

Economic Impact of the Timber Industry in the Green Triangle Region, 2003/04

A report prepared for
Green Triangle Regional Plantation Committee Inc.
and
Forestry SA

Prepared by
EconSearch Pty Ltd

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EconSearch Pty Ltd
PO Box 746, Unley BC SA 5061
Tel: (08) 8357 9560
Fax: (08) 8357 2299
www.econsearch.com.au

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Abbreviations

ABARE	Australian Bureau of Agricultural and Resource Economics
ABS	Australian Bureau of Statistics
GTR	Green Triangle Region
GTRPC	Green Triangle Regional Plantation Committee Inc.
GRP	Gross Regional Product
GSP	Gross State Product
LGA	Local Government Area
PIRSA	Primary Industries and Resources South Australia
SE SA	South East South Australia
SW Vic	South West Victoria
SD	Statistical Division
SLA	Statistical Local Area

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Executive Summary

The broad objective of this study was to provide indicators of the timber industry's (i.e. plantation forestry and timber processing) contribution to the regional economies of South East South Australia (SE SA) and South West Victoria (SW Vic) and, collectively, for the Green Triangle regional economy in 2003/04.

The work was commissioned by John Kellas, Executive Officer, Green Triangle Regional Plantation Committee Inc. (GTRPC) and was jointly funded by Forestry SA. The survey work, data collection, modelling and report production were undertaken by Matthew Ferris and Julian Morison (EconSearch Pty Ltd).

The approach to the analysis was similar to that adopted by EconSearch in the preparation of the previous reports for the SE SA regional economy (EconSearch 1998 and 2001), it involved:

- the collection of primary industries data for the region for 2003/04, including a survey of plantation forestry and timber processing firms;
- a brief regional profile and the preparation (SW Vic) and update to 2003/04 (SE SA) of input-output models for the analysis; and
- estimation of the economic impact of forestry, timber processing, agriculture and the processing of agricultural products in the Green Triangle region.

Survey of plantation forestry and timber processing firms

The survey of plantation forestry and timber processing firms commenced in early February 2005, based on the GTRPC contact database. Detailed follow-up was undertaken by telephone, fax and e-mail during February and March 2005. The distribution of questionnaires and subsequent follow-up was undertaken by EconSearch.

At least 95 per cent of the forest plantation in the Green Triangle region by area and over 90 per cent of the timber processing activity by value was accounted for by the 16 completed, relevant responses to the survey. Those firms that did not respond were thought to be minor operators relative to the total size of the industry.

Regional profile and model preparation

An input-output table for the SE SA region for 2002/03 has been recently prepared by EconSearch (2005). This model required a number of adjustments in order to update it to 2003/04. The input-output table for the SW Vic region was constructed using the RAS method supplemented by data gathered from a variety of other sources. These sources included the Australian Bureau of Statistics, Australian Taxation Office, Department of Employment and Workplace Relations and information collected from the timber industry survey.

Some of the key measures of economic activity in the SE SA, SW Vic and Green Triangle regions in 2003/04 are provided in Table 1.

Table 1 Key measures of economic activity in the SE SA, SW Vic and Green Triangle regions, 2003/04

	South East SA		South West Victoria		Green Triangle
	Value	Share of SA	Value	Share of Vic	
Gross Regional Product (\$b)	2.49	4.6%	2.42	1.2%	4.90
Employment (no. of jobs)	34,130	4.8%	38,643	1.6%	72,773
Population (30 June 2004)	63,040	4.1%	88,422	1.8%	151,462

Note: Totals may contain rounding.

Source: EconSearch analysis

Results of the impact analysis

Based on data gathered from the timber industry survey (including the regional value of production in the plantation forestry and wood and paper processing industries), the objective of the analysis was to estimate the flow-on (or indirect) effects generated by that production. Estimates of the (direct and indirect) economic impact of the forestry and timber processing industries in the SE SA, SW Vic and Green Triangle regional economies in 2003/04 are provided below in terms of contribution to GRP and employment.

It is important to note that the estimates of economic impact for the Green Triangle region are not a simple aggregation of the estimates for the component regions of SE SA and SW Vic. The broader Green Triangle regional economy is less reliant on imported goods and services than either SE SA or SW Vic because of the trade that occurs between these regions. Reduced expenditure on imported goods and services results in more local economic activity.

- The direct contribution to GRP generated by the wood and paper products sector in the Green Triangle region (from output valued at \$840 million) was around \$401 million in 2003/04 (Table 2).
- Associated with this was GRP in the forestry sector of over \$114 million (from output valued at \$214 million).
- The flow-on GRP to other sectors in the Green Triangle region summed to almost \$263 million.
- The flow-ons were greatest in the trade, transport, ownership of dwellings, business services, other manufacturing, utilities and finance sectors.
- Directly and indirectly, the timber industry (i.e. forestry and processing) contributed over \$778 million to GRP for the Green Triangle regional economy in 2003/04, approximately 16 per cent of the total.
- Direct employment generated by the wood and paper products sector in the Green Triangle region was around 3,400 and in the forestry sector approximately 830 in 2003/04.
- Flow-on employment to other sectors in the region as a result of timber industry activity summed to almost 4,600 jobs.

- Directly and indirectly, the timber industry (i.e. forestry and processing) generated almost 8,800 jobs in the Green Triangle region in 2003/04, approximately 12 per cent of the total.

Table 2 The economic impact of the timber industry in SE SA, SW Vic and the Green Triangle region, 2003/04

	Contribution to GRP (\$m) ^a			Employment (no. jobs) ^b		
	SE SA ^c	SW Vic	Green Triangle	SE SA ^c	SW Vic	Green Triangle
Direct						
Forestry	98	16	114	614	215	829
Wood and Paper	368	32	401	3,052	297	3,354
Indirect (flow-on)	197	49	263	3,416	882	4,582
Total timber industry	664	97	778	7,082	1,394	8,765
Regional total	2,488	2,416	4,905	34,130	38,643	72,773
Proportion of region	27%	4%	16%	21%	4%	12%

Note: Totals may contain rounding.

^a GRP impacts are a measure of contribution to gross regional product. Estimates are in 2003/04 dollars.

^b Employment impacts are measured in terms of the number of full-time and part-time jobs.

^c The relative contribution of the timber industry in SE SA would appear to have declined over time (30 per cent of GRP in 1995/96 and 28 per cent in 1998/99; 26 per cent of employment in 1995/96 and 24 per cent in 1998/99). This could be as a result of growth in other sectors of the regional economy (e.g. tourism and the ownership of dwellings), although the possibility that indirect impacts were overestimated for the years 1995/96 and 1998/99 also needs to be taken into account.

Source: EconSearch analysis

To put these estimates into perspective, primary industries¹ in the Green Triangle region were estimated to have directly and indirectly contributed approximately 54 per cent of GRP (61 per cent in SE SA and 44 per cent in SW Vic) and 53 per cent of regional employment (59 per cent in SE SA and 46 per cent in SW Vic) in 2003/04.

¹ Primary industries have been defined to include agriculture, viticulture, horticulture, food products processing, wineries, plantation forestry and wood and paper products processing. The definition excludes mining and energy, fishing and aquaculture and any processing of these products that might take place in the regions.

1. Introduction

1.1 Background

The broad objective of this study was to provide indicators of the timber industry's (i.e. plantation forestry and timber processing) contribution to the regional economies of South East South Australia and South West of Victoria and, collectively, for the Green Triangle regional economy in 2003/04. Specifically, the task involved the preparation of the following tables.

- The direct and indirect impact of forestry and timber processing in terms of contribution to gross regional product².
- The direct and indirect impact of forestry and timber processing in terms of employment.
- The direct and indirect impact of primary industries³ in terms of value of output, contribution to gross regional product, employment and household income.

In addition, time series estimates of the timber industry's contribution to the regional economy of South East South Australia (SE SA) have been prepared for the years 1995/96 and 1998/99, based on previous work undertaken by EconSearch (1998 and 2001).

The work was commissioned by John Kellas, Executive Officer, Green Triangle Regional Plantation Committee Inc. (GTRPC) and was jointly funded by Forestry SA. The survey work, data collection, modelling and report production were undertaken by Matthew Ferris and Julian Morison (EconSearch Pty Ltd).

1.2 Approach to the Analysis

The approach to the analysis was similar to that adopted by EconSearch in the preparation of the previous reports for the SE SA regional economy (EconSearch 1998 and 2001). There were three steps involved in undertaking the project:

1. the collection of primary industries data for the region for 2003/04, including a survey of plantation forestry and timber processing firms;
2. a brief regional profile and the preparation (SW Vic) and update to 2003/04 (SE SA) of input-output models for the analysis; and
3. estimation of the economic impact of forestry, timber processing, agriculture and the processing of agricultural products in the Green Triangle region.

An outline of the indicators of economic impact used in the analysis is provided in Section 2 of the report. The three primary steps to the analysis are outlined in more detail in Sections 3 to 5, respectively.

² The terminology 'contribution to gross regional product' and 'value added' can be used interchangeably. 'Value added' was used in previous reports (EconSearch 1998 and 2001).

³ Primary industries have been defined to include agriculture, viticulture, horticulture, food products processing, wineries, plantation forestry and wood and paper products processing. The definition excludes mining and energy, fishing and aquaculture and any processing of these products that might take place in the regions.

2. Measures of Economic Impact

The focus of this report is a statement of regional economic impact (i.e. so many jobs, so much income, etc.) arising from timber industry and other primary industry activity. The results of the analysis do not indicate whether the costs to the regions of this activity outweigh the benefits. An assessment of this nature would require a comprehensive cost-benefit analysis.

Estimates of economic impact or economic contribution are presented in terms of the following indicators⁴:

- output;
- contribution to gross regional product;
- employment; and
- household income.

(Value of) Output is a measure of the gross revenue of goods and services produced by commercial organisations (e.g. farm-gate value of production) and gross expenditure by government agencies. Total output needs to be used with care as it includes elements of double counting (e.g. the value of timber mill output includes the plantation-gate value of saw logs). For this reason, only direct output impacts are reported.

Contribution to gross regional product (GRP) is a measure of the net contribution of an activity to the regional economy. Contribution to gross regional product is measured as value of output less the cost of goods and services (including imports) used in producing the output. In other words, it can be measured as household income plus other value added (gross operating surplus and all taxes, less subsidies). It represents payments to the primary inputs of production (labour, capital and land). Using contribution to GRP as a measure of economic impact avoids the problem of double counting that may arise from using value of output for this purpose.

Employment is a measure of the number of working proprietors, managers, directors and other employees, in terms of the number of full-time and part-time jobs.

Household income is a component of GRP and is a measure of the wages and salaries and other payments to labour including overtime payments and income tax, but excluding payroll tax.

Estimates of economic impact are presented in terms of

- direct impacts;
- flow-on (or indirect) impacts; and
- total impacts.

Direct impacts are the initial round of output, employment and household income generated by an economic activity, in this case plantation forestry and wood and paper processing.

⁴ See Appendix 2 for a more detailed glossary of input-output terminology.

Flow-on (or indirect) impacts are the sum of production-induced effects and consumption-induced effects. Production-induced effects are additional output, employment and household income resulting from re-spending by firms (e.g. forestry contractors) that receive payments from the sale of goods and services to firms undertaking, for example, plantation forestry activities. Consumption-induced effects are additional output, employment and household income resulting from re-spending by households that receive income from employment in direct and indirect activities.

Total impacts are the sum of direct and flow-on impacts.

3. Data Collection

There were two key data collection tasks undertaken for this project; the first a survey of timber industry firms in the region and the second, the compilation of information on agricultural, viticultural and horticultural value of output and employment (on-farm and processing) in the region. These tasks are described in more detail below.

3.1 Timber Industry Survey for the Green Triangle Region

An outline of the timber industry survey conducted for this project is provided below. Details are provided of the nature of the information sought, the firms and organisations contacted, survey response rate and the processing of completed questionnaires.

Questionnaire

To enable the estimation of the impact of the timber industry in the Green Triangle region, a questionnaire was prepared for completion by plantation forestry and timber processing firms and other organisations that undertake related activity in the region.

The questions were designed to elicit:

- the nature of the firm's timber industry activity;
- the firm's employment levels and total wages and salaries;
- estimates of employment and the nature of goods and services provided by contractors to the firm;
- the magnitude of other costs incurred by the firm in the course of conducting timber industry operations; and
- a breakdown of timber industry related earnings and market share by broad category.

Respondents were asked to indicate in which region their timber industry operations occur (i.e. SE SA or SW Vic) and to apportion, where possible, employment, costs and revenue between these regions. The questionnaire is reproduced in Appendix 1.

A covering letter for the questionnaire was prepared on GTRPC letterhead to encourage individual organisations to participate in the survey. It outlined the background and objectives of the study, explained why the survey was required and indicated that all survey data would be treated in confidence. A copy of the covering letter is also reproduced in Appendix 1.

Firms who received the questionnaire

The contact list of timber industry firms and organisations for inclusion in the survey (39 in total) was compiled in consultation with John Kellas (GTRPC) and was based on the GTRPC contact database.

The covering letter and questionnaire were sent by post in early February 2005. Detailed follow-up was undertaken by telephone, fax and e-mail during February and March 2005. The distribution of questionnaires and subsequent follow-up was undertaken by EconSearch.

Responses

A summary of the nature and extent of the responses to the timber industry survey in the Green Triangle region is provided in Table 3.1. While the 'response rate' appears to be low it is important to note that at least 95 per cent of the forest plantation in the Green Triangle region by area and over 90 per cent of the timber processing activity by value was accounted for by the 16 completed, relevant responses. That is, those firms that did not respond were thought to be minor operators relative to the total size of the industry.

Table 3.1 Green Triangle timber industry survey respondents

Total number of firms to which questionnaires were sent	39
Number of firms with no reported timber industry activity in the region	2
Number of firms found to be timber industry service providers only	2
Net total of firms from whom data were sought	35
Non-respondents	
cited confidentiality restrictions	2
incorrect contact details ^a	8
no response despite follow up	9
Total non-respondents	19
Number of completed, relevant responses	16

^a Incorrect postal address and/or phone number.

Processing and safeguarding of completed questionnaires

Upon receipt of completed questionnaires, the responses were scrutinised for comprehensiveness and internal consistency with follow-up phone calls undertaken to seek further information or clarify inconsistencies, where necessary.

The data were recorded electronically and the completed questionnaires have been destroyed. The name/company of the survey respondent was separated from the statistical return and stored in a separate location to enhance the security of the data storage arrangements.

3.2 Primary Industries Data

An important step in the analysis was the collection and collation of value of output, contribution to GRP and employment estimates for forestry, timber processing, agriculture and the processing of agricultural products in the region. These data were necessary:

- in order to quantify the contribution of the timber industry to regional economic activity, relative to the contribution of agriculture and agricultural processing; and
- to validate the information collected from the timber industry survey.

For the purpose of this analysis, and to maintain consistency with previous studies (EconSearch 1998 and 2001), primary industries have been defined to include agriculture, viticulture, horticulture, food products processing, wineries, plantation forestry and wood and paper products processing. The definition excludes mining and energy, fishing and aquaculture and any processing of these products that might take place in the regions.

The relevant data have been drawn from a number of sources, including:

- Australian Bureau of Statistics (ABS) *AgStats 2001* (census) and subsequent surveys;
- Australian Bureau of Agricultural and Resource Economics (ABARE);
- Forestry SA;
- Primary Industries and Resources South Australia (PIRSA) *Regional Scorecards*; and
- Lloyd (2004) *Limestone Coast Plantation Timber 2005 and Beyond*.

The data collection process involved sourcing relevant publications, electronic data and 'special requests' from the above organisations. Broader, region-wide data required for the preparation and update of the regional input-output models was collected at the same time.

4. Regional Profile and Model Preparation

4.1 Regional Profile

The Green Triangle region, as defined for the purpose of this study, is the same as that used in Lloyd (2004), as illustrated in Figure 4.1.

The SE SA sub-region is comprised of the District Councils of Robe, Tatiara, Grant, Lacedpede, Wattle Range, Naracoorte-Lucindale and the City of Mount Gambier. The boundaries of the region correspond to the South East Statistical Division (SD) as defined by the ABS. This means that published production and financial data does, for the most part, correspond to such boundaries. Some of the key measures of economic activity in the SE SA region in 2003/04 were as follows⁵:

- Gross Regional Product (GRP) was estimated to be \$2.49 billion (4.6 per cent of South Australian Gross State Product⁶);
- total employment was estimated to be 34,130 jobs (4.8 per cent of the South Australian state total⁷); and
- the total resident population at 30 June 2004 was estimated to be 63,040 persons (4.1 per cent of the South Australian state total⁸).

The SW Vic sub-region is comprised of the Local Government Areas (LGAs) of West Wimmera, Southern Grampians, Glenelg, Moyne and the City of Warrnambool. This region does not correspond with an ABS Statistical Division and the published production and financial data has been compiled by sourcing information on a Statistical Local Area (SLA) basis⁹. Some of the key measures of economic activity in the SW Vic region in 2003/04 were as follows¹⁰:

- GRP was estimated to be \$2.42 billion (1.2 per cent of Victorian Gross State Product¹¹);
- total employment was estimated to be 38,643 jobs (1.6 per cent of the Victorian state total¹²); and
- the total resident population at 30 June 2004 was estimated to be 88,422 persons (1.8 per cent of the Victorian state total¹³).

⁵ Regional estimates for 2002/03 were derived from EconSearch (2005) and updated to 2003/04, as outlined in Section 4.2.

⁶ Estimated to be \$53.897 billion in 2003/04 (ABS 2005a).

⁷ Estimated to be 710,000 jobs in 2003/04 (DEWR 2005).

⁸ Estimated to be 1,534,250 persons at 30 June 2004 (ABS 2005b).

⁹ The SW Vic region is comprised of the SLAs of West Wimmera, Southern Grampians – Hamilton, Southern Grampians – Wannon, Southern Grampians – Balance, Glenelg – Heywood, Glenelg – North, Glenelg – Portland, Moyne – North-East, Moyne – North-West, Moyne – South and Warrnambool (C).

¹⁰ Regional estimates were derived from the input-output table constructed specifically for this project, as outlined in Section 4.2.

¹¹ Estimated to be \$206.733 billion in 2003/04 (ABS 2005a).

¹² Estimated to be 2,401,300 jobs in 2003/04 (DEWR 2005).

¹³ Estimated to be 4,972,779 persons at 30 June 2004 (ABS 2005b).

In aggregate, GRP in the Green Triangle region in 2003/04 was estimated to be \$4.91 billion, total employment was estimated to be 72,773 jobs and total resident population was estimated to be 151,462 persons.

Figure 4.1 The Green Triangle region



Source: Lloyd (2004).

The regional softwood plantation resource (166,000 ha in 2003/04) is concentrated in the LGAs of Wattle Range, Grant and Glenelg (approximately 89 per cent of the total). The hardwood plantation resource (113,000 ha in 2003/04) is somewhat more widely distributed, with the LGAs of Naracoorte-Lucindale, Wattle Range, Grant, Glenelg, West Wimmera and Southern Grampians accounting for approximately 99 per cent of total plantings (Lloyd 2004). Regional timber processing activity is concentrated in the LGAs of Wattle Range, Grant, Mount Gambier and Glenelg.

The plantation resource as a proportion of total land area in the SE SA, SW Vic and Green Triangle regions is outlined in Table 4.1.

Table 4.1 Total plantation area and land area, Green Triangle region, 2003/04

Region	Plantation Area (ha) ^a	Total Land Area (ha) ^b	Plantation Area as a Proportion of Total
SE SA	133,506	1,771,939	7.5%
SW Vic	145,925	2,775,570	5.3%
Green Triangle	279,431	4,547,509	6.1%

^a Derived from Lloyd (2004). Estimates include 2003 plantings.

^b ABS Regional Profiles (www.ausstats.abs.gov.au).

4.2 Model Preparation and Update

The regional input-output table for the SE SA region for 2003/04 was based on a model for the same region for 2002/03 that was recently prepared by EconSearch as part of a project for the Regional Communities Consultative Council, Local Government Association of SA and Regional Development SA (EconSearch 2005).

This model required a number of adjustments for the purpose of this study, specifically, an update from 2002/03 to 2003/04 of the value of output estimates in agricultural and agricultural processing sectors¹⁴ and some of other key indicators of regional economic activity¹⁵. It was assumed that the basic structure of the economy did not change significantly between 2002/03 and 2003/04.

The input-output table for the SW Vic region was constructed using the RAS method¹⁶ supplemented by data gathered from a variety of other sources. These sources included:

- Australian Bureau of Statistics ('Journey to Work Employment Data' from the 2001 Census (by special request), 1998/99 Household Expenditure Survey, ABS (2005a and 2005b), 1998/99 National Input-Output Table, etc.)
- Australian Taxation Office;
- Department of Employment and Workplace Relations (DEWR 2005);
- Information collected from the timber industry survey; and
- A range of other sources as outlined in Section 3.2.

The preliminary input-output table for the SW Vic region for 2003/04 was developed by applying the RAS method to the SE SA regional table for 2002/03 and subsequently

¹⁴ From the PIRSA *Regional Scorecard* for the Limestone Coast Regional Development Board region (Jack Langberg, PIRSA, pers. comm.).

¹⁵ These indicators included price changes in other sectors of the regional economy (updated using Consumer Price Index for Adelaide from ABS, National Information Referral Service), changes in employment (updated using DEWR (2005)) and changes in GRP (updated using ABS (2005a)).

¹⁶ RAS is a bi-proportional iterative adjustment procedure designed to modify a base matrix to fit new row and column totals. The row and column totals are adjusted proportionally to the new row and column totals, in turn, and the cycle repeated until the actual row and column totals converge to the specified values. This procedure allows estimation of intermediate inputs (transactions) in the input-output table for which alternative estimates are not available. The Australian Bureau of Statistics uses this method in updating the national input-output table. The method is illustrated in Appendix A of ABS Cat. No. 5209, *Australian National Accounts, Input-Output Tables, 1996/97* (ABS 2001).

refined by applying various adjustment procedures. The computer program to make these adjustments was IOW, developed by West (2005). This software was also used to calculate industry multipliers and to estimate the impacts of the various primary industries at the regional level¹⁷.

The input-output models provide a consistent base to present the plethora of economic data available for analysis of regional economies and allow the economic contribution of forestry, timber processing, agriculture and the processing of agricultural products to be estimated relative to other sectors in the regional economy.

¹⁷ See Appendix 3 for an outline of input-output methodology.

5. The Economic Impact of Forestry, Agriculture and Associated Processing in the Green Triangle Region

5.1 Introduction

The main objective of this study was to measure the economic impact in the SE SA, SW Vic and Green Triangle regional economies in 2003/04 of forestry, timber processing, agriculture and the processing of agricultural products.

In order to meet this objective, it was necessary to obtain estimates of the regional value of production (output) of these industries, through published sources and a timber industry survey, and estimate the flow-on effects generated by that production. The flow-on effects are those impacts generated by the purchase of materials, services, labour and capital by forestry and agricultural producers and by the processing, marketing and handling of forestry and agricultural products.

The flow-on effects have been estimated using the input-output models outlined in Section 4.2. The standard approach for the estimation of the regional economic impact of a particular activity, such as the timber industry, is to employ input-output analysis. See Appendix 2 for a glossary of input-output terminology and Appendix 3 for an outline of input-output methodology.

Estimates of the economic impact of forestry, timber processing, agriculture and the processing of agricultural products in SE SA are provided in Section 5.2 of the report. Similar estimates for SW Vic and the Green Triangle region are provided in Sections 5.3 and 5.4, respectively.

5.2 Economic Impacts in South East South Australia

5.2.1 Economic impact of the timber industry in SE SA, 2003/04

Estimates of the economic impact of the forestry and timber processing industries in the SE SA regional economy are provided below in terms of contribution to GRP (Table 5.1) and employment (Table 5.2).

- The direct contribution to GRP generated by the wood and paper products sector (from output valued at \$748 million) was around \$368 million in 2003/04 (Table 5.1).
- Associated with this was GRP in the forestry sector of over \$98 million (from output valued at \$160 million).
- The flow-on GRP to other sectors in the SE SA region summed to over \$197 million.
- The flow-ons were greatest in the trade (\$39 million), transport (\$32 million), ownership of dwellings (\$31 million), business services (\$18 million), utilities (\$12 million) and finance (\$10 million) sectors.
- Directly and indirectly, the timber industry (i.e. forestry and processing) contributed over \$664 million to GRP for the SE SA regional economy in 2003/04, approximately 27 per cent of the total.

Table 5.1 The direct and indirect GRP impacts of forestry and timber processing, SE SA, 2003/04 (\$'000) ^a

Sector	Final demand	Industrial support	Consumption induced	Total Impact	Proportion of total	Flow-on impacts	Proportion of flow-ons
Sheep	0	675	525	1,199	0.2%	1,199	0.4%
Grains	0	20	136	156	0.0%	156	0.1%
Beef	0	86	1,112	1,198	0.2%	1,198	0.4%
Dairy	0	47	610	657	0.1%	657	0.2%
OthLS	0	6	77	83	0.0%	83	0.0%
OthAg	0	279	1,312	1,591	0.2%	1,591	0.5%
ServAg	0	398	145	543	0.1%	543	0.2%
Forestry	39,599	58,292	587	98,478	14.8%	58,879	19.7%
Fishing	0	64	455	520	0.1%	520	0.2%
Mining	0	1,003	252	1,255	0.2%	1,255	0.4%
FoodPrd	0	207	2,695	2,902	0.4%	2,902	1.0%
Wine	0	59	324	383	0.1%	383	0.1%
WdPaper	325,817	39,007	3,497	368,322	55.4%	42,504	14.2%
OthMan	0	7,820	1,606	9,426	1.4%	9,426	3.2%
Utilities	0	9,730	2,176	11,906	1.8%	11,906	4.0%
BldgCon	0	5,130	1,802	6,931	1.0%	6,931	2.3%
Trade	0	20,973	18,011	38,984	5.9%	38,984	13.0%
AccmRest	0	1,206	3,501	4,707	0.7%	4,707	1.6%
Tport	0	30,170	2,218	32,388	4.9%	32,388	10.8%
Comm	0	1,680	1,799	3,479	0.5%	3,479	1.2%
Finance	0	3,285	6,793	10,078	1.5%	10,078	3.4%
ODwell	0	0	31,205	31,205	4.7%	31,205	10.4%
BusServ	0	14,487	3,560	18,047	2.7%	18,047	6.0%
PAdmin	0	1,824	570	2,394	0.4%	2,394	0.8%
Educn	0	963	3,397	4,361	0.7%	4,361	1.5%
Health	0	353	5,207	5,560	0.8%	5,560	1.9%
RecServ	0	494	2,143	2,637	0.4%	2,637	0.9%
PersServ	0	656	4,226	4,882	0.7%	4,882	1.6%
TOTAL	365,417	198,913	99,943	664,272	100.0%	298,856	100.0%
MULTIPLIER	1.0	0.5	0.3	1.8	-	0.8	-

^a GRP impacts are a measure of contribution to gross regional product. Estimates are in 2003/04 dollars.

Source: EconSearch analysis.

Table 5.2 The direct and indirect employment impacts of forestry and timber processing, SE SA, 2003/04 (no. of jobs) ^a

Sector	Final demand	Industrial support	Consumption induced	Total Impact	Proportion of total	Flow-on impacts	Proportion of flow-ons
Sheep	0	16	12	29	0.4%	29	0.7%
Grains	0	0	1	1	0.0%	1	0.0%
Beef	0	2	20	22	0.3%	22	0.5%
Dairy	0	1	13	14	0.2%	14	0.3%
OthLS	0	0	2	2	0.0%	2	0.1%
OthAg	0	3	13	16	0.2%	16	0.4%
ServAg	0	10	4	13	0.2%	13	0.3%
Forestry	247	363	4	614	8.7%	367	8.9%
Fishing	0	2	11	12	0.2%	12	0.3%
Mining	0	4	1	5	0.1%	5	0.1%
FoodPrd	0	4	47	51	0.7%	51	1.2%
Wine	0	0	3	3	0.0%	3	0.1%
WdPaper	2,700	323	29	3,052	43.1%	352	8.5%
OthMan	0	192	39	232	3.3%	232	5.6%
Utilities	0	55	12	68	1.0%	68	1.6%
BldgCon	0	56	20	75	1.1%	75	1.8%
Trade	0	659	566	1,225	17.3%	1,225	29.6%
AccmRest	0	43	125	168	2.4%	168	4.1%
Tport	0	521	38	559	7.9%	559	13.5%
Comm	0	20	21	41	0.6%	41	1.0%
Finance	0	30	61	91	1.3%	91	2.2%
ODwell	0	0	0	0	0.0%	0	0.0%
BusServ	0	259	64	322	4.5%	322	7.8%
PAdmin	0	32	10	42	0.6%	42	1.0%
Educn	0	24	85	109	1.5%	109	2.6%
Health	0	9	137	147	2.1%	147	3.5%
RecServ	0	9	39	48	0.7%	48	1.2%
PersServ	0	17	108	124	1.8%	124	3.0%
TOTAL	2,947	2,651	1,484	7,082	100.0%	4,135	100.0%
MULTIPLIER	1.0	0.9	0.5	2.4	-	1.4	-

^a Employment impacts are measured in terms of the number of full-time and part-time jobs.

Source: EconSearch analysis.

- The direct employment generated by the wood and paper products sector was over 3,000 in 2003/04. Direct employment in the forestry sector was around 600 (Table 5.2)
- Flow-on employment to other sectors in the region as a result of timber industry activity summed to over 3,400 jobs.

- The flow-ons were greatest in the trade (1,220), transport (560), business services (320), other manufacturing (230) and accommodation, cafes and restaurants (170) sectors.
- Directly and indirectly, the timber industry (i.e. forestry and processing) generated almost 7,100 jobs in the SE SA region in 2003/04, almost 21 per cent of the total.

5.2.2 Total economic impact of primary industries, SE SA, 2003/04

Estimates of the direct and indirect impact of forestry, timber processing, agriculture and the processing of agricultural products in the SE SA region are provided in Table 5.3.

In aggregate, it is clear how significant these primary industries are to the economy of SE SA. In terms of contribution to GRP, forestry, timber processing, agriculture and the processing of agricultural products directly contributed 44 per cent of regional economic activity in 2003/04. This activity generated a further 17 per cent of GRP in flow-on effects, in total generating approximately 61 per cent of GRP. Total employment impacts were slightly less at 59 per cent of the regional total and the household income generated directly and indirectly by these primary industries comprised around 56 per cent of the regional total¹⁸.

¹⁸ Total household income in SE SA in 2003/04 was estimated to be \$1.1 billion.

Table 5.3 The direct and indirect impact of primary industries, SE SA, 2003/04 ^a

	Gross Value of Output ^b	Contribution to GRP	Employment	Household Income
	\$m	\$m	No. of jobs	\$m
Direct Impact of Primary Industries				
Sheep	185.1	105.0	2,497	36.2
Grains	128.9	68.4	332	5.4
Beef	153.5	88.8	1,603	24.1
Dairy	62.1	26.3	578	13.1
Other Livestock	9.2	2.1	62	1.3
Other Agriculture ^c	266.0	154.5	1,513	39.4
Forestry	159.7	98.5	614	29.1
Food Products	199.0	51.2	895	33.4
Wine	499.1	127.1	1,042	31.0
Wood and Paper Products	747.5	368.3	3,052	145.5
Total Direct Impact		1,090.3	12,189	358.2
Proportion of regional total		43.8%	35.7%	32.4%
Indirect Impact of Primary Industries				
Trade		96.8	3,043	76.0
Transport		51.3	885	39.4
Business Services		42.4	758	31.3
Finance		27.9	251	9.9
Other Manufacturing		17.3	425	13.1
Utilities		17.6	100	6.8
Accommodation, Restaurants and Cafes		16.4	586	10.7
Communications		10.2	122	5.6
Ownership of Dwellings		66.3	-	-
Other sectors		80.7	1,729	64.3
Total Indirect Impact		426.9	7,898	257.0
Proportion of regional total		17.2%	23.1%	23.3%
Total Direct plus Indirect Impact of Primary Industries		1,517.2	20,087	615.3
Proportion of regional total		61.0%	58.9%	55.7%

^a Primary industries include, for the purpose of this analysis, forestry, timber processing, agriculture and the processing of agricultural products.

^b Flow-on (indirect) and total output impacts are not reported as there are problems with double counting which can give a misleading impression of the significance of individual industries. For example, the value of saw logs processed locally is included in both the wood and paper products and forestry sectors. If the two values were added together the plantation-gate value of saw logs would be included twice.

^c Includes viticulture, horticulture and other agriculture.

Source: EconSearch analysis.

5.2.3 Economic impact of primary industries in SE SA, time-series

Based on this analysis and previous work undertaken by EconSearch (1998 and 2001) it was possible to compile time-series estimates of the contribution of forestry, timber processing, agriculture and the processing of agricultural products to the regional economy of SE SA for the years 1995/96, 1998/99 and 2003/04.

The direct and indirect impact of the timber industry on regional economic activity over the nine year period is summarised in Table 5.4 and the contribution of forestry, timber processing, agriculture and the processing of agricultural products over the same time period are provided in Table 5.5.

Table 5.4 The direct and indirect GRP and employment impacts of forestry and timber processing, SE SA, 1995/96, 1998/99 and 2003/04 ^a

	Contribution to GRP (\$m)			Employment (no. jobs)		
	1995/96 ^b	1998/99 ^c	2003/04 ^d	1995/96 ^b	1998/99 ^c	2003/04 ^d
Direct						
Forestry	53.2	68.5	98.5	480	696	614
Wood and Paper	210.6	220.3	368.3	2,954	2,662	3,052
Indirect (flow-on)	182.3	194.3	197.5	3,430	3,422	3,416
Total timber industry	446.1	483.1	664.3	6,864	6,780	7,082
Regional total	1,470.1	1,727.7	2,488.2	26,790	27,770	34,130
Proportion of region	30%	28%	27%	26%	24%	21%

^a GRP impacts are a measure of contribution to gross regional product, in nominal dollars. Employment impacts are measured in terms of the number of full-time and part-time jobs.

^b From output valued at \$90m in the forestry sector and \$539m in the wood and paper products sector.

^c From output valued at \$133m in the forestry sector and \$570m in the wood and paper products sector.

^d From output valued at \$160m in the forestry sector and \$748m in the wood and paper products sector.

Source: EconSearch analysis.

Caution needs to be exercised when interpreting these estimates. There are a number of important points that need to be taken into account.

- Estimates of the direct impacts of forestry and timber processing on the regional economy of SE SA for the years 1995/96, 1998/99 and 2003/04 were imputed on the basis of three, distinct surveys. Although the major operators in the industry have responded to each survey, there still exists the possibility of sample bias in the survey results.

Table 5.5 The direct and indirect impact of primary industries, SE SA, 1995/96, 1998/99 and 2003/04 ^a

	Contribution to GRP (\$m)			Employment (no. jobs)		
	1995/96 ^b	1998/99 ^c	2003/04 ^d	1995/96 ^b	1998/99 ^c	2003/04 ^d
Direct	628.7	723.5	1,090.3	9,416	9,702	12,189
Indirect (flow-on)	408.7	400.7	426.9	7,662	7,133	7,898
Total primary industries	1,037.4	1,124.3	1,517.2	17,078	16,835	20,087
Regional total	1,470.1	1,727.7	2,488.2	26,790	27,770	34,130
Proportion of region	71%	65%	61%	64%	61%	59%

^a Primary industries include, for the purpose of this analysis, forestry, timber processing, agriculture and the processing of agricultural products.

^b From output valued at \$1.46 billion.

^c From output valued at \$1.62 billion.

^d From output valued at \$2.41 billion.

Source: EconSearch analysis.

- Estimates of the indirect (flow-on) impacts of forestry, timber processing, agriculture and the processing of agricultural products on the regional economy of SE SA for the years 1995/96, 1998/99 and 2003/04 were generated using different input-output models. In turn, these models were constructed using different data sources and methods.
- The input-output model for 2003/04 was based on a suite of integrated regional models and a state input-output model prepared by EconSearch (2005), in collaboration with the Centre of Policy Studies at Monash University. The latest model for the SE SA regional economy is, therefore, considered to provide a more accurate representation of the structure of the linkages in the regional economy than those used to prepare impact estimates for 1995/96 and 1998/99. Thus, it is possible that the indirect impacts of the timber industry in SE SA were overestimated for the years 1995/96 and 1998/99.

It is apparent, however, that:

- The total GRP impact of the timber industry and all primary industries increased in absolute terms over the period 1995/96 to 2003/04.
- The total employment impact of the timber industry and all primary industries increased in absolute terms over the period 1995/96 to 2003/04. The less than proportional increase in employment impacts probably reflects economy-wide labour productivity improvements.
- The declining relative contribution of the timber industry and all primary industries could be as a result growth in other sectors of the regional economy (e.g. the wine sector, tourism and other service industries).

5.3 Economic Impacts in South West Victoria

5.3.1 Economic impact of the timber industry in SW Vic, 2003/04

Estimates of the economic impact of the forestry and timber processing industries in the SW Vic regional economy are provided below in terms of contribution to GRP (Table 5.6) and employment (Table 5.7).

- The direct contribution to GRP generated by the wood and paper products sector (from output valued at \$92 million) was around \$32 million in 2003/04 (Table 5.6).
- Associated with this was GRP in the forestry sector of approximately \$16 million (from output valued at \$54 million).
- The flow-on GRP to other sectors in the SW Vic region summed to over \$49 million.
- The flow-ons were greatest in the trade (\$11 million), transport (\$11 million), business services (\$6 million), ownership of dwellings (\$6 million), finance (\$3 million) and other manufacturing (\$2 million) sectors.
- Directly and indirectly, the timber industry (i.e. forestry and processing) contributed over \$97 million to GRP for the SW Vic regional economy in 2003/04, approximately 4 per cent of the total.
- Direct employment generated by the wood and paper products sector was around 300 and in the forestry sector around 220 in 2003/04 (Table 5.7).
- Flow-on employment to other sectors in the region as a result of timber industry activity summed to almost 900 jobs.
- The flow-ons were greatest in the trade (340), transport (180), business services (90), accommodation, cafes and restaurants (50) and health (40) sectors.
- Directly and indirectly, the timber industry (i.e. forestry and processing) generated almost 1,400 jobs in the SW Vic region in 2003/04, almost 4 per cent of the total.
- The higher GRP and employment multipliers associated with the forestry and timber processing industries in SW Vic (Tables 5.6 and 5.7) relative to SE SA (Tables 5.1 and 5.2) reflect the fact that much of the potential income from existing plantations in SW Vic is yet to be realised, thus expenditure on local goods and services comprise a higher proportion of current output (sales).

Table 5.6 The direct and indirect GRP impacts of forestry and timber processing, SW Vic, 2003/04 (\$'000) ^a

Sector	Final demand	Industrial support	Consumption induced	Total Impact	Proportion of total	Flow-on impacts	Proportion of flow-ons
Sheep	0	23	76	99	0.1%	99	0.2%
Grains	0	1	8	9	0.0%	9	0.0%
Beef	0	7	70	77	0.1%	77	0.1%
Dairy	0	5	52	57	0.1%	57	0.1%
OthLS	0	0	0	0	0.0%	0	0.0%
OthAg	0	109	55	164	0.2%	164	0.3%
ServAg	0	255	14	268	0.3%	268	0.5%
Forestry	8,298	7,645	2	15,944	16.4%	7,647	13.5%
Fishing	0	2	57	60	0.1%	60	0.1%
Mining	0	130	13	143	0.1%	143	0.3%
FoodPrd	0	37	395	433	0.4%	433	0.8%
Wine	0	39	49	88	0.1%	88	0.2%
WdPaper	32,255	141	6	32,402	33.3%	146	0.3%
OthMan	0	1,724	369	2,093	2.1%	2,093	3.7%
Utilities	0	582	560	1,142	1.2%	1,142	2.0%
BldgCon	0	539	138	677	0.7%	677	1.2%
Trade	0	6,764	4,279	11,043	11.3%	11,043	19.4%
AccmRest	0	361	1,125	1,486	1.5%	1,486	2.6%
Tport	0	10,363	509	10,872	11.2%	10,872	19.1%
Comm	0	540	478	1,018	1.0%	1,018	1.8%
Finance	0	1,247	1,286	2,533	2.6%	2,533	4.5%
ODwell	0	0	5,949	5,949	6.1%	5,949	10.5%
BusServ	0	4,795	1,036	5,831	6.0%	5,831	10.3%
PAdmin	0	441	140	580	0.6%	580	1.0%
Educn	0	276	959	1,235	1.3%	1,235	2.2%
Health	0	120	1,382	1,502	1.5%	1,502	2.6%
RecServ	0	108	564	672	0.7%	672	1.2%
PersServ	0	127	866	993	1.0%	993	1.7%
TOTAL	40,553	36,379	20,438	97,370	100.0%	56,817	100.0%
MULTIPLIER	1.0	0.9	0.5	2.4	-	1.4	-

^a GRP impacts are a measure of contribution to gross regional product. Estimates are in 2003/04 dollars.

Source: EconSearch analysis.

Table 5.7 The direct and indirect employment impacts of forestry and timber processing, SW Vic, 2003/04 (no. of jobs) ^a

Sector	Final demand	Industrial support	Consumption induced	Total Impact	Proportion of total	Flow-on impacts	Proportion of flow-ons
Sheep	0	0	2	2	0.1%	2	0.2%
Grains	0	0	0	0	0.0%	0	0.0%
Beef	0	0	1	1	0.1%	1	0.1%
Dairy	0	0	1	1	0.1%	1	0.1%
OthLS	0	0	0	0	0.0%	0	0.0%
OthAg	0	5	2	7	0.5%	7	0.7%
ServAg	0	6	0	6	0.4%	6	0.6%
Forestry	112	103	0	215	15.4%	103	10.5%
Fishing	0	0	1	1	0.1%	1	0.1%
Mining	0	1	0	1	0.1%	1	0.1%
FoodPrd	0	0	4	4	0.3%	4	0.4%
Wine	0	0	0	1	0.0%	1	0.1%
WdPaper	295	1	0	297	21.3%	1	0.1%
OthMan	0	21	4	25	1.8%	25	2.6%
Utilities	0	3	3	6	0.4%	6	0.6%
BldgCon	0	9	2	12	0.8%	12	1.2%
Trade	0	211	133	344	24.6%	344	34.8%
AccmRest	0	12	37	49	3.5%	49	4.9%
Tport	0	170	8	178	12.8%	178	18.1%
Comm	0	5	5	10	0.7%	10	1.0%
Finance	0	11	11	23	1.6%	23	2.3%
ODwell	0	0	0	0	0.0%	0	0.0%
BusServ	0	73	16	88	6.3%	88	9.0%
PAdmin	0	9	3	12	0.8%	12	1.2%
Educn	0	6	23	29	2.1%	29	2.9%
Health	0	3	36	39	2.8%	39	4.0%
RecServ	0	2	11	13	1.0%	13	1.4%
PersServ	0	4	26	30	2.2%	30	3.0%
TOTAL	407	656	331	1,394	100.0%	987	100.0%
MULTIPLIER	1.0	1.6	0.8	3.4	-	2.4	-

^a Employment impacts are measured in terms of the number of full-time and part-time jobs.

Source: EconSearch analysis.

5.3.2 Total economic impact of primary industries, SW Vic, 2003/04

Estimates of the direct and indirect impact of forestry, timber processing, agriculture and the processing of agricultural products in the SW Vic region are provided in Table 5.8.

In aggregate, it is clear how important these primary industries are to the economy of SW Vic. In terms of contribution to GRP, forestry, timber processing, agriculture and the processing of agricultural products directly contributed 24 per cent of regional economic activity in 2003/04. This activity generated a further 20 per cent of GRP in flow-on effects, in total generating approximately 44 per cent of GRP. Total employment impacts were slightly more at 46 per cent of the regional total and the household income generated directly and indirectly by these primary industries comprised around 45 per cent of the regional total¹⁹.

¹⁹ Total household income in SW Vic in 2003/04 was estimated to be \$1.3 billion.

Table 5.8 The direct and indirect impact of primary industries, SW Vic, 2003/04 ^a

	Gross Value of Output ^b	Contribution to GRP	Employment	Household Income
	\$m	\$m	No. of jobs	\$m
Direct Impact of Primary Industries				
Sheep	322.0	163.0	3,308.0	68.0
Grains	27.0	14.0	234.0	5.0
Beef	174.0	89.0	1,492.0	30.0
Dairy	229.0	91.0	1,795.0	65.0
Other Livestock	2.0	0.0	24.0	0.0
Other Agriculture ^c	8.0	6.3	281.0	6.3
Forestry	54.2	15.9	215	11.5
Food Products	773.0	155.0	1,496.0	81.0
Wine	20.0	7.0	50.0	2.0
Wood and Paper Products	92.3	32.4	297	15.3
Total Direct Impact		573.7	9,192	284.2
Proportion of regional total		23.7%	23.8%	22.0%
Indirect Impact of Primary Industries				
Trade		102.1	3,178	82.9
Transport		50.7	832	33.1
Business Services		62.1	942	46.8
Finance		31.9	285	16.6
Other Manufacturing		14.5	176	7.2
Utilities		23.9	117	5.6
Accommodation, Restaurants and Cafes		15.7	513	10.3
Communications		15.7	153	7.2
Ownership of Dwellings		60.5	-	-
Other sectors		102.3	2,362	82.7
Total Indirect Impact		479.5	8,558	292.3
Proportion of regional total		19.8%	22.1%	22.6%
Total Direct plus Indirect Impact of Primary Industries		1,053.2	17,750	576.5
Proportion of regional total		43.6%	45.9%	44.6%

^a Primary industries include, for the purpose of this analysis, forestry, timber processing, agriculture and the processing of agricultural products.

^b Flow-on (indirect) and total output impacts are not reported as there are problems with double counting which can give a misleading impression of the significance of individual industries. For example, the value of saw logs processed locally is included in both the wood and paper products and forestry sectors. If the two values were added together the plantation-gate value of saw logs would be included twice.

^c Includes viticulture, horticulture and other agriculture.

Source: EconSearch analysis.

5.4 Economic Impacts in the Green Triangle Region

5.4.1 Economic impact of the timber industry in the Green Triangle region, 2003/04

Estimates of the economic impact of the forestry and timber processing industries in the Green Triangle regional economy are provided below in terms of contribution to GRP (Table 5.9) and employment (Table 5.10).

It is important to note that these estimates of economic impact are not a simple aggregation of the estimates for the component regions of SE SA and SW Vic. The broader Green Triangle regional economy is less reliant on imported goods and services than either SE SA or SW Vic because of the trade that occurs between these regions. Reduced expenditure on imported goods and services results in more local economic activity.

Estimates of the economic impact of the forestry and timber processing industries in the Green Triangle regional economy are provided below in terms of contribution to GRP (Table 5.9) and employment (Table 5.10).

- The direct contribution to GRP generated by the wood and paper products sector (from output valued at \$840 million) was around \$401 million in 2003/04 (Table 5.9).
- Associated with this was GRP in the forestry sector of over \$114 million (from output valued at \$214 million).
- The flow-on GRP to other sectors in the Green Triangle region summed to almost \$263 million.
- The flow-ons were greatest in the trade (\$53 million), transport (\$44 million), ownership of dwellings (\$40 million), business services (\$25 million), other manufacturing (\$14 million), utilities (\$13 million) and finance (\$13 million) sectors.
- Directly and indirectly, the timber industry (i.e. forestry and processing) contributed over \$778 million to GRP for the Green Triangle regional economy in 2003/04, approximately 16 per cent of the total.
- Direct employment generated by the wood and paper products sector was around 3,400 and in the forestry sector approximately 830 in 2003/04 (Table 5.10).
- Flow-on employment to other sectors in the region as a result of timber industry activity summed to almost 4,600 jobs.
- The flow-ons were greatest in the trade (1,660), transport (750), business services (430), other manufacturing (290) and accommodation, cafes and restaurants (240) sectors.
- Directly and indirectly, the timber industry (i.e. forestry and processing) generated almost 8,800 jobs in the Green Triangle region in 2003/04, approximately 12 per cent of the total.

Table 5.9 The direct and indirect GRP impacts of forestry and timber processing, Green Triangle region, 2003/04 (\$'000) ^a

Sector	Final demand	Industrial support	Consumption induced	Total Impact	Proportion of total	Flow-on impacts	Proportion of flow-ons
Sheep	0	848	740	1,588	0.2%	1,588	0.4%
Grains	0	26	175	202	0.0%	202	0.1%
Beef	0	111	1,308	1,419	0.2%	1,419	0.4%
Dairy	0	63	747	810	0.1%	810	0.2%
OthLS	0	6	78	85	0.0%	85	0.0%
OthAg	0	404	1,414	1,818	0.2%	1,818	0.5%
ServAg	0	661	175	836	0.1%	836	0.2%
Forestry	41,543	72,192	677	114,412	14.7%	72,869	19.3%
Fishing	0	91	596	686	0.1%	686	0.2%
Mining	0	1,251	297	1,547	0.2%	1,547	0.4%
FoodPrd	0	294	3,346	3,640	0.5%	3,640	1.0%
Wine	0	147	406	552	0.1%	552	0.1%
WdPaper	358,249	39,432	3,660	401,342	51.6%	43,093	11.4%
OthMan	0	11,082	2,419	13,501	1.7%	13,501	3.6%
Utilities	0	10,431	2,975	13,405	1.7%	13,405	3.5%
BldgCon	0	6,650	2,356	9,006	1.2%	9,006	2.4%
Trade	0	28,713	24,065	52,778	6.8%	52,778	13.9%
AccmRest	0	1,692	5,072	6,764	0.9%	6,764	1.8%
Tport	0	40,919	3,003	43,921	5.6%	43,921	11.6%
Comm	0	2,293	2,484	4,777	0.6%	4,777	1.3%
Finance	0	4,671	8,644	13,315	1.7%	13,315	3.5%
ODwell	0	0	39,228	39,228	5.0%	39,228	10.4%
BusServ	0	19,784	5,146	24,930	3.2%	24,930	6.6%
PAdmin	0	2,489	857	3,345	0.4%	3,345	0.9%
Educn	0	1,569	4,940	6,509	0.8%	6,509	1.7%
Health	0	672	7,325	7,997	1.0%	7,997	2.1%
RecServ	0	649	2,943	3,592	0.5%	3,592	0.9%
PersServ	0	862	5,460	6,322	0.8%	6,322	1.7%
TOTAL	399,792	248,000	130,536	778,328	100.0%	378,536	100.0%
MULTIPLIER	1.0	0.6	0.3	1.9	-	0.9	-

^a GRP impacts are a measure of contribution to gross regional product. Estimates are in 2003/04 dollars.

Source: EconSearch analysis.

Table 5.10 The direct and indirect employment impacts of forestry and timber processing, Green Triangle region, 2003/04 (no. of jobs) ^a

Sector	Final demand	Industrial support	Consumption induced	Total Impact	Proportion of total	Flow-on impacts	Proportion of flow-ons
Sheep	0	20	17	37	0.4%	37	0.7%
Grains	0	0	1	1	0.0%	1	0.0%
Beef	0	2	23	25	0.3%	25	0.5%
Dairy	0	1	16	17	0.2%	17	0.3%
OthLS	0	0	2	3	0.0%	3	0.0%
OthAg	0	8	16	25	0.3%	25	0.4%
ServAg	0	16	4	20	0.2%	20	0.4%
Forestry	274	550	5	829	9.5%	555	10.1%
Fishing	0	2	13	16	0.2%	16	0.3%
Mining	0	5	1	6	0.1%	6	0.1%
FoodPrd	0	5	54	58	0.7%	58	1.1%
Wine	0	1	3	4	0.0%	4	0.1%
WdPaper	2,997	327	30	3,354	38.3%	357	6.5%
OthMan	0	235	50	285	3.3%	285	5.2%
Utilities	0	59	16	75	0.9%	75	1.4%
BldgCon	0	78	29	106	1.2%	106	1.9%
Trade	0	900	755	1,655	18.9%	1,655	30.1%
AccmRest	0	59	176	235	2.7%	235	4.3%
Tport	0	697	51	748	8.5%	748	13.6%
Comm	0	26	28	54	0.6%	54	1.0%
Finance	0	42	78	120	1.4%	120	2.2%
ODwell	0	0	0	0	0.0%	0	0.0%
BusServ	0	340	88	427	4.9%	427	7.8%
PAdmin	0	45	16	61	0.7%	61	1.1%
Educn	0	38	121	159	1.8%	159	2.9%
Health	0	18	192	210	2.4%	210	3.8%
RecServ	0	12	55	67	0.8%	67	1.2%
PersServ	0	23	144	167	1.9%	167	3.0%
TOTAL	3,271	3,508	1,986	8,765	100.0%	5,495	100.0%
MULTIPLIER	1.0	1.1	0.6	2.7	-	1.7	-

^a Employment impacts are measured in terms of the number of full-time and part-time jobs.

Source: EconSearch analysis.

5.4.2 Total economic impact of primary industries, Green Triangle region, 2003/04

Estimates of the direct and indirect impact of forestry, timber processing, agriculture and the processing of agricultural products in the Green Triangle region are provided in Table 5.11. As above, note that these estimates of economic impact are not a simple aggregation of the estimates for the component regions of SE SA and SW Vic.

In aggregate, it is clear how significant these primary industries are to the economy of the Green Triangle region. In terms contribution to GRP, forestry, timber processing, agriculture and the processing of agricultural products directly contributed 34 per cent of regional economic activity in 2003/04. This activity generated a further 20 per cent of GRP in flow-on effects, in total generating approximately 54 per cent of GRP. Total employment impacts were slightly less at 53 per cent of the regional total and the household income generated directly and indirectly by these primary industries comprised around 51 per cent of the regional total²⁰.

²⁰ Total household income in the Green Triangle region in 2003/04 was estimated to be \$2.4 billion.

Table 5.11 The direct and indirect impact of primary industries, Green Triangle region, 2003/04 ^a

	Gross Value of Output ^b	Contribution to GRP	Employment	Household Income
	\$m	\$m	No. of jobs	\$m
Direct Impact of Primary Industries				
Sheep	507.1	268.0	5,805.5	104.2
Grains	155.9	82.4	566.4	10.4
Beef	327.5	177.8	3,095.5	54.1
Dairy	291.1	117.3	2,373.0	78.1
Other Livestock	11.2	2.1	86.0	1.3
Other Agriculture ^c	274.0	160.9	1,793.5	45.7
Forestry	213.8	114.4	828.8	40.6
Food Products	972.0	206.2	2,391.5	114.4
Wine	519.1	134.1	1,092.1	33.0
Wood and Paper Products	839.9	400.7	3,348.7	160.8
Total Direct Impact		1,664.0	21,381	642.4
Proportion of regional total		33.9%	29.4%	26.8%
Indirect Impact of Primary Industries				
Trade		208.1	6,508	166.2
Transport		103.5	1,743	73.6
Business Services		107.9	1,754	80.6
Finance		62.3	559	27.6
Other Manufacturing		36.8	670	23.0
Utilities		42.5	222	12.6
Accommodation, Restaurants and Cafes		34.1	1,167	22.3
Communications		26.9	285	13.3
Ownership of Dwellings		132.6	-	-
Other sectors		206.9	4,591	163.9
Total Indirect Impact		961.7	17,497	583.2
Proportion of regional total		19.6%	24.0%	24.3%
Total Direct plus Indirect Impact of Primary Industries		2,625.7	38,878	1,225.6
Proportion of regional total		53.5%	53.4%	51.1%

^a Primary industries include, for the purpose of this analysis, forestry, timber processing, agriculture and the processing of agricultural products.

^b Flow-on (indirect) and total output impacts are not reported as there are problems with double counting which can give a misleading impression of the significance of individual industries. For example, the value of saw logs processed locally is included in both the wood and paper products and forestry sectors. If the two values were added together the plantation-gate value of saw logs would be included twice.

Source: EconSearch analysis.

6. References

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Disclaimer

We have prepared the above report exclusively for the use and benefit of our client. Neither the firm nor any employee of the firm undertakes responsibility in any way whatsoever to any person (other than to the above mentioned client) in respect of the report including any errors or omissions therein however caused.

Appendix 1 Survey Covering Letter and Questionnaire

3 February 2005

«Title» «FirstName» «Surname»
«Company»
«Address1»
«Town» «Postcode»

Dear «Title» «Surname»

The Economic Impact of the Timber Industry in the Green Triangle Region

The Green Triangle Regional Plantations Committee has commissioned EconSearch Pty Ltd to undertake a study to assess the economic impact of the forest plantation and wood processing industries in South East South Australia and South West Victoria (i.e. the Green Triangle Region).

EconSearch undertook a similar study for the South East South Australia region in 2001 and the information has been a valuable tool for promoting the significance of the timber industry in the regional economy. In response to the development of substantial Blue Gum plantations in both South East South Australia and South West Victoria in recent years, the analysis is being updated and the scope widened to estimate the economic impact of the timber industry in the broader Green Triangle Region.

As part of the study, EconSearch is conducting a survey of firms involved in the forest plantation and wood processing industries in the Green Triangle Region. A short questionnaire is attached. The survey will provide information that is not available from published sources. It will enable EconSearch to estimate the regional impacts of the timber industry, both direct and flow-on effects, in terms of a range of indicators (e.g. employment, contribution to regional income, etc.).

In order to maintain the confidentiality of data from individual organisations, the final report will present results in aggregated forms only. All completed questionnaires will be held by EconSearch, treated in confidence and subsequently destroyed. The Green Triangle Regional Plantations Committee will not have access to, nor will they seek to obtain access to, the completed questionnaires.

A representative from EconSearch (Matthew Ferris) will contact you by phone shortly to ensure that you have received the questionnaire and to see if you require any assistance in interpreting it. In the meantime, if you have any queries with regard to the project or the questionnaire, please contact me on (08) 8273 1050 or Matthew Ferris at EconSearch on (08) 8357 9560.

I would be grateful if you would support this study by completing the attached questionnaire and returning it to EconSearch in the reply paid envelope by **14 February 2005**. The questionnaire can be provided in electronic form (via email), if preferred.

Yours sincerely,

John D. Kellas
Executive Officer



EconSearch Pty Ltd
 PO Box 746
 Unley Business Centre SA 5061
 Tel: 08 8357 9560
 Fax: 08 8357 2299
 Email:
matferris@econsearch.com.au
 Contact: Matthew Ferris or Julian
 Morison

CONFIDENTIAL

GREEN TRIANGLE TIMBER INDUSTRY ECONOMIC IMPACT STUDY

Please read this first:

- If exact figures are not available, please provide careful estimates.
- Please report all monetary values in **thousands of dollars** (\$'000).

1. Company Information

Company Name: _____

Timber industry activities (*e.g. plantation forestry and/or timber processing*):

Contact Name: _____

2. Employment

- a) Please indicate the number of employees and associated costs incurred in plantation forestry and/or timber processing activities by region: (*average for financial year 2003/04, including working proprietors, managers, directors*):

Employment	Region	
	South East South Australia	South West Victoria
Full time (no. jobs)		
Part time (no. full time equivalent jobs)		
Total wages and salaries (\$'000) (<i>including super, etc.</i>)		

- b) Please indicate the proportion of employment in:

a. plantation forestry and related activities (%) _____

b. timber processing and related activities (%) _____

- c) If your firm out-sources or contracts significant services that are integral to your day-to-day operations, could you please provide estimates of **employment** (in 2003/04) in those firms and the **nature of the goods and/or services provided** by those firms.
-
-

3. Other Costs

- a) Please indicate the magnitude of other costs incurred in the course of conducting your timber industry operations in 2003/04 (e.g. fuel, R&M, transport, contracted services) by region:

Expenditure (\$'000)	South East South Australia	South West Victoria
Saw logs		
Harvesting		
Fuel		
Repairs and maintenance		
Contracted services		
Transport		
Insurance		
Other		

- b) Please indicate the proportion of these costs incurred in:

a. plantation forestry and related activities (%) _____

b. timber processing and related activities (%) _____

4. Earnings

Please break down your timber industry related earnings by region and by broad category and estimate market share for each.

	South East South Australia		South West Victoria	
	Revenue, 2003/04 (\$'000)	Market share (%)	Revenue, 2003/04 (\$'000)	Market share (%)
Saw logs				
Woodchips				
Boards (MDF, LVL, etc)				
Paper, paper products, etc				
Other (please specify)				
TOTAL				

Thank you for your time and cooperation. Please return the questionnaire by **14 February 2005** in the reply paid envelope **OR** Fax: (08) 8357 2299.

If you have any queries don't hesitate to contact Matthew Ferris or Julian Morison on (08) 8357 9560 or matferris@econsearch.com.au.

Appendix 2 Glossary of Input-Output Terminology

Consumption-induced effects are additional output, employment and income resulting from re-spending by households that receive income from employment in direct and indirect activities. Consumption-induced effects are sometimes referred to as “induced effects”.

Contribution to gross state/regional product is calculated as the value of output less the cost of goods and services (including imports) used in producing the output. It represents payments to the primary inputs of production (labour, capital and land). Contribution to GSP/GRP is consistent with standard measures of economic activity, such as gross domestic, State or regional product and it provides an assessment of the net contribution to regional economic growth of a particular enterprise or activity.

Direct effects are the initial round of output, employment and income generated by an economic activity.

Employment is the number of working proprietors, managers, directors and other employees, in terms of the number of full-time equivalent jobs.

Flow-on effects are the sum of the production-induced effects and the consumption-induced effects.

Household income is wages and salaries and other payments to labour including overtime payments and income tax, but excluding payroll tax.

Input-output analysis is an accounting system of inter-industry transactions based on the notion that no industry exists in isolation.

Input-output table is a transactions table that illustrates and quantifies the purchases and sales of goods and services taking place in an economy at a given point in time. It provides a numerical picture of the size and shape of the economy and its essential features. Each item is shown as a purchase by one sector and a sale by another, thus constructing two sides of a double accounting schedule.

Multiplier is an index (ratio) indicating the overall change in the level of activity that results from an initial change in economic activity. They are an indication of the strength of the linkages between a particular sector and the rest of the regional economy. They can be used to estimate the impact of a change in that particular sector on the rest of the economy.

Other Final Demand includes government expenditure, private and public sector investment (gross fixed capital formation) and change in stocks (inventories).

Other Value Added includes gross operating surplus and all taxes, less subsidies.

Output is gross revenue of goods and services produced by commercial organisations plus gross expenditure by government agencies.

Production-induced effects are additional output, employment and income resulting from re-spending by firms that receive income from the sale of goods and services to firms undertaking, for example, agricultural activities. Production-induced effects are sometimes referred to as “indirect effects”.

Total impact is the sum of the direct effects and the flow-on effects.

Type I multiplier is calculated as (direct effects + production-induced effects)/direct effects.

Type II multiplier is calculated as (direct effects + production-induced effects + consumption-induced effects)/direct effects.

Appendix 3 Input-Output Methodology

Overview of Input-Output Analysis

Input-output analysis provides a comprehensive economic framework that is extremely useful in the resource planning process. Broadly, there are two ways in which the input-output method can be used.

First, the input-output table provides a numerical picture of the size and shape of the economy and its essential features. The input-output transactions table can be used to describe some of the important features of an economy, the interrelationships between sectors, and the relative importance of the individual sectors.

Second, input-output analysis provides a standard approach for the estimation of the economic impact of a particular activity. The input-output model is used to calculate industry multipliers that can then be applied to various development scenarios.

Linkages between sectors

The standard approach for the estimation of the regional economic impact of a particular activity, such as timber production, is to employ *input-output analysis*. The input-output model conceives the economy of the region as being divided up into a number of sectors, and this allows the analyst to trace expenditure flows.

To illustrate this, consider the example of a timber mill that, in the course of its operation, purchases goods and services from other sectors. These goods and services would include saw logs, machinery repairs and maintenance services and, of course, labour. The direct employment created is regarded in the model as an expenditure flow into the household sector, which is one of several non-industrial sectors recognised in the input-output model.

Upon receiving expenditure by the timber mill, the other sectors in the state economy engage in their own expenditures. For example, as a consequence of winning a contract for work with a timber mill, a machinery maintenance firm buys materials from its suppliers and labour from its own employees. Suppliers and employees in turn engage in further expenditure, and so on. These *indirect effects*, as they are called, are part of the impact of the timber mill on the regional or state economy. They must be added to the *direct effects* (which are expenditures made in immediate support of the timber mill itself) in order to arrive at a measure of the total impact of the timber mill.

It may be thought that these indirect effects go on indefinitely, and that their amount adds up without limit, the presence of *leakages*, however, prevents this from occurring. In the context of the impact on a *regional or state* economy, an important leakage is expenditure on imports, that is, products or services that originate from *outside the region, state or country* (e.g. milling machinery).

Thus some of the expenditure for imports to the region is lost to the local economy. Consequently, the indirect effects get smaller and smaller in successive expenditure rounds, due to this and other leakages. Hence the total expenditure created in the local economy is limited in amount, and so (in principle) it can be measured.

The performance of the input-output analysis calculations require a great deal of information. The analyst needs to know the magnitude of various expenditures and where they occur. Also needed is information on how the sectors that receiving this expenditure share *their* expenditures among the various sectors from whom they buy, and so on for the further expenditure rounds.

In applying the input-output model, the standard procedure is to determine the direct or first-round expenditures only. No attempt is made to pursue such inquiries on expenditure in subsequent rounds, not even (for example) to trace the effects in the local economy on household expenditures by timber mill employees on food, clothing, entertainment, and so on, as it is impracticable to measure these effects for an individual case, here the timber mill.

The input-output model is instead based on a set of assumptions about constant and uniform proportions of expenditure. If households in general in the local economy spend (say) 13.3 per cent of their income on food and non-alcoholic beverages, it is assumed that those working in timber mills do likewise. Indeed, the effects of all expenditure rounds after the first are calculated by using such standard proportions (*multiplier* calculations).

Multipliers

Multipliers are an indication of the strength of the linkages between a particular sector and the rest of the regional economy. As well, they can be used to estimate the impact of a change in that particular sector on the rest of the economy. As noted above, detailed explanations on calculating input-output multipliers (and the underlying assumptions) are provided in any regional economics or input-output analysis textbook (see for example Jensen and West (1986)). Suffice to note that they are calculated through a routine set of mathematical operations based on coefficients derived from the input-output transactions table.

Input-output transactions table

The structure and linkages of a local economy can be described with the aid of input-output analysis. Input-output analysis, as an accounting system of inter-industry transactions, is based on the notion that no industry exists in isolation.

This assumes, within any economy, each firm depends on the existence of other firms to purchase inputs from, or sell products to, for further processing. The firms also depend on final consumers of the product and labour inputs to production. An input-output transactions table is a convenient way to illustrate the purchases and sales of goods and services taking place in an economy at a given time.

Input-output tables provide a numerical picture of the size and shape of the economy and its essential features. Products produced in the economy are aggregated into a number of groups of industries and the transactions between them recorded in the transactions table. The rows and columns of the input-output table can be interpreted in the following way:

- The rows of the input-output table illustrate sales for intermediate usage (to other firms) and for final demand (consumers, exports, capital formation).
- The columns show the origin of the inputs and hence the purchases made at that time (labour, capital and intermediate inputs).

- Each item is shown as a purchase by one sector and a sale by another, thus constructing two sides of a double accounting schedule.

In summary, the input-output transactions table can be used to describe some of the important features of a regional economy, the interrelationships between sectors, and the relative importance of the individual sectors. The table is also used for the calculation of sector multipliers and the estimation of economic impacts arising from some change in the local economy.