output (sales)
2. Expenditure (by receiving industry)
3. Employment (total jobs)
4. Employment (full-time equivalent jobs)
5. Gross State Product (GSP) or Gross Regional Product (GRP)
6. Household Income

Results are presented separately by supply chain stage and industry sector where possible given confidentiality constraints.

Due to data gaps and uncertainties beyond the production of forest growing and management, the scope of the forest industry for the purpose of this report focuses on tracing Victorian grown logs through the local supply chain up to primary processing. In other words, the final value included in the analysis is either the point the product exits the state, or the point the product reaches secondary processing. It is important to note that this excludes significant wood processing activities involving imported products, as well as activities beyond primary processing.

Given the substantial activity beyond primary processing typically excluded in previous comparable studies, there was an interest in capturing more of the supply chain in this research. In addition to the analysis described above, this study also includes an extension, focused on understanding the economic contribution of the wider supply chain for the 2022-23 year.

1.1. Previous studies

In 2017, Forest and Wood Products Australia engaged the University of Canberra, working with BDO, to provide several socio-economic assessments of the forest industry. This included one for the Green Triangle region within South Australia and Victoria (Schirmer et al. 2017), and one for the forest industry in Victoria (excluding the Green Triangle) for the financial year 2015-16 (Schirmer et al. 2018).

This study produced comparable economic contribution results for the 2021-22 financial year, with some differences in the regional boundaries, methods, and scope. There have been some adjustments in the methodology, which means that while the studies are contextually comparable, the results should be interpreted with caution. The 2021-22 results are contextually compared to the 2015-16 results in Section 5.

It's important to note a key difference in scope between the previous studies and this research. The 2015-16 study of the forest industry in Victoria included forest industry activity not dependent on Victorian forests, including interstate activity and processing of imported product from overseas or interstate (Schirmer et al. 2018). This research focused on tracing locally produced forest products only, primarily due to data gaps.

1.2. Industry structure

The forest industry in Victoria, like most of Australia, has a supply chain with three distinct parts: primary production, primary processing and secondary processing. Each stage is described below:

1. **Primary production of wood and fibre products.**

In this part of the industry, trees are grown and harvested to produce roundwood (logs), in native forests and plantations. The activities involved in primary production include management of native forests and plantations by forest management businesses and agencies, silvicultural contractors, and harvesting and haulage of logs to primary processors by harvest and haulage contractors.

2. **Activity up to and including primary processing of wood and fibre products.**

Primary processing means processing of logs into initial products. This part of the industry is based mostly on wood and fibre grown in the Victora, with small volumes of logs and fibre products imported for processing from other regions. This means that the primary production of logs and primary processing combine to create a strongly inter-linked supply chain. This supply chain generates employment and economic activity based on the management and harvesting of mostly Victorian-grown logs for wood and fibre production from native forest and plantations. Harvested logs from native forest and plantations are processed from logs into a range of primary products including sawn timber, pulp and paper, particleboard, and woodchips. The products from primary processing are then either sold directly into end use markets such as the construction industry or sold for further processing into 'secondary' products by other processors.

3. **Secondary processing.**

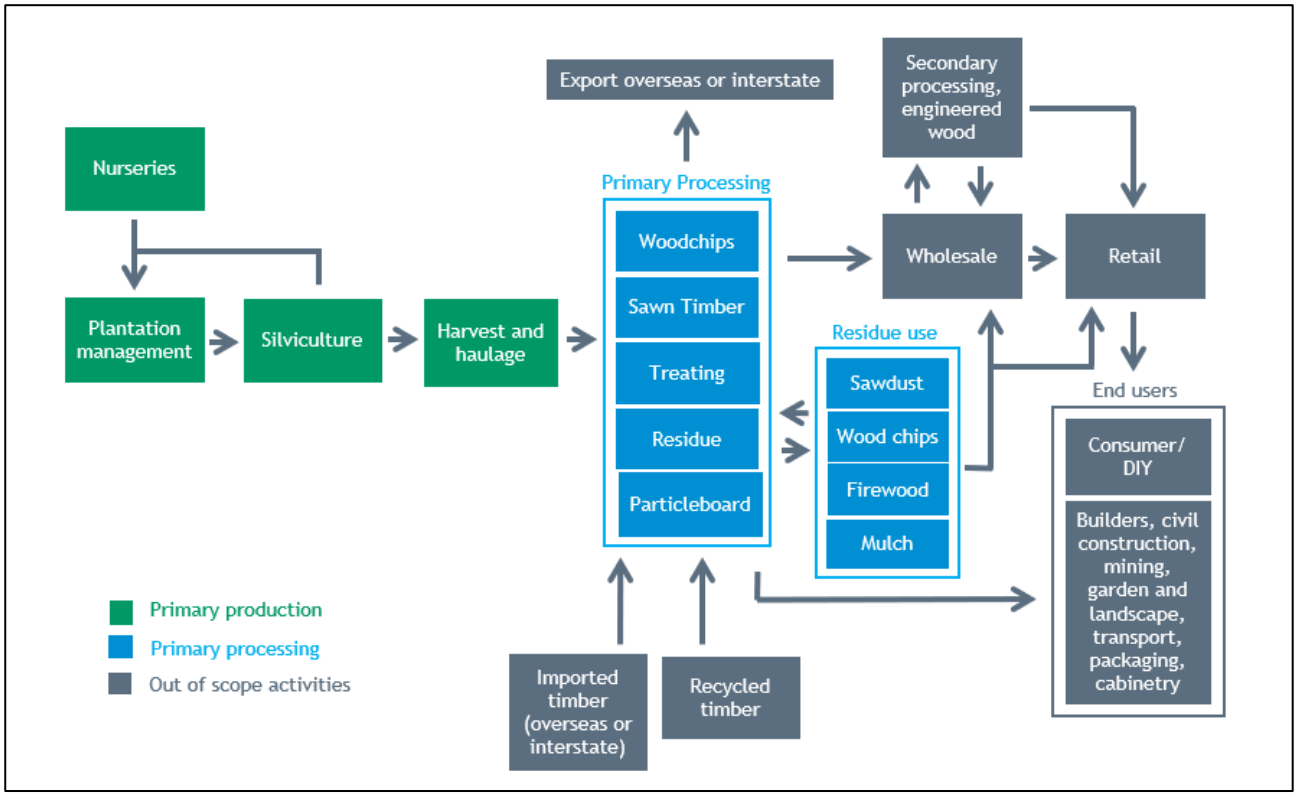
Secondary processing involves further processing of primary processed wood and fibre (for example, rough sawn timber or paper) into a range of further products such as engineered wood products, cabinets, furniture or paper packaging products. While these jobs still rely on wood and fibre as a key input in processing, the wood or fibre used is often combined with other products such as fabric covers on furniture or plastic components. The inputs may be sourced from timber grown locally, or from timber that has been grown and undergone primary processing in other parts of Australia or other countries. Additionally, some of the residues produced in primary processing (for example, bark, dust and docking ends of logs) are sold to businesses such as firewood sellers, agricultural businesses for use as animal bedding, garden and landscape businesses. Figure 1-1 provides a stylised representation of this structure.

Chapters 1 to 4 of this report focus primarily on understanding the employment and activity generated by the industry up to and including the 'primary processing' stage. The primary processing stage was defined for this report as including all processors who take roundwood (logs) harvested from forests and includes all products from those processors. In some cases, a single processor may process roundwood into multiple products on a single site, including engaging in some activities often considered part of the secondary processing sector. In these cases, all that processor's activities were included in the analysis. Importantly, the focus of this study was on locally grown timber within Victoria and the Green Triangle that is processed in Victoria. It excludes local processing of imported timber from overseas and other states. The study

acknowledges input from industry stakeholders regarding interstate supply, which are excluded from the estimates.

This study includes a case study that tracks the softwood product from processor to the final local user or consumer. The case study investigates the softwood structural timber supply chain, focusing on milling activity occurring in the Green Triangle flowing into the South Australian and Victorian supply chain. The case study allows for the economic activity associated with the out-of-scope activities depicted in grey in Figure 1-1 to be estimated. Given the complexities further down the supply chain and dispersion of the products, it is difficult to estimate these later stages of the supply chain with the level of confidence of the primary production and primary processing stages. The case study provides the opportunity to estimate the activity with more certainty and provides an illustration of the magnitude of the contribution of the later stages of the supply chain. The results of this case study are reported in a separate report (BDO 2025).

Figure 1-1 Stylised structure of the Victorian forest and wood products industry supply chain in Australia



1.3. Industry sectors

The native forest, softwood plantation and hardwood plantation industry sectors in Victoria each produces different types of products and services different markets. They are each described briefly below, followed by an overview of economic activities other than wood and fibre production that also occur in native forest and plantation areas in Victoria.

1.3.1. Native forest sector

During 2021-22 (the reference year of this study), the native forest industry in Victoria primarily relied primarily on harvesting from multiple-use public forests located in the east and northeast of the state. While nominally multiple-use state forests are available for timber harvesting the area available and able to be harvested was 140,000 ha over an 80-year rotation, with around 3,000 ha harvested on average each year. Native hardwood timber is used where durability and appearance are important traits (VFPA pers. comm).

In May 2023, the Victorian Government announced that it was bringing forward the cessation of native timber harvesting from 2030 to 31 December 2023, marking a significant shift in the Victorian forestry industry. As a result, VicForests will also cease to exist from the 30 of June 2024 (The Guardian 2023).

Data collection for the native forest sector was difficult given the challenges businesses were facing at the time of the survey, however, the estimated contribution of the native forest sector provides insight into the economic activity that will no longer exist beyond 2024.

As with the plantation sectors, the contribution of the native forest sector estimated in this report separates the impact on both direct roles in growing, processing, and related activities, as well as indirect impacts on local suppliers to the industry.

In 2021-22 Victoria's native forests yielded hardwood log production of 957,000 m^3. Of this production, 63 per cent consisted of pulplog, while 37 per cent comprised of saw and veneer log. The value of this production was equivalent to $97 million during 2021-22. Victoria's contribution represented 29 per cent of Australia's native hardwood log production volume and 28 per cent of its hardwood log production value for that year (ABARES 2024).

1.3.2. Softwood plantation sector

Softwood plantations in Victoria are clustered in several regions throughout the state.

- Green Triangle region: plantations are clustered near the South Australian border and support an industry that crosses the Victoria-South Australian border.
- Gippsland region: most softwood plantations are in Central Gippsland, predominantly in an area stretching from Bairnsdale in the east to Warragul in the west, with a much smaller area in East Gippsland.
- In a band through central Victoria from Wodonga in the north through to regions near Colac. This band of plantations includes what is commonly termed the 'Murray Valley' region in the northern part and the 'Central Victoria' part in the south.

In 2021-22, Victoria boasted 221,000 hectares of softwood plantations, accounting for 22 per cent of the total softwood plantation area across Australia. These plantations yielded a log production of 3,541,000 m^3 during the same period. Of this production, 52 per cent comprised of saw and veneer log, 45 per cent consisted of pulplog and the remaining 3 per cent includes poles, piles, fencing and other logs. The value of this production was equivalent to $325 million during 2021-22. Victoria's contribution represented 24 per cent of Australia's softwood log production volume and 26 per cent of its softwood log production value for that year (ABARES 2024). Softwood timbers are mostly used in the residential construction sector, and for landscaping and fencing materials.

1.3.3. Hardwood plantation sector

The majority of hardwood plantations in Victoria are located in the Green triangle region. Most hardwood plantation timber is either chipped during the harvest process (in-field chipping) and sent to export facilities or processed at woodchip mills for export for paper, cardboard and textile production purposes (Schirmer et al. 2017).

In 2021-22, Victoria had 159,300 hectares of hardwood plantations, accounting for 23 per cent of the total hardwood plantation area across Australia. These plantations yielded a log production of 2,319,000 m^3 during the same period. Of this production, 99 per cent of wood harvested was pulplog. The value of this production was equivalent to $194 million during 2021-22. Victoria's contribution represented 30 per cent of Australia's hardwood log production volume and 27 per cent of its hardwood log production value for that year (ABARES 2024).

1.4. Other activities

In addition to producing fibre to supply the wood processing industry, the forestry industry provides a base for other economic activities. The plantations in Victoria are involved in non-forestry activities such as livestock grazing, bee keeping, bushwalking, horse riding, camping, mountain biking and hunting. Publicly owned multiple-use native forests uses also include tourism, bee keeping, community firewood production, and a wide range of recreational activities and events including bushwalking, picnic and camping areas, bike riding trails, and four-wheel driving areas.

The economic value of these other activities has not been estimated as part of this report, which includes only the economic value of the wood and fibre products produced from plantation and native forest in Victoria. However, these other activities generate important additional economic benefit for many residents living in or visiting the regions.

1.5. Structure of the report

This report describes the methods, data and assumptions in Section 2. Economic contribution results for Victoria are presented in Section 3, first describing the direct activity contributed by the industry, followed by the total contribution supported by the industry. Section 4 presents similar results for the relevant Victorian Regional Partnership regions. A summary of the results including a contextual comparison to the previous study is provided in Section 6.

1.6. Regions

This report presents economic contributions for the relevant Victorian Regional Partnership regions, a regional classification used by Regional Development Victoria, and shown in Figure 1-2. The four regions that contributed the most forestry activity to Victoria in 2021-22 were Gippsland, Barwon, Great South Coast, and Ovens Murray. As such, the direct and flow on effects in these regions were estimated and are summarised in Section 4. There is also substantial forestry activity occurring in other Victorian Regional Partnerships that is not reported by region due to confidentiality constraints.

Figure 1-2 Map of Victorian Regional Partnerships

Source: Regional Development Victoria 2023

2. Method, data and assumptions

The methods for data collection included industry surveys, interviews, and workshops. This data was aggregated into a forest activity model using published aggregate production data before supply chain modelling and economic contribution analysis was applied. This section describes these components in more detail.

2.1. Data

Multiple data sources were used, including surveys, interviews and published data. The data sources are described below. Each dataset contained gaps that needed to be filled prior to economic contribution modelling. The approach taken to fill the data gaps in each source is also described below.

2.1.1. Industry survey

A two-stage survey approach was used to collect information from businesses in South Australia and Victoria up to and including primary processing as described below. The survey process for South Australia and Victoria was combined, including data collection for South Australia and the Green Triangle which are examined in a separate report (BDO 2025). Survey participation rates discussed below include those used in the analysis of the separate report.

1. **Stage one survey**

   This approach aimed to collect key and high-level information from a large number of businesses that would not have otherwise participated in a more detailed survey process. This information was used to help inform key aspects of economic modelling and support customisation of the stage two survey questionnaire (described below). Businesses were invited to participate through multiple email and phone call invitations as well as through the endorsement of various industry groups. They were invited to respond through an online form or over the phone. Most responses were provided over the phone. The survey collected information about location of offices, employment, total turnover, total costs, profitability and business activity descriptions. An extensive list of businesses were contacted, and a total of 90 businesses participated in the stage one survey. Once each interview in the stage one survey was complete, each business was advised that more detailed information would be collected from a select group of businesses and was invited to nominate themselves for the stage two survey.

2. **Stage two survey**

   At the successful completion of the stage one survey, each of the selected businesses were provided with a detailed questionnaire customised to suit their business operations (based on their stage one responses). Paper questionnaires and over the phone interviews were offered. Of the 90 businesses that participated in the stage one survey, 25 businesses provided more detailed information in the stage two survey. The questionnaire collected more comprehensive information for modelling such as:

   - Business details: name, locations, and business activities
   - Employment: number of workers by full-time and part-time, hours worked and usual residence
   - Financials: total business turnover and expenditure across 16 expenditure categories as well as the location of each supplier
   - Capital: capital expenditures over the last 5 years, location of each supplier
   - Supply chain activities: see Table 2-1 below.

Table 2-1 Data collected for supply chain specific activities, 2021-22 Industry Survey

Supply Chain Stage	Description
Forest management and growing	• Forest area managed and location by local government area • Volume sold to each business type
Silviculture	• Percentage of revenue earned in each activity type, region and industry sector
Harvest and haulage	• Percentage of revenue earned in each activity type, region and industry sector • Volume of forest resource harvested and/or hauled
Wood and paper processing	• Mill names and locations • Input volumes, mill-door prices and source regions • Total production volume, value and market destination (or final use) across product categories.
Other	• Percentage of revenue earned in each region and industry sector

Source: BDO analysis

Filling data gaps

Industry survey data was used as the basis of the model and provided useful information to assist in estimating the activity within each region by supply chain stage and industry sector. However, many individual businesses in the industry did not participate in the survey and several data sources were used to supplement missing business level information. Table 2-2 provides a summary of the data sources used and their application in the analysis.

Table 2-2 Summary of the data sources used and their application in the analysis

Source	Application
Industry survey	• Basis of the model. • Business level data provided by survey respondents was used to impute business operations of similar businesses who did not participate in the industry survey.
ABARES Australian forest and wood products statistics including production and exports (ABARES 2024)	• Production data was used to understand the size of the primary production activity by state and sector. Industry survey data was scaled up based on ABARES production data. • Export data was used to understand the amount of wood product exported from South Australia and Victoria that left the supply chain.
ABS Census of Population and Housing 2021, TableBuilderPro Place of Usual Residence database	• Business count by workforce size was used to understand the relative size of the industry and the businesses within it.
Socio-economic assessments of the Victorian and Green Triangle forest industry 2015-16 (Schirmer et al. 2018) (Schirmer et al. 2017)	• Results from these studies were used to benchmark the 2021-22 results and to impute business operations for businesses who did not participate in the industry survey.
Published business and industry level information from a range of sources	• A range resources such as annual business reports and published industry reports were used to impute business operations for businesses who did not participate in the industry survey.

2.2. Economic modelling

The economic contribution of the forest industry to Victoria was estimated using regional input-output analysis. This section describes the economic activity indicators estimated in this analysis and their components (direct, flow-on and total contribution).

2.2.1. Economic activity

Economic activity indicators: the focus of this report is the generation of economic activity resulting from the existence of the forest industry. The key economic activity indicators considered in the analysis are output, industry expenditure, gross state product (GSP), gross regional product (GRP), employment and household income.

Economic contribution: the existing (baseline) level of economic activity supported by an activity is referred to as economic contribution. In this analysis the concept of economic contribution includes the forest industry supply chain up to and including primary processing (unless specified) and the economic activity that supports it from all industries.

2.2.2. Indicators of economic activity defined

Output (Value of production) of an industry is a relatively simple measure. It is the total revenue earned by forest industry businesses from sales of goods and services. When reporting value of output, it is important to estimate value at a specific 'end point of sale' – i.e. a particular point in the supply chain. In this report, the 'end point of sale' is the value of the sale of goods from primary processing. This value excludes sales

of products and services between industry businesses at earlier points in the forest industry supply chain to avoid double counting. This value includes sales of intermediate products and services to businesses outside the Victorian forest industry, such as logs harvested in Victoria that are sold to processors outside of the region.

While this indicator provides a useful sales value at a particular stage of production – in this case, at the point of sale of primary processed wood products – it does not provide substantial information about how that industry contributes to the local economy, for two key reasons:

1. It doesn't consider the cost of producing the output. For example, an industry with a turnover (output) of $200 million and expenditure on goods and services of $150 million creates less value-add than one that has a turnover of $200 million and expenditure on goods and services of $100 million.
2. It matters where expenditures occur when considering flow-on effects. For example, an industry might generate $200 million of sales in a given region, but rely largely on imported goods and services to produce its output, generating very little local spending or employment as a result. Another industry, meanwhile, might also generate $200 million of sales, but do this through a locally based supply chain stage, generating substantial jobs and expenditure in the local area as a result.

Industry expenditure is a measure of how much is spent by the industry on goods and services as part of generating the final goods and services sold. When measured at regional level, this indicator provides an idea of the extent to which the industry contributes to the economy locally, as it will show how much the industry has spent within the region versus outside it. Value of expenditure can be measured in two ways, both of which are presented in this report:

1. *Gross expenditure* – total expenditure by all forest industry businesses, including spending within and outside the industry. This means some expenditure is 'double counted' as it involves 'within industry transfers'. For example, if expenditure by a wood processor purchasing logs from a plantation growing company is included as well as the expenditure incurred by that company in growing the plantations, this results in 'double counting': the gross expenditure includes the amount spent by the processor on the logs, and also includes the amount spent by growers to produce those logs. Because of this double counting, gross expenditure does not indicate the extent to which spending by the industry contributes to the broader economy.
2. *Net expenditure* – expenditure by the forest industry excluding transfers within the industry. This measure excludes payments made by businesses in one part of the industry to businesses in another part of the industry. It is a better indicator of the overall economic activity the industry contributes to the local economy.

Measures of expenditure differ to value of output, for a range of reasons. In particular, expenditure excludes business profits (which are captured in value of output), expenditure can sometimes be higher than value of sales over a given period depending on business investment and timing of production; and not all the expenditure used to produce a given amount of output will have occurred in the region in which expenditure is being estimated. For example, a business may have generated $1 million in sales in a given region, but only spend $200,000 in that region as part of generating those sales, with the business purchasing most goods and services from other regions as part of the production process.

Industry expenditure is a useful indicator and provides more concrete data on the extent to which production of wood products results in local economic activity compared to value of output measures. However, it is still subject to some problems of double counting: if the net expenditure of all industries in a region is added together, it will result in a value that is larger than the total value of production in that economy. This is due to the multiple transactions occurring between different industries in any given economy, some of which are double counted when expenditure of each individual industry is added together. This potential

for double counting means it is also important to identify the net contribution of the industry to a regional economy, after taking into account the interactions between all sectors of the economy. This is done through identifying industry contribution to Gross State Production (GSP), described below.

Employment units: Employment numbers are usually reported in either full time equivalent (fte) units or total job units defined as:

1. *fte*: is a way to measure a worker's involvement in a project or industry activity. An fte of 1.0 means that the person is equivalent to a full-time worker, while an fte of 0.5 signals that the worker is only half-time. Typically, different scales are used to calibrate this number, depending on the type of industry and scope of the analysis but the basic calculation is the total hours worked divided by average annual hours worked in full-time jobs.

   In this report, an fte of 1.0 was calculated as equivalent to a 37.5 hr working week.
2. *Jobs*: is used to refer to the number of workers employed (regardless of full- or part-time) in an industry or on a project at any point in time. It typically refers to either:
   - the maximum number of workers required at any point over the analytical period or the duration of the project; or
   - the *average* number of workers required over the analytical period/duration of the project. This can be calculated on a daily, weekly, monthly or annual basis.

In this report, employment is reported in terms of total and full-time equivalent jobs on a per annum basis.

Gross state product (GSP): is a measure of the contribution of an activity to the regional economy. GSP is measured as value of gross output (revenue) less the cost of goods and services (including imports) used in producing the output. In other words, it can be measured as the sum of household income, gross operating surplus and gross mixed income net of payments to owner managers and taxes less subsidies on products and production. It represents payments to the primary inputs of production (labour, capital and land). Using GSP as a measure of economic contribution avoids the problem of double counting that may arise from using value of output for this purpose. Gross regional product (GRP) is the equivalent of GSP at the regional level.

Household income: is income earned by employees of businesses and owner-operators. This is a component of GSP that describes how much of the GSP is passed directly to households so it is a useful indicator of the welfare of households.

2.2.3. Categories of economic activity

A useful way to think about economic contribution is using the concept of a 'supply chain'. The supply chain, in the context of the forest industry, includes forest management and silviculture, harvest and haulage of logs and transport of processed products, and primary processing.

Broadly speaking there are four categories of activity along the forestry supply chain.

1. *Direct activity* – refers to activity of firms, businesses and organisations that are directly engaged in providing goods and services to the industry. In this analysis this refers to all activity that handles forest resources from growing to processing.
2. *First round activity* - refers to activity of firms that supply inputs and services to the 'direct activity' businesses. For example, first round activity associated with harvest and haulage businesses includes fuel supply, repairs and maintenance to equipment and business administration services such as insurance services, legal services, communications and so on.

3. *Industrial-support activity* – refers to the 'second and subsequent round' effects as successive waves of output increases occur in the economy to provide industrial support, as a response to the original wave of expenditure.
4. *Consumption-induced activity* - is the term applied to those effects induced by the household income associated with the original expenditure and its flow-on effects. The expenditure of this increased household income, a result of all three categories of activity (direct, first round and industrial-support), will generate economic activity that will in itself generate further activity.

Flow-on (or *indirect*) *economic contribution* is the sum of categories 2, 3 and 4. In this analysis *direct (1)*, *production-induced (2+3)* and *consumption-induced (4)* activity is reported.

2.2.4. Economic contribution modelling

Over the past decade BDO has developed an extended input-output (I-O) model known as the RISE model (Regional Industry Structure & Employment). RISE models based on the 2021-22 financial year of Victoria, and the relevant Victorian Regional Partnerships were used for this analysis.

Input-output models are widely used to assess the economic contribution of existing levels of economic activity and the economic effects of shocks. The models are based on I-O tables that describe the interdependencies between industries within the regional economy and with the economy outside of the region. This makes the comprehensive economic framework provided by the RISE model useful for disentangling the direct and flow-on effects of activity in a regional economy.

The direct effect of supply chain activity up to and including primary processing (forest management and growing, wood and paper processing, harvest and haulage, silviculture and other) were determined using industry survey data (Section 2.1.1). To input this activity into the economic model, all activity needed to be allocated to a region and each expenditure item needed to be allocated to the appropriate producing industries.

The expenditures described above were transformed from producers' prices to basic prices to ensure flow-on effects were estimated accurately before they could be input into the RISE models. This transformation ensured margins were allocated to the appropriate industries, transfers along the supply chain were treated appropriately, taxes, subsidies and other forms of surplus transfer were identified, and imports were excluded from the estimation of state flow-on effects.

The transformed expenditure data were then used to shock the RISE model to estimate the flow-on and total economic contribution to the state economy at each supply chain stage. In the language of economics, to 'shock' a model is to take a description of some direct economic activity and input it into a model of the whole economy of interest to understand how the economic activity interacts with the whole economy.

2.3. Methodology improvements

In 2017, Forest and Wood Products Australia engaged the University of Canberra, working with BDO, to provide several socio-economic assessments of the forest industry. This included one for the Green Triangle region within South Australia and Victoria (Schirmer et al. 2017), and one for the forest industry in Victoria (excluding the Green Triangle) for the financial year 2015-16 (Schirmer et al. 2018).

There were several improvements to the economic contribution methodology between the 2015-16 and 2021-22 studies. When comparing results, it's important to consider that some observed change between the years is therefore attributable to these improvements. Key improvements include:

- The study was more focused on economic analysis. This allowed for the use of more detailed economic questionnaires that collected data specifically for the purpose of economic analysis.

- The data collection process was more strategic.
  - A two-stage survey approach was used to collect high level information from businesses who were unwilling to share more detailed information.
  - Data collection efforts were more targeted, and more responses were received from more substantial operators as a result.
- ABARES production data was able to be used to aggregate survey production data since the analysis was completed at the state level.
- The data was collected by the economists working on the analysis, allowing for more accurate scope determination for Victorian businesses.
- A case study was added to the scope for inclusion of the supply chain through to end use. This offers insights into the economic contributions beyond primary processing, which had not been previously estimated.

2.4. 2022/23 supply-chain analysis (study extension)

Following the completion of the 2021-22 economic contribution analysis, this study was extended to include economic contribution indicators for 2022-23. The scope of these estimates was broadened to incorporate supply chain activity through to the final user. This extension involved two additional methodological components:

1. Update the 2021-22 economic contribution model that was constructed with primary data for 2022-23 using aggregate production data.
2. Model the downstream supply-chain economic contribution using published statistics.

The 2022-23 analysis aimed to provide up-to-date information for a more recent year and explore how publicly available secondary data could be used to better understand local activity along the supply chain. A description of the approach applied to each of these two additional methodological components is outlined below.

2.4.1. 2022-23 update

The first step of the study extension was to update the 2021-22 economic contribution model for the 2022-23 year. Primary data collection was not within the scope of the extension. In its absence, aggregate production data and related assumptions were used to update the analysis. This component included updating the economic activity up to primary processing and the softwood structural timber post-mill estimates.

Data and assumptions

The key data source used to inform this update analysis was the ABARES Australian forest and wood products statistics, including production and exports (ABARES 2024). Data was available for 2021-22 and 2022-23, and the change between years was used to imply how activity by different businesses was likely to have changed.

Export data was used to understand the change in the amount of wood product exported from South Australia and Victoria that left the supply chain. Primary production data for each state and resource type was used to understand the change in the volume and value of the product between 2021-22 and 2022-23. The assumptions applied about the impacts of changes in the primary production volume and value across each business type up to primary processing for softwood and hardwood are summarised in Table 2-3.

The assumptions for native forest operators differ because native timber harvesting has ceased in the long-term. This means related activities are significantly impacted by short-term production changes as they transition out of the native forest industry. Consequently, the assumed impact is higher, and these assumptions are summarized in Table 2-5.

Table 2-3 Update assumptions, softwood and hardwood, 2021-22 to 2022-23

	Forest management and growing	Wood and paper processing	Harvest and haulage	Silviculture	Other
Revenue adjustment based on change in	Value	Volume	Value	Value	Value
Assumed impact on revenue (% weight)	100%	50%	75%	50%	20%
Cost and employment adjustment based on change in	Volume	Volume	Volume	Volume	Volume
Assumed impact on costs and employment (% weight)	20%	50%	75%	50%	20%

Source: BDO analysis

Table 2-4 Update assumptions, native forest, 2021-22 to 2022-23

	Forest management and growing	Wood and paper processing	Harvest and haulage	Silviculture	Other
Revenue adjustment based on change in	Value	Volume	Value	Value	Value
Assumed impact on revenue (% weight)	100%	100%	100%	100%	100%
Cost and employment adjustment based on change in	Volume	Volume	Volume	Volume	Volume
Assumed impact on costs and employment (% weight)	80%	100%	100%	100%	100%

Source: BDO analysis

The resulting estimated Green Triangle softwood processing revenue for 2022-23 was used as the new input to the softwood structural timber case study model. In the absence of updated primary data, all other inputs were held constant.

Economic contribution analysis

To estimate the associated economic contribution with the direct output of forestry products identified above, the economic modelling framework outlined in Section was applied. This involved transforming the direct activity for each sector into an expenditure 'shock' that could be applied to the RISE model.

To produce the 2022-23 update of the activity estimated in the 2021-22 components of the study, the method described in Section 2.2.4 was reapplied. This was done for both the up-to-primary processing activity and the post-primary processing activity for the structural softwood timber case study component of the supply chain.

2.4.2. Supply chain extension

The aim of the supply chain component of the extension was to explore how publicly available secondary data could be used to better understand activity along the forest and wood product supply chain. While the structural softwood timber supply chain case study was informed with primary data, this analysis attempted to estimate the additional post mill economic activity within Victoria using public data.

This approach maintained consistency with the study's aim of understanding the economic contribution of locally grown forestry products to the local area while expanding the scope by following the product further along the supply chain. Although national Input-Output (I-O) tables and BDO RISE models provide broad assumptions, they are not designed for this specific analysis. Therefore, the results have low certainty and lack detailed information on specific resource types.

Data and assumptions

National I-O tables (ABS 2024) were used to determine cost breakdowns of post mill supply chain stages. The key supply chain stages included in the analysis and their applications to the model are shown in Table 2-5, using the ABS I-O industry group (IOIG) classification. The output from this step was a complete set of production-based financial and employment models for key sectors involved in the forest and wood products supply chain in Victoria.

The Victorian RISE models developed by BDO were used to estimate supply chain flows through the local supply chain. These flow paths formed the basis for applying the above sector profiles. Product flows for each sector in Victoria are shown in Table 2-6 to Table 2-8. Note that all South Australian hardwood was assumed to flow directly to Victoria, generating no additional activity in South Australia but significant activity in Victoria.

Several assumptions were applied to incorporate the margin sectors from Table 2-5 (retail, wholesale and road transport) into the analysis and to estimate the direct output of these sectors associated with forest and wood products. These assumptions are as follows:

- Transport: At each point that product flowed from business to business, the transport margin was applied to the product value.
- Wholesale: At the point of final sale or export within the state, the wholesale margin was applied to the product value. Within the IOIG classification, export activity is included within the wholesale sector.
- Retail: At the point of final sale within the state, the retail margin was applied to the product value.

Economic contribution analysis

To estimate the associated economic contribution with the direct output of forestry products identified above, the economic modelling framework outlined in Section 2.2 was applied. This involved transforming the direct activity for each sector into an expenditure ‘shock’ that could be applied to the RISE model.

To incorporate the economic activity associated with the supply chain extension, a similar approach to the softwood structural timber supply chain case study was used. This step took total product revenue generated by primary processers as an input. These mill product revenues became resource input expenditures for post mill businesses (e.g. secondary processors, wholesalers, retailers). Products that were estimated to flow through the softwood structural timber post mill supply chain were removed, since they had already been accounted for.

The remaining volume of product was estimated to flow through the post mill supply chain in line with the sector-to-sector flows provided in the RISE models in Table 2-6 to Table 2-8. This meant that a product could undergo a significant number (and combination) of value-adding processes before reaching a final consumer.

Using resource input expenditures, post mill business revenues for each supply chain stage were estimated based on the allocations to IOIG sectors provided in Table 2-5. This was determined where, knowing timber input costs, other input costs and margins were scaled to match average industry profitability. Given that products are sold to consumers at a range of post mill supply chain stages, timber input volumes reduced with each value-adding process. However, each supply chain stage increased average product sales value. At each supply chain stage, I-O allocations were applied to direct input costs, with profits being retained.

Keeping each post mill supply chain stage separate for analysis purposes, the output from this step was an estimate of the contribution of each type of activity for each of the remaining supply chain stages.

Table 2-5 Supply chain stage IOIG sectors and application

Model application	IOIG sector
The margin of these sectors was attributed proportionally based on the cost of wood inputs relative to the cost of other input materials and services.	• 1402 Other Wood Product Manufacturing • 1501 Pulp, Paper and Paperboard Manufacturing • 1502 Paper Stationery and Other Converted Paper Product Manufacturing • 1601 Printing • 2501 Furniture Manufacturing • 5401 Publishing
ABS I-O tables provide insufficient margin information for secondary processed wood products specifically, as very few are specialised in these products. Therefore, the average margin for all manufactured products was used for these sectors.	• 3901 Retail Trade retail (23%) • 3301 Wholesale Trade (28%) • 4601 Road Transport (5%)

Source: BDO analysis

Table 2-6 Assumed Victorian softwood supply chain stage flows

Supply chain flows: Victorian softwood		Sales from…						
		Mill	Other Wood Product Manufacturing	Pulp, Paper and Paperboard Manufacturing	Paper Stationery and Other Converted Paper Product Manufacturing	Printing	Furniture Manufacturing	Publication
Sales to…	Other Wood Product Manufacturing	20%						
	Pulp, Paper and Paperboard Manufacturing	26%	0%					
	Paper Stationery and Other Converted Paper Product Manufacturing	0%	0%	2%				
	Printing	0%	0%	2%	0%			
	Furniture Manufacturing	6%	6%	0%	2%			
	Publication	0%	0%	1%	1%	2%		
	Final sale, or sale to another sector in Vic	45%	91%	13%	87%	60%	72%	97%
	Exports from Vic	2%	3%	82%	9%	38%	28%	3%

Source: BDO analysis

Table 2-7 Assumed Victorian hardwood supply chain stage flows

Supply chain flows: Victorian hardwood		Sales from…						
		Mill	Other Wood Product Manufacturing	Pulp, Paper and Paperboard Manufacturing	Paper Stationery and Other Converted Paper Product Manufacturing	Printing	Furniture Manufacturing	Publication
Sales to…	Other Wood Product Manufacturing	0%						
	Pulp, Paper and Paperboard Manufacturing	0%	0%					
	Paper Stationery and Other Converted Paper Product Manufacturing	0%	0%	0%				
	Printing	0%	0%	0%	0%			
	Furniture Manufacturing	0%	0%	0%	0%			
	Publication	0%	0%	0%	0%	0%		
	Final sale, or sale to another sector in Vic	0%	0%	0%	0%	0%	0%	0%
	Exports from Vic	100%	0%	0%	0%	0%	0%	0%

Source: BDO analysis

Table 2-8 Assumed Victorian native forest supply chain stage flows

Supply chain flows: Victorian native forest		Sales from…						
		Mill	Other Wood Product Manufacturing	Pulp, Paper and Paperboard Manufacturing	Paper Stationery and Other Converted Paper Product Manufacturing	Printing	Furniture Manufacturing	Publication
Sales to…	Other Wood Product Manufacturing	20%						
	Pulp, Paper and Paperboard Manufacturing	27%	0%					
	Paper Stationery and Other Converted Paper Product Manufacturing	0%	0%	2%				
	Printing	0%	0%	2%	0%			
	Furniture Manufacturing	6%	6%	0%	2%			
	Publication	0%	0%	1%	1%	2%		
	Final sale, or sale to another sector in Vic	47%	91%	13%	87%	60%	72%	97%
	Exports from Vic	0%	3%	82%	9%	38%	28%	3%

Source: BDO analysis

3. Victoria results 2021-22

Economic contribution analysis was completed for the forestry activity within Victoria. The flow on effects to the Victorian economy were also estimated.

3.1. Direct contribution

Value of output

In 2021-22, the direct output from the growing, silviculture, harvesting, haulage, and primary processing forestry activity in Victoria was $1,485.0 million. This excludes sales of products or services occurring between earlier points in the supply chain prior to primary processing, to avoid double counting. By supply chain stage, $39.0 million was contributed by silviculture, $327.9 million by harvest and haulage, $615.8 million by growers, $1,465.8 million by wood and paper processors, and the remaining by other businesses including consultants, equipment sales and training (Table 3-3).

Of this, $811.5 million was contributed by softwood plantation, $382.3 million by hardwood plantation, and $291.1 million by native forest production. The breakdowns by supply chain stage for softwood, hardwood, and native forest are detailed in Table 3-4, Table 3-5, and Table 3-6 respectively.

Industry expenditure

Value of output does not always provide a picture of the extent to which an industry contributes directly to the region it is located in. Examining expenditure helps to answer questions such as whether industry expenditure largely occurs locally or is mostly occurring some distance from the region in which the business is located. In 2021-22, the Victorian forest industry supported $1,005.3 million in direct net expenditure in Victoria, up to and including the point of primary processing. This included $491.6 million by softwood production, $252.8 million by hardwood production, and $260.8 million supported by native forest production (Table 3-1).

To understand where industry expenditure is supported, Table 3-2 shows both gross and net expenditure. While gross expenditure is not a true measure of economic contribution (due to double counting) it helps show the relative size of different parts of the supply chain. Net expenditure is a measure of economic contribution and shows how much expenditure outside of the forest industry is added at different points in the supply chain.

Contribution to GSP

Measures of the forest industry's contribution to GSP can be thought of as the value-added by the industry to the economy, or the value left once non-wage expenditure is subtracted from revenue. This means GSP represents the value contributed to the economy in the form of returns to business/resource owners (in the form of profits), workers (in the form of wages and salaries), and taxes to governments. Using GSP as a measure of economic contribution avoids the problem of double counting that may arise from using value of output for this purpose.

In total, in 2021-22, the forest industry contributed $548.6 million in direct GSP in Victoria. This included $13.0 million contributed by silviculture, $105.8 million by growers, $91.4 million by harvest and haulage, $327.9 million by wood and paper processors, and the remaining by other businesses including consultants, equipment sales and training (Table 3-3).

Of this, $359.2 million was contributed by softwood plantation, $128.2 million by hardwood plantation, and $61.2 million by native forest production (Table 3-4, Table 3-5, and Table 3-6).

Figure 3-1 shows the derivation of direct contribution to GSP by the forest industry in Victoria. The figure shows that GSP (blue) is what remains once non-wage net expenditure (red) is subtracted from value of output (green). The orange bars show that most of the direct contribution to GSP was gross operating surplus (GOS, before-tax business profit), followed by wages, and a small amount of other value added (OVA, in this case annuities and donations).

Household income and employment

Household income, a component of GSP, is a useful indicator of the welfare of households. In total, in 2021-22, the forest industry contributed $388.4 million to direct household income in Victoria. This included $14.0 million contributed by silviculture, $56.8 million by growers, $120.7 million by harvest and haulage, $186.3 million by wood and paper processors, and the remaining by other businesses including consultants, equipment sales and training (Table 3-3).

Of this, $203.1 million was contributed by softwood plantation, $79.0 million by hardwood plantation, and $106.4 million by native forest production (Table 3-4, Table 3-5, and Table 3-6).

In total, in 2021-22, the forest industry contributed 3,678 direct fte jobs in Victoria. This included 141 fte jobs supported by silviculture, 499 fte jobs by growers, 890 fte jobs by harvest and haulage, 1,996 fte jobs by wood and paper processors, and the remaining by other businesses including consultants, equipment sales and training.

Of this, 1,928 fte jobs were supported by softwood, 713 fte jobs by hardwood, and 1,038 fte jobs by native forest production (Table 3-4, Table 3-5, and Table 3-6).

Table 3-1 Direct operational and capital expenditure ($m) by Victorian forest industries, by industry sector, 2021-22

Type of expenditure	Softwood plantation		Hardwood plantation		Native forest		Total Victoria	
	Value ($m)	% of total	Value ($m)	% of total	Value ($m)	% of total	Value ($m)	% of total
Wages/Salaries	203.1	30.7%	79.0	23.1%	106.4	31.3%	388.4	28.9%
Manufacturing	69.1	10.4%	45.4	13.3%	38.3	11.3%	152.8	11.4%
Transport, Postal and Warehousing	75.9	11.5%	52.2	15.3%	40.8	12.0%	168.9	12.6%
Retail and Wholesale Trade	68.7	10.4%	35.3	10.4%	35.1	10.3%	139.1	10.4%
Electricity, Gas, Water and Waste Services	24.6	3.7%	9.7	2.8%	11.7	3.5%	46.0	3.4%
Other Services	21.7	3.3%	14.1	4.1%	10.9	3.2%	46.7	3.5%
Annuities and donations	6.1	0.9%	8.4	2.5%	3.9	1.1%	18.3	1.4%
Communication	11.8	1.8%	3.2	0.9%	4.7	1.4%	19.7	1.5%
Construction	0.8	0.1%	0.4	0.1%	0.7	0.2%	2.0	0.1%
Agriculture	0.4	0.1%	0.6	0.2%	2.4	0.7%	3.4	0.3%
Professional, Scientific and Technical Services	0.6	0.1%	0.5	0.2%	1.7	0.5%	2.8	0.2%
Other	9.5	1.4%	4.3	1.2%	4.4	1.3%	18.1	1.3%
Sub-total	**492.1**	**74.3%**	**253.1**	**74.1%**	**261.1**	**76.7%**	**1006.3**	**74.9%**
Expenditure outside the respective region	169.8	25.7%	88.6	25.9%	79.4	23.3%	337.9	25.1%
Total	**661.9**	**100.0%**	**341.7**	**100.0%**	**340.5**	**100.0%**	**1344.1**	**100.0%**

Source: BDO analysis

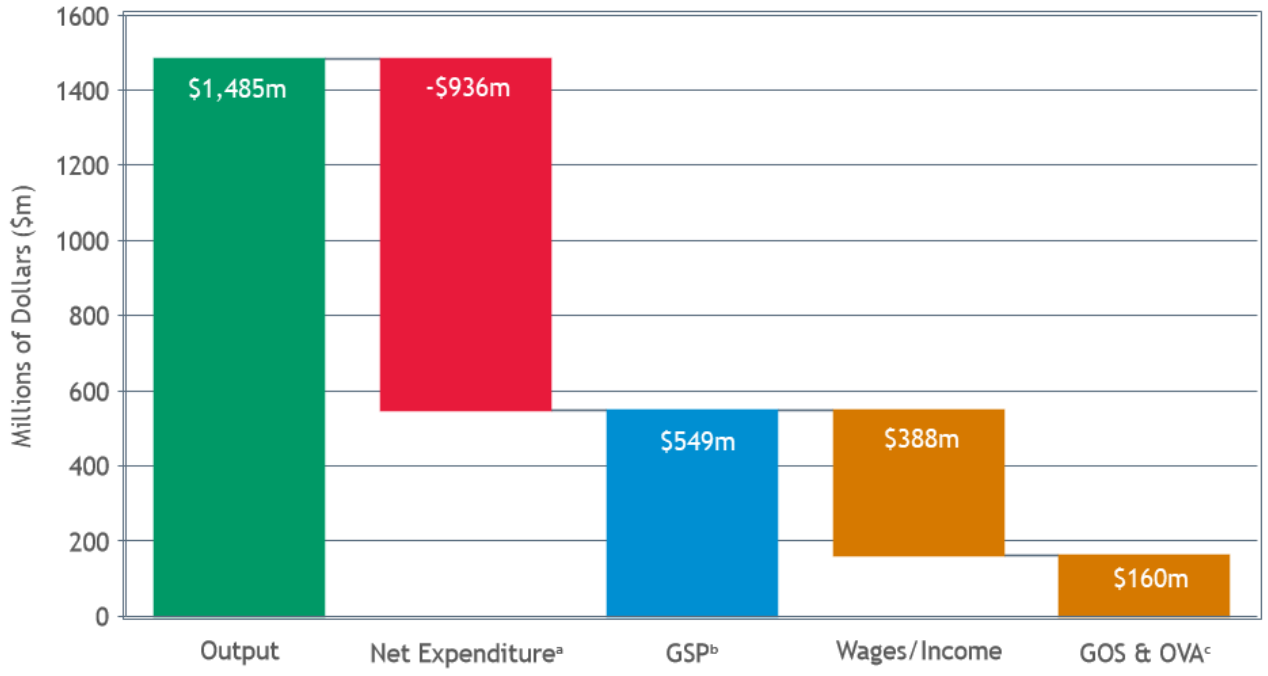
Table 3-2 Direct expenditure ($m), by industry sector, 2021-22

Supply chain stage	Softwood plantation		Hardwood plantation		Native forest		Total Victoria	
	Gross expend-iture in 2021-22 ($m)	Net expend-iture ($m)[a]	Gross expend-iture in 2021-22 ($m)	Net expend-iture ($m)	Gross expend-iture in 2021-22 ($m)	Net expend-iture ($m)	Gross expend-iture in 2021-22 ($m)	Net expend-iture ($m)[a]
Establishing and growing plantations	303.8	94.1	183.5	87.7	151.0	61.8	638.3	243.6
Harvest and haulage of logs to processors	184.5	184.5	83.9	83.9	89.7	89.7	358.2	358.2
Primary wood and paper processing	633.2	383.3	416.7	170.1	288.9	188.9	1,338.8	742.3
Total	**1,121.5**	**661.9**	**684.1**	**341.7**	**529.6**	**340.5**	**2,335.3**	**1,344.1**

[a] This table shows expenditure net of transfers within the industry. The net figure ensures there is no double counting by ensuring that payments made from one part of the industry to another (and then expended in that other part of the industry) are not included. The transfers excluded from net figures include payments made to harvest, haulage, roading, earthworks and silvicultural contractors by native forest and plantation managers, and payments made to native forest and plantation managers or to other processors for fibre inputs used by processors.

Source: BDO analysis

Figure 3-1 Calculation and decomposition of direct contribution to GSP, Victoria, total industry, 2021-22



[a] Net expenditure is defined in Table 3-2 except that wages are excluded because they are a component of GSP.

[b] Gross State Product (GSP)

[c] Gross Operating Surplus (GOS is before-tax business profit and Other Value-Added (OVA) is other kinds of income not already counted. In this case it is annuities paid by the growers and donations made by businesses anywhere along the forestry industry supply chain up to and including primary processing.

Source: BDO analysis

3.2. Total contribution

The direct expenditure of any industry generates further flow-on effects. Expenditure by one industry generates economic activity in other parts of the economy, and therefore generates further jobs and economic activity beyond that occurring directly within the first industry. This flow-on activity can be production-induced, meaning it is supported as a result of the purchase of goods and services by the industry (e.g. purchasing fuel, mechanical services, accounting or financial services, to name a few), or consumption-induced, meaning it is supported as a result of workers in the industry and service industries spending their wages/salaries. 'Total' economic value refers to the total value an industry contributes to the economy when both direct and flow-on effects are included.

Value of output

In Victoria, the total value of output contributed by the forestry industry in 2021-22 was $3,769.5 million for the industry up to and including primary processing (excluding transfers). This includes $100.3 million by silviculture, $911.1 million by growers, $852.6 million by harvest and haulage, $2,824.4 million by wood and paper processors, and the remaining by other businesses including consultants, equipment sales and training (Table 3-3).

The softwood plantation industry total output in Victoria of $1,922.5 million was higher than both total output in the hardwood plantation industry of $967.5 million and native forest industry of $879.5 million (Table 3-4 , Table 3-5, and Table 3-6).

Contribution to GSP

In Victoria, the total contribution to the value of GSP in 2021-22 was $1,687.1 million for the forestry industry up to and including primary processing. This includes $44.1 million by silviculture, $257.5 million by growers, $357.8 million by harvest and haulage, $944.5 million by wood and paper processors, and the remaining by other businesses including consultants, equipment sales and training (Table 3-3).

The total GSP contributed by the softwood plantation industry in Victoria of $914.7 million was higher than both the total GSP contributed by the hardwood industry of $417.4 million and the native forest industry $355.1 million (Table 3-4, Table 3-5, and Table 3-6).

Household income and employment

In Victoria, the total contribution to household income in 2021-22 was $1,070.2 million for the forestry industry. This includes $32.4 million by silviculture, $146.9 million by growers, $277.5 million by harvest and haulage, $589.3 million by wood and paper processors, and the remaining by other businesses including consultants, equipment sales and training (Table 3-3).

The total household income contributed by the softwood plantation industry in Victoria of $533.3 million was higher than both the total household income contributed by the hardwood plantation and native forest industry of $255.5 million and $281.5 million respectively (Table 3-4 ,Table 3-5, and Table 3-6).

In Victoria, the forestry industry supported a total of 11,512 fte jobs, including 356 fte jobs by silviculture, 1,540 fte jobs by growers, 2,726 fte jobs by harvest and haulage, 6,576 fte jobs by wood and paper processors, and the remaining by other businesses including consultants, equipment sales and training (Table 3-4, Table 3-5, and Table 3-6).

The total employment supported by the softwood plantation industry in Victoria of 5,703 fte jobs was higher than both the total employment supported by the hardwood plantation and native forest industry of 2,762 fte jobs and 3,047 fte jobs respectively (Table 3-4, Table 3-5, and Table 3-6).

The total multiplier estimates that for every direct job supported by the forest industry in Victoria a total of 3.1 jobs were supported in the region through a combination of production-induced and consumption-induced effects (Table 3-7).

Table 3-3 Economic contribution of the operation of the forest industry in Victoria, by supply chain stage, 2021-22

	Forest management and growing	Wood and paper processing	Harvest and haulage	Silviculture	Other[a]	Whole Industry (excludes transfers)
Output[b] ($m)	**911.1**	**2,824.4**	**852.6**	**100.3**	**72.3**	**3,769.5**
Direct ($m)	615.8	1,465.8	327.9	39.0	27.6	1,485.0
Production-induced ($m)	122.1	663.7	197.5	23.1	16.2	1,022.6
Consumption-induced ($m)	173.2	694.9	327.2	38.2	28.5	1,261.9
GSP ($m)	**257.5**	**994.5**	**357.8**	**44.1**	**33.2**	**1,687.1**
Direct ($m)	105.8	327.9	91.4	13.0	10.5	548.6
Production-induced ($m)	57.9	290.3	89.2	10.4	7.3	455.0
Consumption-induced ($m)	93.8	376.4	177.2	20.7	15.4	683.5
Household Income ($m)	**146.9**	**589.3**	**277.5**	**32.4**	**24.1**	**1,070.2**
Direct ($m)	56.8	186.3	120.7	14.0	10.6	388.4
Production-induced ($m)	40.8	205.0	63.6	7.5	5.4	322.2
Consumption-induced ($m)	49.4	198.0	93.2	10.9	8.1	359.6
Employment (fte)	**1,540**	**6,576**	**2,726**	**356**	**314**	**11,512**
Direct (fte)	499	1,996	890	141	152	3,678
Production-induced (fte)	479	2,324	773	91	70	3,736
Consumption-induced (fte)	563	2,257	1,063	124	92	4,098
Employment (total)	**1,586**	**6,814**	**2,847**	**525**	**358**	**12,130**
Direct (total)	497	2,042	915	299	188	3,941
Production-induced (total)	467	2,276	756	89	68	3,655
Consumption-induced (total)	622	2,497	1,176	137	102	4,534

[a] Other includes consultants, equipment sales and training.

[b] Industry output may be lower than the sum of output for individual stages as it excludes transfers between stages to prevent double counting.

Source: BDO analysis

Table 3-4 Economic contribution of the operation of the softwood plantation industry in Victoria, by supply chain stage, 2021-22

	Forest management and growing	Wood and paper processing	Harvest and haulage	Silviculture	Other[a]	Whole Industry (excludes transfers)
Output[b] ($m)	**408.3**	**1,433.1**	**428.8**	**65.7**	**46.2**	**1,922.5**
Direct ($m)	324.9	737.4	165.6	25.6	17.7	811.5
Production-induced ($m)	31.0	326.5	99.2	15.1	10.4	482.2
Consumption-induced ($m)	52.5	369.2	164.0	25.1	18.1	628.8
GSP ($m)	**128.2**	**560.5**	**175.6**	**29.1**	**21.2**	**914.7**
Direct ($m)	84.6	217.1	41.9	8.8	6.8	359.2
Production-induced ($m)	15.2	143.4	44.8	6.8	4.7	214.9
Consumption-induced ($m)	28.4	200.0	88.8	13.6	9.8	340.6
Household Income ($m)	**44.5**	**313.1**	**139.1**	**21.3**	**15.3**	**533.3**
Direct ($m)	19.3	107.5	60.4	9.3	6.7	203.1
Production-induced ($m)	10.3	100.5	32.0	4.9	3.5	151.0
Consumption-induced ($m)	15.0	105.2	46.7	7.1	5.1	179.2
Employment (fte)	**470**	**3,435**	**1,368**	**230**	**201**	**5,703**
Direct (fte)	192	1,102	447	89	97	1,928
Production-induced (fte)	108	1,133	388	59	45	1,734
Consumption-induced (fte)	170	1,199	532	81	59	2,042
Employment (total)	**487**	**3,559**	**1,421**	**346**	**228**	**6,039**
Direct (total)	191	1,120	452	199	119	2,081
Production-induced (total)	107	1,112	380	58	44	1,700
Consumption-induced (total)	189	1,327	589	90	65	2,259

[a] Other includes consultants, equipment sales and training.

[b] Industry output may be lower than the sum of output for individual stages as it excludes transfers between stages to prevent double counting.

Source: BDO analysis

Table 3-5 Economic contribution of the operation of the hardwood plantation industry in Victoria, by supply chain stage, 2021-22

	Forest management and growing	Wood and paper processing	Harvest and haulage	Silviculture	Other[a]	Whole Industry (excludes transfers)
Output[b] ($m)	**304.7**	**754.0**	**205.2**	**26.7**	**19.3**	**967.5**
Direct ($m)	194.3	434.0	78.7	10.4	7.4	382.3
Production-induced ($m)	51.9	174.0	47.5	6.3	4.3	283.9
Consumption-induced ($m)	58.5	145.9	79.0	10.1	7.7	301.2
GSP ($m)	**103.2**	**205.4**	**88.4**	**11.6**	**8.9**	**417.4**
Direct ($m)	47.4	50.6	24.1	3.3	2.8	128.2
Production-induced ($m)	24.0	75.8	21.4	2.8	1.9	126.0
Consumption-induced ($m)	31.7	79.0	42.8	5.5	4.2	163.1
Household Income ($m)	**49.7**	**123.8**	**67.0**	**8.6**	**6.5**	**255.5**
Direct ($m)	15.6	27.6	29.2	3.7	2.9	79.0
Production-induced ($m)	17.3	54.6	15.3	2.0	1.4	90.7
Consumption-induced ($m)	16.7	41.6	22.5	2.9	2.2	85.8
Employment (fte)	**533**	**1,418**	**630**	**97**	**84**	**2,762**
Direct (fte)	130	315	187	40	41	713
Production-induced (fte)	213	629	186	25	18	1,071
Consumption-induced (fte)	190	474	256	33	25	978
Employment (total)	**545**	**1,459**	**659**	**137**	**96**	**2,897**
Direct (total)	129	320	194	77	51	771
Production-induced (total)	206	614	182	24	18	1,044
Consumption-induced (total)	210	524	284	36	28	1,082

[a] Other includes consultants, equipment sales and training.

[b] Industry output may be lower than the sum of output for individual stages as it excludes transfers between stages to prevent double counting.

Source: BDO analysis

Table 3-6 Economic contribution of the operation of the native forest industry in Victoria, by supply chain stage, 2021-22

	Forest management and growing	Wood and paper processing	Harvest and haulage	Silviculture	Other[a]	Whole Industry (excludes transfers)
Output[b] ($m)	**198.1**	**637.3**	**218.7**	**7.8**	**6.8**	**879.5**
Direct ($m)	96.7	294.4	83.6	3.0	2.6	291.1
Production-induced ($m)	39.2	163.2	50.7	1.8	1.5	256.5
Consumption-induced ($m)	62.2	179.7	84.3	3.0	2.7	331.9
GSP ($m)	**26.1**	**228.6**	**93.9**	**3.4**	**3.1**	**355.1**
Direct ($m)	-26.2	60.2	25.3	0.9	0.9	61.2
Production-induced ($m)	18.6	71.1	22.9	0.8	0.7	114.1
Consumption-induced ($m)	33.7	97.3	45.7	1.6	1.5	179.8
Household Income ($m)	**52.8**	**152.4**	**71.5**	**2.5**	**2.3**	**281.5**
Direct ($m)	21.9	51.3	31.1	1.1	1.0	106.4
Production-induced ($m)	13.2	49.9	16.3	0.6	0.5	80.5
Consumption-induced ($m)	17.7	51.2	24.0	0.9	0.8	94.6
Employment (fte)	**537**	**1,723**	**729**	**29**	**29**	**3,047**
Direct (fte)	177	579	256	12	14	1,038
Production-induced (fte)	158	561	199	7	6	931
Consumption-induced (fte)	202	584	274	10	9	1,078
Employment (total)	**555**	**1,797**	**767**	**41**	**34**	**3,193**
Direct (total)	177	601	270	23	18	1,089
Production-induced (total)	154	550	194	7	6	911
Consumption-induced (total)	223	646	303	11	10	1,193

[a] Other includes consultants, equipment sales and training.

[b] Industry output may be lower than the sum of output for individual stages as it excludes transfers between stages to prevent double counting.

Source: BDO analysis

Table 3-7 Employment multipliers for indirect employment supported by the Victorian forest industry, 2021-22

Type of multiplier	Description	Native forest		Softwood plantation		Hardwood plantation		Victoria	
		Multip-lier	Total jobs	Multip-lier	Total jobs	Multip-lier	Total jobs	Multip-lier	Total jobs
None	Direct jobs only	1.0	1,089	1.0	2,081	1.0	771	1.0	3,941
Type I	Direct jobs + production induced jobs	1.8	2,001	1.8	3,780	2.4	1,815	1.9	7,596
Type II	Direct jobs + production induced jobs + consumption induced jobs	2.9	3,193	2.9	6,039	3.8	2,897	3.1	12,130
Total jobs per million dollars of direct industry output		11.0	3,193	7.4	6,039	7.6	2,897	8.2	12,130

Source: BDO analysis

4. Regional Victoria results 2021-22

To demonstrate the regional significance of the industry and the importance to local communities, economic contribution analysis was completed for the forestry activity within regional Victoria. The Regional Partnership regions as defined by Regional Development Victoria were used for this analysis (see Figure 1-2). The four regions that contributed the most forestry activity to Victoria in 2021-22 were Gippsland, Barwon, Great South Coast, and Ovens Murray. The direct and flow on effects in these regions were estimated and are summarised in Section 4.1 by supply chain stage. Additionally, the major contributing regions for the native forest sector are presented in Section 4.2. There is also substantial forestry activity occurring in other Victorian Regional Partnerships that is not reported by region due to confidentiality constraints.

4.1. Total contribution

4.1.1. Gippsland

Value of output

In the Gippsland region, the forest industry up to and including primary processing directly generated approximately $565.9 million in direct output in 2021-22 (excluding transfers). This directly included $24.8 million by silviculture, $194.3 million by growers, $130.1 million by harvest and haulage, $507.4 million by processors, and the remaining by other businesses. The total value of output contributed by the industry in 2021-22 (excluding transfers) was $972.8 million once flow-on effects in the broader economy were included (Table 4-1).

Contribution to GRP

In the Gippsland region in 2021-22, the forest industry up to and including primary processing directly contributed approximately $140.6 million in GRP, and a total of $338.6 million once flow-on effects in the broader economy were included. This total included $17.1 million by silviculture, $29.0 million by growers, $86.3 million by harvest and haulage, $204.4 million by processors, and the remaining by other businesses (Table 4-1).

Household income and employment

In the Gippsland region, the forestry industry contribution to household income, a component of GRP, was $157.9 million directly and a total of $264.4 million once flow-on effects in the broader economy were included. This total included $13.9 million by silviculture, $38.4 million by growers, $75.6 million by harvest and haulage, $135.4 million by processors, and the remaining by other businesses (Table 4-1).

The forestry industry within the Gippsland region contributed 1,436 direct fte jobs to employment, and a total of 2,747 fte jobs once flow-on effects in the broader economy were included. This total included 155 fte jobs by silviculture, 376 fte jobs by growers, 686 fte jobs by harvest and haulage, 1,513 fte jobs by processors, and the remaining by other businesses.

4.1.2. Barwon

Value of output

In the Barwon region, the forest industry up to and including primary processing directly generated approximately $300.3 million in direct output in 2021-22 (excluding transfers). This directly included $6.1 million by silviculture, $33.6 million by growers, $14.8 million by harvest and haulage, $510.5 million by processors, and the remaining by other businesses. The total value of output contributed by the industry in

2021-22 (excluding transfers) was $477.3 million once flow-on effects in the broader economy were included (Table 4-2).

Contribution to GRP

In the Barwon region in 2021-22, the forest industry up to and including primary processing directly contributed approximately $158.3 million in GRP, and a total of $243.3 million once flow-on effects in the broader economy were included. This total included $4.5 million by silviculture, $10.5 million by growers, $10.6 million by harvest and haulage, $215.7 million by processors, and the remaining by other businesses (Table 4-2).

Household income and employment

In the Barwon region, the forestry industry contribution to household income, a component of GRP, was $64.5 million directly and a total of $114.8 million once flow-on effects in the broader economy were included. This total included $3.7 million by silviculture, $4.5 million by growers, $9.3 million by harvest and haulage, $95.6 million by processors, and the remaining by other businesses (Table 4-2).

The forestry industry within the Barwon region contributed 657 direct fte jobs to employment, and a total of 1,268 fte jobs once flow-on effects in the broader economy were included. This total included 42 fte jobs by silviculture, 49 fte jobs by growers, 88 fte jobs by harvest and haulage, 1,067 fte jobs by processors, and the remaining by other businesses.

4.1.3. Great South Coast

Value of output

In the Great South Coast region, the forest industry up to and including primary processing directly generated approximately $279.6 million in direct output in 2021-22 (excluding transfers). This directly included $9.1 million by silviculture, $181.3 million by growers, $63.3 million by harvest and haulage, $220.5 million by processors, and the remaining by other businesses. The total value of output contributed by the industry in 2021-22 (excluding transfers) was $407.4 million once flow-on effects in the broader economy were included (Table 4-3).

Contribution to GRP

In the Great South Coast region in 2021-22, the forest industry up to and including primary processing directly contributed approximately $121.8 million in GRP, and a total of $184.1 million once flow-on effects in the broader economy were included. This total included $6.1 million by silviculture, $77.3 million by growers, $40.7 million by harvest and haulage, $54.0 million by processors, and the remaining by other businesses (Table 4-3).

Household income and employment

In the Great South Coast region, the forestry industry contribution to household income, a component of GRP, was $55.3 million directly and a total of $92.0 million once flow-on effects in the broader economy were included. This total included $5.2 million by silviculture, $19.1 million by growers, $37.1 million by harvest and haulage, $26.0 million by processors, and the remaining by other businesses (Table 4-3).

The forestry industry within the Great South Coast region contributed 504 direct fte jobs to employment, and a total of 987 fte jobs once flow-on effects in the broader economy were included. This total included

59 fte jobs by silviculture, 208 fte jobs by growers, 350 fte jobs by harvest and haulage, 305 fte jobs by processors, and the remaining by other businesses.

4.1.4. Ovens Murray

Value of output

In the Ovens Murray region, the forest industry up to and including primary processing directly generated approximately $332.3 million in direct output in 2021-22 (excluding transfers). This directly included $1.9 million by silviculture, $111.7 million by growers, $111.7 million by harvest and haulage, $145.6 million by processors, and the remaining by other businesses. The total value of output contributed by the industry in 2021-22 (excluding transfers) was $466.2 million once flow-on effects in the broader economy were included (Table 4-4).

Contribution to GRP

In the Ovens Murray region in 2021-22, the forest industry up to and including primary processing directly contributed approximately $69.8 million in GRP, and a total of $135.7 million once flow-on effects in the broader economy were included. This total included $1.3 million by silviculture, $18.9 million by growers, $47.9 million by harvest and haulage, $67.5 million by processors, and the remaining by other businesses (Table 4-4).

Household income and employment

In the Ovens Murray region, the forestry industry contribution to household income, a component of GRP, was $66.9 million directly and a total of $103.9 million once flow-on effects in the broader economy were included. This total included $1.1 million by silviculture, $15.8 million by growers, $42.3 million by harvest and haulage, $44.6 million by processors, and the remaining by other businesses (Table 4-4).

The forestry industry within the Ovens Murray region contributed 590 direct fte jobs to employment, and a total of 1,059 fte jobs once flow-on effects in the broader economy were included. This total included 12 fte jobs by silviculture, 157 fte jobs by growers, 384 fte jobs by harvest and haulage, 506 fte jobs by processors, and the remaining by other businesses.

Table 4-1 Economic contribution of the operation of the forest industry in the Gippsland region, by supply chain stage, 2021-22

	Forest management and growing	Wood and paper processing	Harvest and haulage	Silviculture	Other[a]	Whole Industry (excludes transfers)
Output[b] ($m)	**241.2**	**749.3**	**228.2**	**42.9**	**4.0**	**972.8**
Direct ($m)	194.3	507.4	130.1	24.8	2.3	565.9
Production-induced ($m)	17.5	138.0	40.1	7.5	0.7	203.9
Consumption-induced ($m)	29.5	103.8	58.0	10.7	1.0	203.0
GRP ($m)	**29.0**	**204.4**	**86.3**	**17.1**	**1.8**	**338.6**
Direct ($m)	4.1	90.3	37.2	8.0	0.9	140.6
Production-induced ($m)	8.5	56.4	17.0	3.2	0.3	85.4
Consumption-induced ($m)	16.3	57.6	32.2	5.9	0.6	112.6
Household Income ($m)	**38.4**	**135.4**	**75.6**	**13.9**	**1.4**	**264.6**
Direct ($m)	25.0	74.9	48.3	8.8	0.9	157.9
Production-induced ($m)	5.5	32.7	11.8	2.2	0.2	52.5
Consumption-induced ($m)	7.9	27.7	15.5	2.8	0.3	54.2
Employment (fte)	**376**	**1,513**	**686**	**155**	**18**	**2,747**
Direct (fte)	211	789	335	89	12	1,436
Production-induced (fte)	56	341	138	26	3	563
Consumption-induced (fte)	109	383	214	39	4	748
Employment (total)	**387**	**1,574**	**719**	**255**	**21**	**2,956**
Direct (total)	211	803	343	186	14	1,557
Production-induced (total)	60	363	148	28	3	601
Consumption-induced (total)	116	408	228	42	4	798

[a] Other includes consultants, equipment sales and training.

[b] Industry output may be lower than the sum of output for individual stages as it excludes transfers between stages to prevent double counting.

Source: BDO analysis

Table 4-2 Economic contribution of the operation of the forest industry in the Barwon region, by supply chain stage, 2021-22

	Forest management and growing	Wood and paper processing	Harvest and haulage	Silviculture	Other[a]	Whole Industry (excludes transfers)
Output[b] ($m)	**40.8**	**659.9**	**27.8**	**11.3**	**4.9**	**477.3**
Direct ($m)	33.6	510.5	14.8	6.1	2.6	300.3
Production-induced ($m)	3.1	63.7	4.6	1.9	0.8	74.1
Consumption-induced ($m)	4.0	85.7	8.4	3.3	1.5	102.9
GRP ($m)	**10.5**	**215.7**	**10.6**	**4.5**	**2.1**	**243.4**
Direct ($m)	7.0	144.2	4.2	2.0	1.0	158.3
Production-induced ($m)	1.4	25.7	1.9	0.8	0.3	30.1
Consumption-induced ($m)	2.2	45.8	4.5	1.8	0.8	55.0
Household Income ($m)	**4.5**	**95.6**	**9.3**	**3.7**	**1.7**	**114.8**
Direct ($m)	2.3	53.5	5.5	2.2	1.0	64.5
Production-induced ($m)	1.0	17.7	1.4	0.6	0.3	21.0
Consumption-induced ($m)	1.1	24.4	2.4	0.9	0.4	29.3
Employment (fte)	**49**	**1,067**	**88**	**42**	**22**	**1,268**
Direct (fte)	23	561	38	22	13	657
Production-induced (fte)	11	182	18	7	3	222
Consumption-induced (fte)	15	323	32	13	6	388
Employment (total)	**51**	**1,099**	**92**	**67**	**26**	**1,335**
Direct (total)	23	564	39	46	16	687
Production-induced (total)	12	193	19	8	4	236
Consumption-induced (total)	16	343	33	13	6	412

[a] Other includes consultants, equipment sales and training.

[b] Industry output may be lower than the sum of output for individual stages as it excludes transfers between stages to prevent double counting.

Source: BDO analysis

Table 4-3 Economic contribution of the operation of the forest industry in the Great South Coast region, by supply chain stage, 2021-22

	Forest management and growing	Wood and paper processing	Harvest and haulage	Silviculture	Other[a]	Whole Industry (excludes transfers)
Output[b] ($m)	**207.6**	**263.2**	**109.7**	**15.6**	**13.8**	**407.4**
Direct ($m)	181.3	220.5	63.3	9.1	7.8	279.6
Production-induced ($m)	12.1	23.5	18.8	2.7	2.4	59.4
Consumption-induced ($m)	14.2	19.3	27.6	3.8	3.5	68.4
GRP ($m)	**77.3**	**54.0**	**40.7**	**6.1**	**5.9**	**184.1**
Direct ($m)	63.9	33.8	18.1	3.0	3.0	121.8
Production-induced ($m)	5.5	9.4	7.3	1.0	0.9	24.2
Consumption-induced ($m)	7.9	10.7	15.3	2.1	2.0	38.0
Household Income ($m)	**19.1**	**26.0**	**37.1**	**5.2**	**4.8**	**92.0**
Direct ($m)	11.2	14.3	23.5	3.2	3.0	55.3
Production-induced ($m)	3.9	6.2	5.9	0.8	0.7	17.6
Consumption-induced ($m)	4.0	5.4	7.7	1.1	1.0	19.1
Employment (fte)	**208**	**305**	**350**	**59**	**66**	**987**
Direct (fte)	109	158	163	33	41	504
Production-induced (fte)	44	71	80	11	11	217
Consumption-induced (fte)	55	75	107	15	14	266
Employment (total)	**211**	**314**	**363**	**96**	**75**	**1,058**
Direct (total)	107	161	167	68	49	552
Production-induced (total)	46	74	83	12	11	226
Consumption-induced (total)	58	79	113	16	14	280

[a] Other includes consultants, equipment sales and training.

[b] Industry output may be lower than the sum of output for individual stages as it excludes transfers between stages to prevent double counting.

Source: BDO analysis

Table 4-4 Economic contribution of the operation of the forest industry in the Ovens Murray region, by supply chain stage, 2021-22

	Forest management and growing	Wood and paper processing	Harvest and haulage	Silviculture	Other[a]	Whole Industry (excludes transfers)
Output[b] ($m)	**131.1**	**203.7**	**127.8**	**3.4**	**0.2**	**466.2**
Direct ($m)	111.7	145.6	72.9	1.9	0.1	332.3
Production-induced ($m)	7.2	23.7	22.3	0.6	0.0	53.8
Consumption-induced ($m)	12.2	34.4	32.6	0.8	0.1	80.1
GRP ($m)	**18.9**	**67.5**	**47.9**	**1.3**	**0.1**	**135.7**
Direct ($m)	8.8	39.5	20.8	0.6	0.0	69.8
Production-induced ($m)	3.6	9.4	9.4	0.2	0.0	22.7
Consumption-induced ($m)	6.6	18.6	17.6	0.5	0.0	43.3
Household Income ($m)	**15.8**	**44.6**	**42.3**	**1.1**	**0.1**	**103.9**
Direct ($m)	10.0	29.0	27.1	0.7	0.0	66.9
Production-induced ($m)	2.4	5.8	6.0	0.2	0.0	14.3
Consumption-induced ($m)	3.5	9.7	9.2	0.2	0.0	22.7
Employment (fte)	**157**	**506**	**384**	**12**	**1**	**1,059**
Direct (fte)	85	309	188	7	1	590
Production-induced (fte)	23	61	68	2	0	154
Consumption-induced (fte)	48	135	128	3	0	315
Employment (total)	**160**	**530**	**401**	**20**	**1**	**1,112**
Direct (total)	85	325	192	15	1	618
Production-induced (total)	25	64	74	2	0	165
Consumption-induced (total)	50	141	134	3	0	329

[a] Other includes consultants, equipment sales and training.

[b] Industry output may be lower than the sum of output for individual stages as it excludes transfers between stages to prevent double counting.

Source: BDO analysis

4.2. Native forest contribution

For the native forest sector in Victoria, direct contribution to GSP was $61.2 million in 2021-22, while direct contribution to household income was $106.4 million. As shown in Figure 3-1, GSP is calculated as the sum of household income, gross operating surplus and other value added (other kinds of income not already counted). As direct GSP was less than direct household income for the native forest sector, this implies that on average, businesses in the industry were unprofitable in 2021-22.

Economic contribution analysis was also completed for the native forestry activity within regional Victoria. The two regions that contributed the most forestry activity to Victoria were the Gippsland and Ovens Murray Regional Partnership regions. The estimated direct and flow on effects of the native forest industry to these regional economies are summarised in this section. Investigating the native forest industry sector at a regional level increases uncertainty in the results. Considering the closure of the native forest industry and the discussion above, the regional analysis was conducted to offer insights into local activity. However, it is important to interpret the results with care.

Value of output

In 2021-22, the native forest industry up to and including primary processing directly generated approximately $302.6 million in direct output in the Gippsland region and $46.3 million in direct output in the Ovens Murray region (excluding transfers). The total value of output contributed by the industry in 2021-22 (excluding transfers) was $453.4 million in the Gippsland region and $68.7 million in the Ovens Murray region once flow-on effects in the broader economy were included (Table 4-5).

Contribution to GRP

In 2021-22, the native forest industry up to and including primary processing directly contributed approximately $28.6 million to GRP in the Gippsland region, and a total of $102.3 million once flow-on effects in the broader economy were included. In the Ovens Murray region, the native forest industry up to and including primary processing directly contributed approximately $1.0 million in GRP, and a total of $12.4 million once flow-on effects in the broader economy were included (Table 4-5).

Household income and employment

In the Gippsland region in 2021-22, the native forest industry contribution to household income, a component of GRP, was $61.1 million directly and a total of $100.4 million once flow-on effects in the broader economy were included. In the Ovens Murray region, the native forest contribution to household income was $13.0 million directly and a total of $19.3 million once flow-on effects in the broader economy were included (Table 4-5).

The native forest industry within the Gippsland region contributed 581 direct fte jobs to employment, and a total of 1,063 fte jobs once flow-on effects in the broader economy were included. In the Ovens Murray region, the native forest industry contributed 114 direct fte jobs to employment, and a total of 195 fte jobs once flow-on effects in the broader economy were included (Table 4-5).

Table 4-5 Economic contribution of the operation of the native forest industry by region, by supply chain stage, 2021-22

	Gippsland	Ovens Murray
Output ($m)	**453.4**	**68.7**
Direct ($m)	302.6	46.3
Production-induced ($m)	73.9	7.6
Consumption-induced ($m)	77.0	14.8
GRP ($m)	**102.3**	**12.4**
Direct ($m)	28.6	1.0
Production-induced ($m)	31.0	3.3
Consumption-induced ($m)	42.7	8.0
Household Income ($m)	**100.4**	**19.3**
Direct ($m)	61.1	13.0
Production-induced ($m)	18.7	2.1
Consumption-induced ($m)	20.5	4.2
Employment (fte)	**1,063**	**195**
Direct (fte)	581	114
Production-induced (fte)	198	23
Consumption-induced (fte)	284	59
Employment (total)	**1,112**	**203**
Direct (total)	599	117
Production-induced (total)	211	25
Consumption-induced (total)	303	61

Source: BDO analysis

5. 2022/23 supply-chain analysis (study extension)

Following the completion of the 2021-22 economic contribution analysis, this study was extended to include economic contribution indicators for 2022-23. The scope of these estimates was broadened to include supply chain activity through to the final user. This extension involved two additional methodological components:

1. Update the 2021-22 economic contribution model that was constructed with primary data for 2022-23 using aggregate production data.
2. Model the downstream supply-chain economic contribution using published statistics.

The method applied is described in Section 2.4, including details about the scope of the estimates and the assumptions applied.

When interpreting the results, it is important to consider that the 2021-22 estimates are based on primary data collection for that specific year, involving over 90 businesses. The data collection and analysis method focused on accurately estimating the amount of local economic activity generated by locally grown products.

In contrast, the 2022-23 analysis aimed to provide up-to-date information for a more recent year and to explore how publicly available data could be used to understand activity along the supply chain. These estimates are valuable for understanding the volume of activity within local supply chains for local products and how economic contributions changed between years, though with a lower degree of accuracy.

Given this, the 2021-22 and 2022-23 results are useful in different ways and should be interpreted with their specific contexts and objectives in mind.

5.1. Victoria results

Direct output

In Victoria, the direct value of output contributed by the industry in 2022-23 was $5,235.5 million. This includes $1,347.9 million up to the point of sale of primary processed products, and $3,887.5 million from downstream supply chain activity (Table 5-1). The direct value of output from the softwood forestry industry in Victoria was $3,596.0 million, which was higher than the $1,279.7 million contributed by the hardwood industry and the $359.8 million contributed by the native forest industry (Table 5-2 to Table 5-4).

Direct output up to primary processing increased for both softwood and hardwood between 2021-22 and 2022-23 due to a rise in aggregate production value for both sectors. However, overall, the total direct output across all sectors statewide decreased due to the cessation of native timber harvesting.

Contribution to GSP

In Victoria, the total GSP contributed by the industry in 2022-23 was $4,008.2 million. This includes $1,510.0 million up to the point of sale of primary processed products, and $2,498.3 million from downstream supply chain activity (Table 5-1). Direct activity accounted for 38 per cent of total GSP, with the remainder contributed through flow-on effects.

The total GSP contributed by the softwood forestry industry in Victoria was $2,874.1 million, which was higher than the $905.6 million contributed by the hardwood industry and the $228.6 million contributed by the native forest industry (Table 5-2 to Table 5-4). Total GSP contributed by the forest industry up to primary processing increased for both softwood and hardwood between 2021-22 and 2022-23 due to a rise in aggregate production value for both sectors. However, overall, the total GSP contributed across all sectors statewide decreased due to the cessation of native timber harvesting.

Household income and employment

In Victoria, the total contribution to household income in 2022-23 was $2,357.8 million. This includes $906.0 million up to the point of sale of primary processed products, and $1,451.8 million from downstream supply chain activity (Table 5-1). The total contribution to employment in 2022-23 was 25,065 fte jobs, including 9,327 fte jobs up to the point of sale of primary processed products, and 15,738 fte jobs from downstream supply chain activity (Table 5-1).

The total household income and employment contributed by the softwood forestry industry in Victoria was $1,652.7 million and 17,947 fte jobs, which was higher than the $550.7 million and 5,455 fte jobs contributed by the hardwood industry and the $154.3 million and 1,664 fte jobs contributed by the native forest industry (Table 5-2 to Table 5-4).

The total household income and employment contributed by the forest industry up to primary processing remained relatively stable for softwood between 2021-22 and 2022-23, due to only a minor increase in aggregate production volume. Conversely, the hardwood sector experienced an increase in aggregate production volume, which led to a rise in total household income and employment up to primary processing during the same period. However, the overall total household income and employment across all sectors statewide decreased due to the cessation of native timber harvesting.

Table 5-1 Summary economic contribution of the forest industry to Victoria, including supply chain activity beyond primary processing, 2022-23

	Up to primary processing	Rest of supply chain	Total
Direct output ($m)	**1,347.9**	**3,887.5**	**5,235.5**
GSP ($m)	**1,510.0**	**2,498.3**	**4,008.2**
Direct ($m)	541.3	1,013.3	1,554.5
Flow-on ($m)	968.7	1,485.0	2,453.7
Household Income ($m)	**906.0**	**1,451.8**	**2,357.8**
Direct ($m)	325.0	581.7	906.7
Flow-on ($m)	581.0	870.0	1,451.1
Employment (fte)	**9,327**	**15,738**	**25,065**
Direct (fte)	3,033	6,896	9,928
Flow-on (fte)	6,295	8,842	15,137
Employment (total)	**9,842**	**16,219**	**26,061**
Direct (total)	3,266	6,816	10,081
Flow-on (total)	6,576	9,403	15,980

Source: BDO analysis

Table 5-2 Economic contribution of the softwood forest industry to Victoria, including supply chain activity beyond primary processing, 2022-23

	Up to primary processing	Softwood structural timber supply chain	Rest of supply chain	Total
Direct output ($m)	**853.3**	**824.3**	**1,918.4**	**3,596.0**
GSP ($m)	**958.3**	**964.7**	**951.1**	**2,874.1**
Direct ($m)	391.9	409.3	371.8	1,173.0
Flow-on ($m)	566.4	555.4	579.3	1,701.1
Household Income ($m)	**543.8**	**550.6**	**558.2**	**1,652.7**
Direct ($m)	207.2	220.6	222.3	650.0
Flow-on ($m)	336.7	330.0	335.9	1,002.7
Employment (fte)	**5,592**	**6,143**	**6,212**	**17,947**
Direct (fte)	1,965	2,782	2,799	7,546
Flow-on (fte)	3,627	3,361	3,413	10,402
Employment (total)	**5,923**	**6,309**	**6,445**	**18,677**
Direct (total)	2,120	2,738	2,815	7,672
Flow-on (total)	3,803	3,571	3,630	11,005

Source: BDO analysis

Table 5-3 Economic contribution of the hardwood forest industry to Victoria, including supply chain activity beyond primary processing, 2022-23

	Up to primary processing	Rest of supply chain	Total
Direct output ($m)	**428.2**	**851.4**	**1,279.7**
GSP ($m)	**468.6**	**437.0**	**905.6**
Direct ($m)	137.9	175.3	313.2
Flow-on ($m)	330.7	261.7	592.4
Household Income ($m)	**293.2**	**257.5**	**550.7**
Direct ($m)	91.5	104.9	196.3
Flow-on ($m)	201.7	152.7	354.4
Employment (fte)	**3,023**	**2,432**	**5,455**
Direct (fte)	817	886	1,703
Flow-on (fte)	2,206	1,546	3,752
Employment (total)	**3,173**	**2,478**	**5,652**
Direct (total)	883	832	1,715
Flow-on (total)	2,290	1,646	3,936

Source: BDO analysis

Table 5-4 Economic contribution of the native forest industry to Victoria, including supply chain activity beyond primary processing, 2022-23

	Up to primary processing	Rest of supply chain	Total
Direct output ($m)	**66.4**	**293.4**	**359.8**
GSP ($m)	**83.1**	**145.4**	**228.6**
Direct ($m)	11.5	56.8	68.4
Flow-on ($m)	71.6	88.6	160.2
Household Income ($m)	**69.0**	**85.4**	**154.3**
Direct ($m)	26.4	34.0	60.4
Flow-on ($m)	42.6	51.4	94.0
Employment (fte)	**713**	**951**	**1,664**
Direct (fte)	252	429	680
Flow-on (fte)	461	522	983
Employment (total)	**746**	**986**	**1,732**
Direct (total)	263	431	694
Flow-on (total)	483	555	1,038

Source: BDO analysis

6. Discussion

6.1. Multiplier effect

The multiplier effect refers to the broader economic impact generated by an industry beyond its direct employment or output. Specifically, it captures the indirect jobs and activities supported through the industry's supply chains—such as transportation, equipment manufacturing, and services. In the context of the forest industry, employment multipliers indicate the number of additional jobs supported in the broader economy for every direct job within the sector.

Table 6-1 summarises the employment multipliers for the indirect employment supported by the Victorian forest industry in 2021-22. The multipliers for all industry sectors are noticeably consistent in generating employment (multiplier above 1). This implies that the industry played a consistent role in the economy and that its supply chain links have been relatively growing in 2021-22.

ITable 6-1 Employment multipliers for indirect employment supported by the Victorian forest industry in 2021-22

Type of multiplier	Description	Native forest	Hardwood plantation	Softwood plantation
		2021-22	2021-22	2021-22
Type I	Direct jobs + production induced jobs	1.8	2.4	1.8
Type II	Direct jobs + production induced jobs + consumption induced jobs	2.9	3.8	2.9

Source: BDO analysis

6.2. Summary of results, 2022-23

Following the completion of the 2021-22 economic contribution analysis, this study was extended to include economic contribution indicators for 2022-23. The scope of these estimates was broadened to incorporate supply chain activity through to the final user.

When interpreting the results, it is important to consider that the 2021-22 estimates are based on primary data collection for that specific year, involving over 90 businesses. The data collection and analysis method focused on accurately estimating the amount of local economic activity generated by locally grown products. In contrast, the 2022-23 analysis aimed to provide up-to-date information for a more recent year and to explore how publicly available secondary data could be used to understand activity along the supply chain. These estimates are valuable for understanding the volume of activity within local supply chains for local products and how economic contributions changed between years, though with a lower degree of accuracy.

In 2022-23, the direct value of output generated by the Victorian forest industry up to the point of sale of primary processed products was $1,347.9 million, and $5,235.5 million including downstream supply chain activity (Table 6-5). The industry contributed $4,008.2 million in total to GSP and supported 25,065 fte jobs in 2022-23. Up to the point of sale of primary processed products, all indicators decreased between 2021-22 and 2022-23 due to the cessation of native timber harvesting (Table 6- and Table 6-5).

Table 6-5 Summary economic contribution of the forest industry to Victoria, including supply chain activity beyond primary processing, 2022-23

	Up to primary processing	Rest of supply chain	Total
Direct output ($m)	**1,347.9**	**3,887.5**	**5,235.5**

GSP ($m)	**1,510.0**	**2,498.3**	**4,008.2**
Direct ($m)	541.3	1,013.3	1,554.5
Flow-on ($m)	968.7	1,485.0	2,453.7
Household Income ($m)	**906.0**	**1,451.8**	**2,357.8**
Direct ($m)	325.0	581.7	906.7
Flow-on ($m)	581.0	870.0	1,451.1
Employment (fte)	**9,327**	**15,738**	**25,065**
Direct (fte)	3,033	6,896	9,928
Flow-on (fte)	6,295	8,842	15,137
Employment (total)	**9,842**	**16,219**	**26,061**
Direct (total)	3,266	6,816	10,081
Flow-on (total)	6,576	9,403	15,980

Source: BDO analysis

6.3. Limitations

An economic contribution analysis and the associated indicators aim to describe the existing amount of economic activity that is supported by a particular activity during a period of time. This is useful to produce a snapshot of the economic activity contributed by the forest industry in a given year.

When interpreting the economic contribution indicators, it is important to consider that these indicators cannot be directly applied to identify an expected change in economic activity given a change in forestry activity, such as the change due to natural disasters, biosecurity or regulation changes. This would need an economic impact analysis (to measure a change in activity) rather than an economic contribution analysis (to measure a snapshot of activity).

As the results in this report are a snapshot of the forest industry in a given year, these results only consider the economic activity associated with that year. When interpreting the economic indicators, it is also therefore important to consider the context of the 2021-22 and 2022-23 years for the industry. For example, some relevant factors that would heavily influence the results year to year include restricted trade with China, supply and demand of timber products, investment and expansion in the industry, as well as innovation and new product development.

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