Economic survey of log processing facilities in the South East region of Queensland

ABARE report to the
Department of Primary Industries and Energy
to fulfil the requirements of Project SE 2.2
for the Comprehensive Regional Assessment
of the forests of South East Queensland

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July 1998

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Project objective

The objective of Comprehensive Regional Assessment (CRA) Project SE 2.2 (Log Processing Survey) for the South East Queensland Regional Forest Agreement (RFA) is to provide economic data on the log processing industry in South East Queensland to serve as inputs into subsequent modelling projects, in particular Project SE 2.4 (FORUM model).

It should be noted that this report is only a summary of the key economic data collected from Project SE 2.2 and as such is not a complete presentation of all the data supplied. It should also be noted that in order to provide a summary of the data, individual data components had to be significantly aggregated. Data used in subsequent modelling projects will use the confidential data disaggregated to the processor level.

Unless otherwise indicated, the results in this report relate only to those processors who source whole logs for their processing operations.

Acknowledgments

Tim Bull and Allan Hansard were responsible for the management of the survey and preparation of this report. Yvette Glen assisted in the drafting and QT Tran provided technical assistance. Tim Bull, Phil Sledge and Carly Gilmour conducted the face to face surveys with the mill owners/managers. The authors would like to thank the many sawmillers, and in particular the Queensland Timber Board, for their help in providing the Queensland information for this report.

1. Introduction

As part of the comprehensive regional analysis to support the development of a Regional Forest Agreement (RFA) for South East Queensland, ABARE conducted an economic survey of log processors that used hardwood and softwood logs harvested within the region in 1995-96.

Respondents were asked to provide financial and technical details of their log processing operations for the 1995-96 financial year. Hardwood and softwood log processing were treated separately, with the following data being collected: public and private log throughput; total log throughput; raw wood materials; recovery, by log grade; mill door prices and production; sales, by market; freight costs and delivery; and average unit cost on operations. Information relating to mill and labour costs was also provided, in addition to overall financial profiles of each processor.

In all, 46 processors (hardwood and softwood) were surveyed from a population of 125 processors holding Queensland Department of Primary Industries sawmill licences in financial year 1995-96. Details of the survey method are outlined in appendix A.

Information derived from the survey has been used to estimate key variables, including the total gross and economic value of the hardwood and softwood log processing industry, the size and scale of the log processing facilities, log throughput, mill employment and the types of products produced in the South East Queensland RFA region. The method used to derive these estimates is outlined in appendix B.

In order to honour the conditions of the data confidentiality agreements established between ABARE and the individual log processors, not all survey data collected are presented in this report. Confidential data are aggregated to prevent access to individual operator data.

2. Hardwood log processing industry

Background

According to Queensland Department of Primary Industries licence records, 98 processors received hardwood logs from the forests of the South East Queensland RFA region in 1995-96. All of these processors were sawmills except for the hardboard plant at Bundamba. This mill sources the majority of its inputs from sawmill residues and has been excluded from this report for confidentiality reasons.

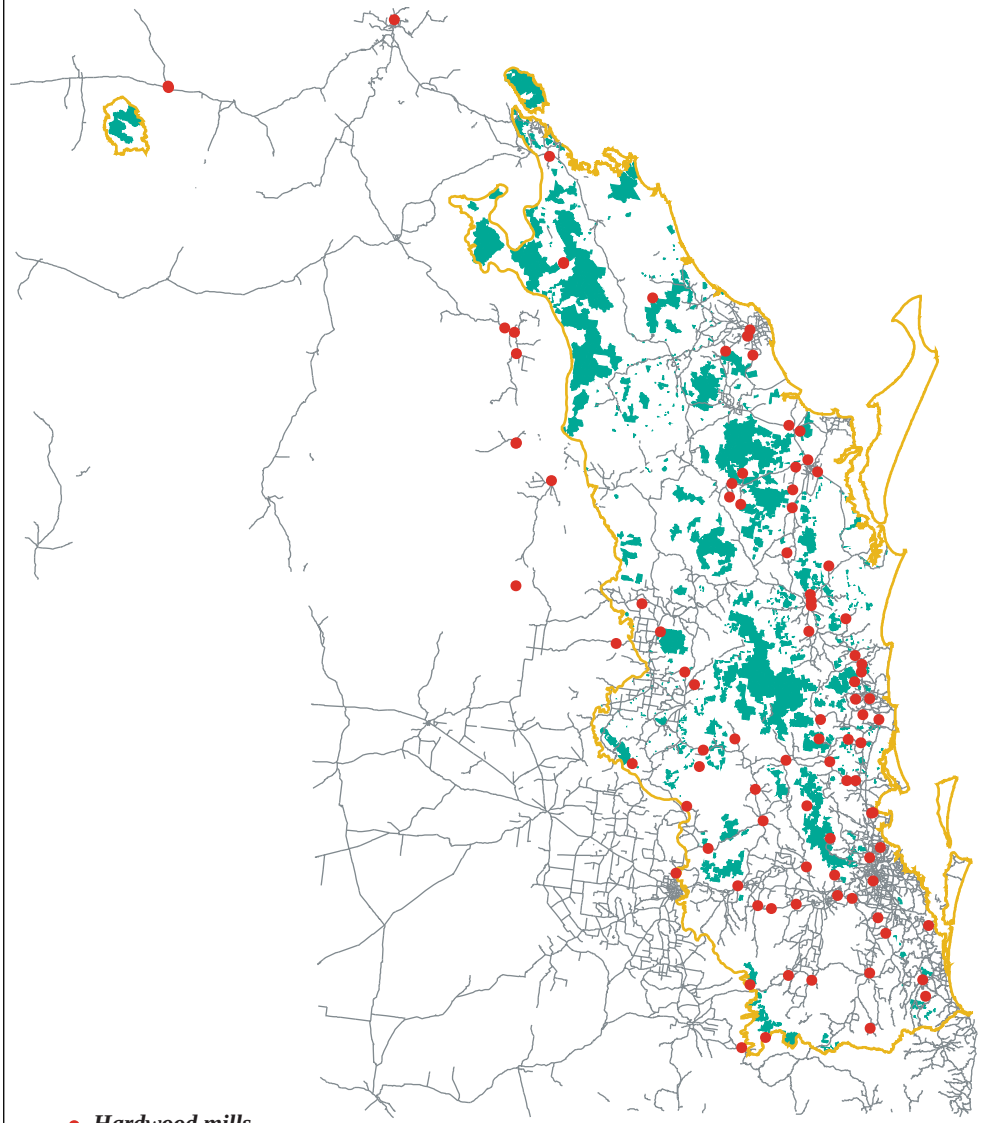
The hardwood sawmills are distributed widely through the South East Queensland RFA region, and are particularly clustered around the large processing centres of Maryborough, Gympie, Sunshine Coast and Brisbane (figure A). There are also some hardwood sawmills located outside the South East Queensland RFA boundary (Monto, Eidsvold, Mundubbera, Dingo and Rockhampton) that sourced some of their logs from within the region in 1995-96. These sawmills are hereafter referred to as 'the additional South East Queensland sawmills'. All data presented includes data from 'the additional South East Queensland sawmills' unless specified otherwise.

Log throughput

Just over 339 000 cubic metres of hardwood logs were processed by sawmills in the South East Queensland RFA region in 1995-96. Around 128 000 cubic metres of this volume was sourced from public forests, with the balance (211 000 cubic metres) sourced from private forests (figure B). Respondents indicated that the private logs included a higher proportion of salvage logs than the public component. These figures include around 17 200 cubic metres of logs sourced from public forests outside of the South East Queensland RFA region and 24 400 cubic metres of logs sourced from private forests outside of the South East Queensland RFA region by the 'the additional South East Queensland sawmills'.

Log throughput and capacity of hardwood sawmills in the South East Queensland RFA region are presented in table 1. The hardwood sawmills have been divided into four categories

A ***South East Queensland RFA hardwood sawmill locations***

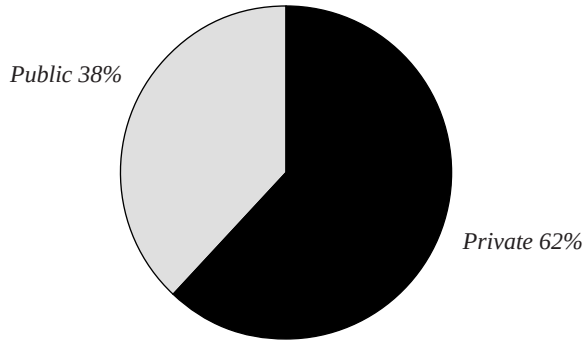


- ***category 1 mills*** – sawmills with an annual throughput less than 1000 cubic metres
- ***category 2 mills*** – sawmills with an annual throughput of 1000–5000 cubic metres
- ***category 3 mills*** – sawmills with an annual throughput of 5000–10 000 cubic metres and
- ***category 4 mills*** – sawmills with an annual throughput greater than 10 000 cubic metres.

The hardwood sawmilling industry is characterised by a large number of small sawmills each using a small portion of the harvested resource. Almost half of the sawmills (category 1 mills) in the region used only 5 per cent of the total logs harvested, whereas the largest mills (category 4 mills) used 47 per cent of these logs (table 1).

The hardwood sawmills also indicated that, given their current operation assumptions (such as existing milling equipment), in aggregate they could process a further 99 100 cubic metres of hardwood logs a year. Category 1 mills were operating well below capacity and indicated that they could process three times as many logs as they did in 1995–96. This is partly attributable to many of these sawmills being part time operations, but with owners wanting to operate full time. Category 4 mills were operating much closer to capacity, possibly reflecting more extensive contractual arrangements with private landowners.

B ***Source of hardwood log throughput for South East Queensland mills***



Most survey respondents indicated that their log throughput contained a mix of species. Over 60 per cent of surveyed sawmills indicated that the major species processed were spotted gum and ironbarks. About 90 per cent of sawmills that sourced their logs north of Maryborough indicated that spotted gum and ironbark were their major species. For mills south of Maryborough this proportion fell to 45 per cent, with these mills also processing significant quantities of blackbutt, grey box and brushbox. Mills located west of the Great Dividing Range processed primarily spotted gum, ironbarks, stringybarks and grey box.

Table 1: Hardwood log throughput and throughput capacity, South East Queensland RFA, by mill category [a]

	Unit	Category 1	Category 2	Category 3	Category 4	Total
Total log throughput						
Average [b]	'000 m^3	0.33 (68)	2.5 (12)	7.1 (2)	17.8 (5)	
Total [c]	'000 m^3	15.4	71.5	91.9	160.3	339.1
Share of total	%	5	21	27	47	
Throughput capacity						
Average [b]	'000 m^3	1.0 (28)	2.9 (11)	7.5 (2)	23.1 (9)	
Total [c]	'000 m^3	47.6	85.2	97.3	208.1	438.2
Share of total	%	12	19	22	47	

a Preliminary estimates based on log processing survey. **b** Average of surveyed log processors. **c** Total for all South East Queensland RFA mills.
Note: Figures in parentheses are relative standard errors, expressed as percentages of the estimates. Totals may not add due to a rounding effect. Shares are expressed across all mill categories.
Definitions:
Category 1 mills — annual throughput less than 1000 cubic metres.
Category 2 mills — annual throughput of between 1000–5000 cubic metres.
Category 3 mills — annual throughput of 5000–10 000 cubic metres.
Category 4 mills — annual throughput greater than 10 000 cubic metres.

Products

Hardwood sawmills in the South East Queensland RFA produced a wide range of wood products in 1995-96, ranging from green offsawn boards to high value decorative mouldings. These products have been classified into two major categories: unseasoned sawntimber and seasoned sawntimber. Roundwood has also been included for hardwood sawmills which also produced poles and piles (table 2).

Over 90 per cent of the products produced by hardwood sawmills were unseasoned (primarily construction/framing, fencing and green offsawn boards), with only a small portion of product being seasoned (primarily flooring/decking and structural) (figure C). Of the seasoned product, only 1 per cent was produced by category 1 mills (table 2), demonstrating their low involvement in value adding to produce seasoned product. While pole and pile collectors were excluded from this survey (appendix A), some hardwood sawmills also produced small quantities of roundwood (table 2).

Seasoned products had a higher mill exit price (excluding delivery costs) than the unseasoned products, with prices averaging around $600 per cubic metre (with some speciality products receiving prices as high as $1100 per cubic metre) compared with an average of around $460 for unseasoned sawn products. It is important to note that these prices include inter-company transfers.

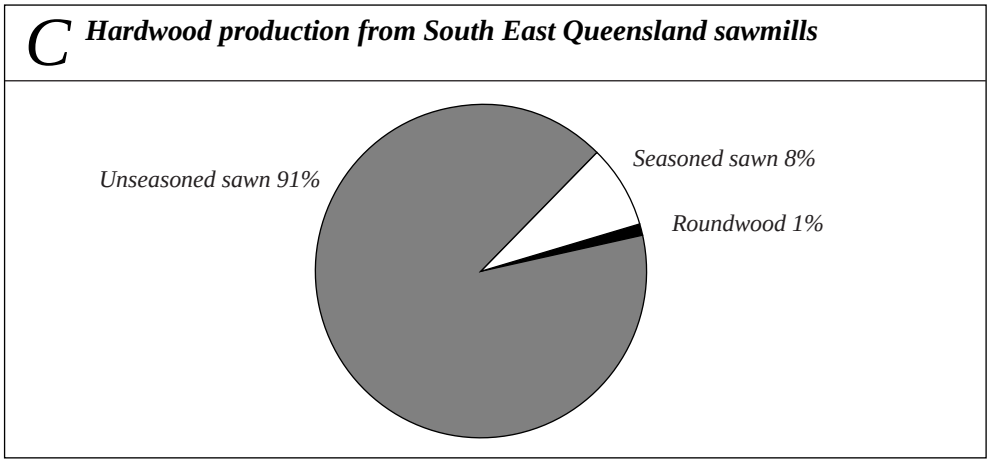


Table 2: Hardwood production of sawntimber products, South East Queensland RFA, by mill category [a]

	Category 1			Category 2			
	Average [b]	**Total [c]**	**Share**	**Average [b]**	**Total [c]**	**Share**	
	'000 m^3	'000 m^3	%	'000 m^3	'000 m^3	%	
Roundwood	0	0.0	0	0.004 (85)	0.1	19	
Seasoned sawntimber	0.1 (47)	6.9	5	1.0 (11)	30.2	23	
Unseasoned sawntimber	0.002	0.1	1	0.1 (67)	2.8	25	
	Category 3			**Category 4**			
	Average [b]	**Total [c]**	**Share**	**Average [b]**	**Total [c]**	**Share**	**Total**
	'000 m^3	'000 m^3	%	'000 m^3	'000 m^3	%	'000 m^3
Roundwood	0	0.0	0	0.06 (34)	0.5	71	0.7
Seasoned sawntimber	2.4 (4)	30.8	24	6.8 (5)	61.6	48	129.5
Unseasoned sawntimber	0.3 (22)	4.2	37	0.5 (16)	4.4	38	11.6

a Preliminary estimates based on log processing survey. **b** Average of surveyed log processors. **c** Total for all SEQ RFA mills.
Note: Figures in parentheses are relative standard errors, expressed as percentages of the estimates. Totals may not add due to a rounding effect. Shares are expressed across all mill categories.
Definitions:
Category 1 mills — annual throughput less than 1000 cubic metres.
Category 2 mills — annual throughput of between 1000–5000 cubic metres.
Category 3 mills — annual throughput of 5000–10 000 cubic metres.
Category 4 mills — annual throughput greater than 10 000 cubic metres.

There were over 180 000 cubic metres of residues produced as by-product from the hardwood sawmilling industry in the South East Queensland RFA region in 1995-96. Residues included sawdust, landscaping fines and chips. Mill owners indicated that there were very limited markets for these products, with most sawmills either burning their residues (usually as waste disposal and not as fuel) or having them taken away to landfill. Some sawmills managed to supply landscaping markets with chips and fines. The prices received for these products barely recovered the costs involved in marketing them.

The average product recovery rate for the hardwood sawmills in the South East Queensland RFA region in 1995-96 was around 40 per cent. There was a clear relationship between the size of the sawmill and product recovery rate, with the larger mills having a lower product recovery rate than the smaller mills. The lower recovery rate for the larger mills can be explained by many of the category 4 mills cutting 'oversize' for input into further value adding plants. The higher recovery rates

for the smaller sawmills can also be explained by their ability to use a larger proportion of each log by using labour intensive milling techniques.

Financial profile

Almost $4 million was invested by hardwood sawmills in 1995-96 in new plant and equipment. Mill size, product mix and the degree of value adding are strongly related to the amount of capital investment in the mill. Category 1 mills invested very little in new plant and equipment (only 2 per cent of the total) in 1995-96 (table 3). Although reporting on investment in any one year may not be representative of long term investment trends, owners of most mills indicated that they had refrained from purchasing new plant and equipment in recent years because of the increasing gap between their capacity and actual log throughput, and their lack of resource security.

Very few mills had kiln drying facilities, but a significant number of mills had treatment facilities for the spotted gum resource. This reflects the product markets that the mills were producing for — the unseasoned construction and framing market requires that the product is appropriately treated to comply with the *State Timber Utilisation and Marketing Act 1987*. It also reflects the high cost of kiln drying facilities.

Table 3: Financial profile of hardwood mills, South East Queensland RFA, by mill category [a]

Category 1					**Category 2**			
	Unit	**Average b**	**Total c**	**Share**	**Average b**	**Total c**	**Share**	
				%			%	
Expenditure on plant and equipment	$'000	1.4 (79)	64	2	6.8 (85)	198	5	
Total mill door costs	$/m3	69 (8)	na	na	69 (4)	na	na	
Processing costs	$/m3	98 (11)	na	na	77 (10)	na	na	
Total mill operating costs	$'000	71.7 (53)	3 253.9	6	347.2 (18)	10 067.7	18	
Category 3					**Category 4**			
	Unit	**Average b**	**Total c**	**Share**	**Average b**	**Total c**	**Share**	**Total**
				%			%	
Expenditure on plant and equipment	$'000	195.1 (34)	2 536.7	64	126.5 (10)	1138.1	29	3 937.1
Total mill door costs	$/m3	72 (5)	na	na	58.9 (5)	na	na	na
Processing costs	$/m3	77 (5)	na	na	60 (5)	na	na	na
Total mill operating costs	$'000	1 455.0 (3)	18196.2	32	2 746.3 (3)	24 7156.5	44	56 235.8

a Preliminary estimates based on log processing survey. **b** Average of surveyed log processors. **c** Total for all South East Queensland RFA mills. **na** Not available.
Note: Figures in parentheses are relative standard errors, expressed as percentages of the estimates. Totals may not add due to a rounding effect. Shares are expressed across all mill categories.
Definitions:
Category 1 mills — annual throughput less than 1000 cubic metres.
Category 2 mills — annual throughput of between 1000–5000 cubic metres.
Category 3 mills — annual throughput of 5000–10 000 cubic metres.
Category 4 mills — annual throughput greater than 10 000 cubic metres.

For category 1, 2 and 3 mills, the mill door cost (the sum of royalties, falling and transport from forest to mill) per cubic metre of log (all logs processed by the mill are included in these averages — that is, sawlog and salvage log) was estimated at between $69 and $72, while for category 4 mills it was estimated at $59 (table 3). This cost differential reflected transport costs and royalty charges. Some category 4 mill managers indicated that they were able to purchase logs at a lower cost from private forests through long term arrangements with private landowners close to their mill. Other category 4 mill managers indicated that prices for private logs were higher because of fierce competition. In contrast, a number of category 1, 2 and 3 mill owners indicated that they could only obtain logs from private forests relatively distant from their mill.

Category 4 mills also had lower average processing costs per unit of log equivalent [labor salaries + materials (including fuel, excluding wood costs) + repairs and maintenance] than the other mills. For example, category 4 mills could process a cubic metre of log equivalent 38 per cent cheaper than category 1 mills (table 3). Category 4 mills also had smaller repair and maintenance cost ratios than the other mills — reflecting that category 4 mills had newer machinery than category 1, 2 and 3 mills.

Total mill operating costs [total labor costs + total wood costs + materials (including fuel) + administration + repairs and maintenance + depreciation on plant and machinery + interest payments] for the South East Queensland RFA hardwood sawmilling industry were estimated to total $56 million.

The average gross wage (not including superannuation and workers compensation insurance) for a hardwood mill worker in the South East Queensland RFA region in 1995-96 was $23 500 (table 4). A mill worker was defined as anyone working in the mill (including office and management staff), and excluded those employed in the harvesting and transport sectors. ‘On-costs’ such as superannuation and workers compensation were as high as 35 per cent of the gross wage.

Table 4: Average wage for hardwood mill workers, South East Queensland RFA, by mill category **a**

	Category 1	**Category 2**	**Category 3**	**Category 4**	**Total c**
	$	$	$	$	$
Average **b**	21 600 (19)	22 600 (5)	25 700 (2)	28 000 (1)	23 500 (5)

a Preliminary estimates based on log processing survey. **b** Average of surveyed log processors. **c** Total for all South East Queensland RFA mills.
Note: Figures in parentheses are relative standard errors, expressed as percentages of the estimates. Totals may not add due to a rounding effect. Shares are expressed across all mill categories.
Definitions:
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Category 2 mills — annual throughput of between 1000–5000 cubic metres.
Category 3 mills — annual throughput of 5000–10 000 cubic metres.
Category 4 mills — annual throughput greater than 10 000 cubic metres.

There was a clear relationship between size of mill and wage paid. Category 4 mills paid their workers, on average, 29 per cent more than category 1 mills. This is a reflection of the significant number of family run / part time operations among the category 1 mills.

Table 5: Economic contribution of hardwood mills, South East Queensland RFA, by mill category a

	Category 1				Category 2			
	Unit	**Average b**	**Total c**	**Share**	**Average b**	**Total c**	**Share**	
				%			%	
Gross value of production	$'000	84.2 (52)	3872.3	6	484.1(12)	14 040.3	20	
Market value of mill plant and equipment	$'000	46.6 (64)	2 41.1	4	399.4 (29)	11 582.8	21	
Market value of mill land	$'000	46.7 (60)	2 147.4	22	77.4 (27)	2 245.5	23	
Employment	No.	2 (18)	106	14	7 (12)	200	26	
	Category 3				**Category 4**			
	Unit	**Average b**	**Total c**	**Share**	**Average b**	**Total c**	**Share**	**Total**
				%			%	
Gross value of production	$'000	1 524.6 (3)	19 819.8	29	3 424.9 (5)	30 824.0	45	68 556.3
Market value of mill plant and equipment	$'000	2 002.1 (26)	26 027.4	47	1 753.3 (14)	15 779.4	28	55 530.6
Market value of mill land	$'000	190.5 (18)	2 476.3	25	323.8 (18)	2 913.6	30	9 782.7
Employment	No.	16 (5)	209	27	28 (4)	251	33	675

a Preliminary estimates based on log processing survey. **b** Average of surveyed log processors. **c** Total for all South East Queensland RFA mills.
Note: Figures in parentheses are relative standard errors, expressed as percentages of the estimates. Totals may not add due to a rounding effect. Shares are expressed across all mill categories.
Definitions:
Category 1 mills — annual throughput less than 1000 cubic metres.
Category 2 mills — annual throughput of between 1000–5000 cubic metres.
Category 3 mills — annual throughput of 5000–10 000 cubic metres.
Category 4 mills — annual throughput greater than 10 000 cubic metres.

The estimated market value of all the mill plant and equipment in the South East Queensland RFA region in 1995-96 totalled $55.5 million (table 5). It is estimated that there were 765 mill workers in the South East Queensland RFA hardwood sawmilling industry in 1995-96. Category 1 mills employed 14 per cent of the mill workforce, despite taking only 5 per cent of the harvested resource (table 1) reflecting the more labour intensive nature of their operations (table 5).

The gross value of production for the South East Queensland hardwood sawmilling industry in 1995-96 was around $68.6 million (table 5). The gross value of production is calculated by multiplying mill door price by the volume of product across the range of products. The average gross value of production for category 1 mills was about $84 000 a year, compared with category 4 mills which averaged around $3.4 million a year.

The gross operating surplus of mills in the South East Queensland RFA region in 1995-96 was calculated by subtracting mill operating costs (excluding capital costs) from gross value of production. The total for the South East Queensland hardwood sawmilling industry was estimated at around $12 million (table 6). Category 1 and 4 mills had gross operating surplus in line with their share of the resource (tables 1 and 6). However, category 2 mills had a higher ratio of gross operating surplus to throughput than other mills, reflecting their relatively low operating costs.

Table 6: Gross operating surplus for hardwood mills, South East Queensland RFA, by mill category **a**

	Unit	Category 1	Category 2	Category 3	Category 4	Total c
Average **b**	$'000	13.4 (70)	137.0 (47)	124.8 (14)	678.6 (14)	127.0 (17)
Total **c**	$'000	618.4	3 972.6	1 622.1	6 107.5	12 320.5
Share of total	%	5	32	13	50	

a Preliminary estimates based on log processing survey. **b** Average of surveyed log processors. **c** Total for all South East Queensland RFA mills.
Note: Figures in parentheses are relative standard errors, expressed as percentages of the estimates. Totals may not add due to a rounding effect. Shares are expressed across all mill categories.
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Category 4 mills — annual throughput greater than 10 000 cubic metres.

3. Softwood log processing industry

Background

The survey of softwood processors in the South East Queensland RFA region included mills producing sawnwood products as well as other processors producing panel products. To meet data confidentiality requirements (there is only a small number of panel processors in the South East Queensland RFA region), the results for the wood based panel industry have been included with sawmills (only those wood based panel producers sourcing a percentage of their input from whole logs are included in this report). However, where appropriate, the tabulated results for wood based panel and sawntimber data are shown separately.

The majority of the softwood log processors were located along the coastal strip between Maryborough in the north and Brisbane in the south (figure D). The majority of these log processors utilised exotic pines with some (30 per cent) also processing native hoop pine and 10 per cent, radiata pine.

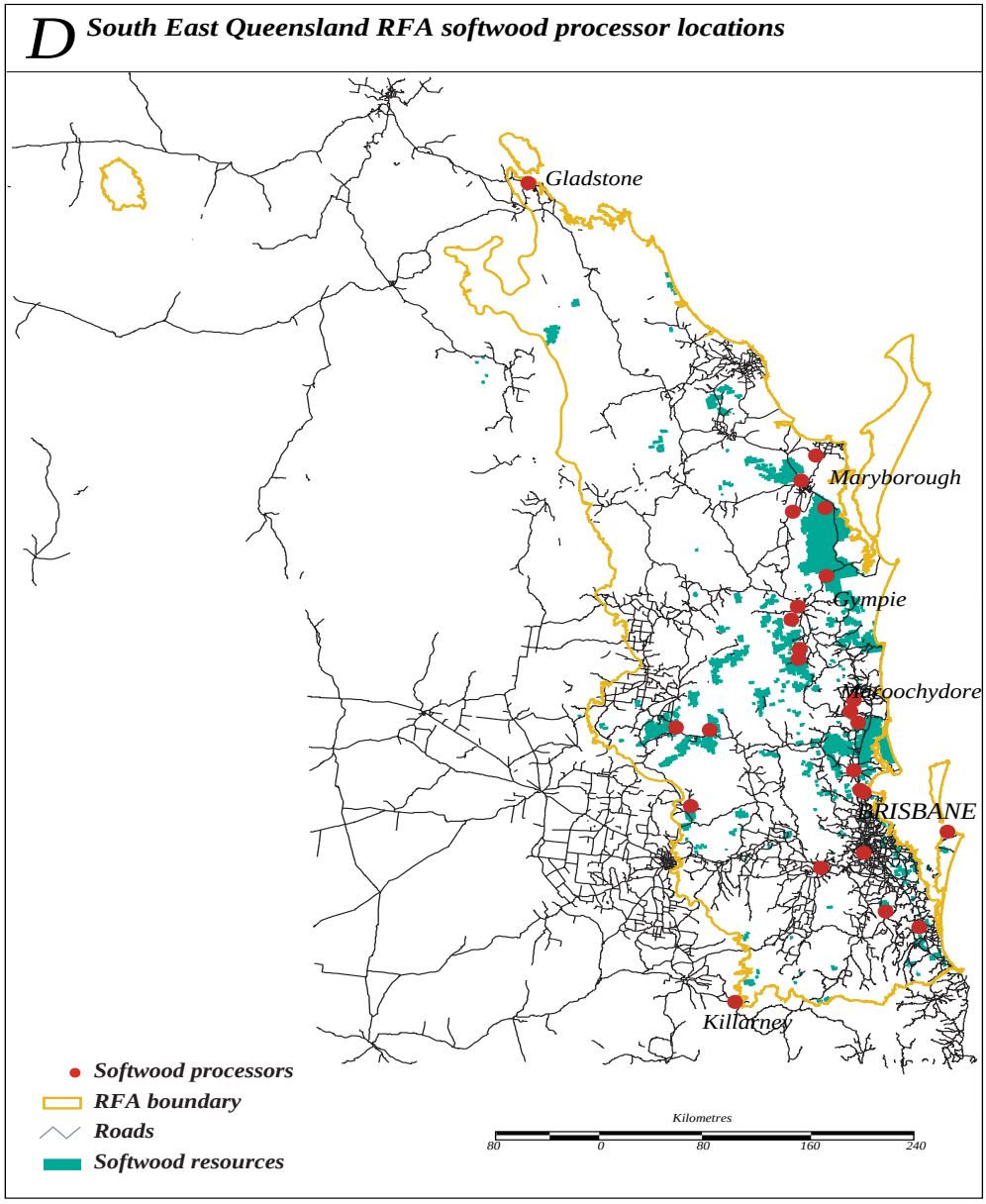
There were also a number of softwood processors located outside the South East Queensland RFA boundary, for example Killarney, that sourced some of their logs from within the region in 1995-96. As the number of these processors is small, in order to meet the conditions of the confidentiality agreements established between ABARE and these processors, all data presented includes data from these processors.

Log throughput

About 1.5 million cubic metres of softwood logs were processed by the wood processing mills in the South East Queensland RFA region in 1995-96 (table 7).

The softwood processors have been divided into three categories:

- ***category 1 processors*** — annual throughput less than 10 000 cubic metres;
- ***category 2 processors*** — annual throughput of between 10 000 and 50 000 cubic metres; and
- ***category 3 processors*** — annual throughput greater than 50 000 cubic metres.



Within the South East Queensland RFA region there were many small scale processors that individually process an insignificant proportion of total industry log throughput. These category 1 processors, representing 30 per cent of all softwood processors in the South East Queensland RFA region, processed only 3 per cent of the total log throughput for the region. Category 2 processors, which represented just under half the number of processors (44 per cent) in the region, processed around 19 per cent of the total log throughput in the region. In contrast, category 3 processors represented only 26 per cent of the total number of processors but accounted for 78 per cent of the volume of log throughput (table 7).

Table 7: Softwood log throughput, South East Queensland RFA, by mill category [a]

	Category 1	Category 2	Category 3	Total c
Average **b**	6.1 (20)	23.7 (14)	176.8 (13)	57.0 (10)
Total **c**	48.8	284.1	1 193.5	1 526.3
Share of total (%)	3.2	18.6	78.2	

a Preliminary estimates based on log processing survey. **b** Average of surveyed log processors. **c** Total for all South East Queensland RFA mills.
Note: Figures in parentheses are relative standard errors, expressed as percentages of the estimates. Totals may not add due to a rounding effect. Shares are expressed across all mill categories.
Definitions:
Category 1 mills — annual throughput less than 10 000 cubic metres.
Category 2 mills — annual throughput of between 10 000–50 000 cubic metres.
Category 3 mills — annual throughput greater than 50 000 cubic metres.

Products

Almost 725 000 cubic metres of softwood products were produced from processors of whole logs in 1995-96. There were substantial differences in the timber products produced by processors of different sizes (table 8). Category 1 processors did not produce any roundwood products and tended to produce more unseasoned than seasoned timber. Category 2 processors were the main producers of roundwood timber, producing similar proportions of seasoned and unseasoned timber. Category 3 processors tended to produce higher value timber products, producing slightly less unseasoned than seasoned timber. Category 3 processors also included the processors of wood based panels.

The wood based panel processors constituted the largest share (43 per cent of total volume) of softwood products produced in the region from whole logs (figure E). However, it is important to note that the production of wood based panel in South East Queensland was actually higher than 300 000 cubic metres as some wood based panel processors also used a proportion of the 680 000 cubic metres of softwood residues produced in the South East Queensland RFA region.

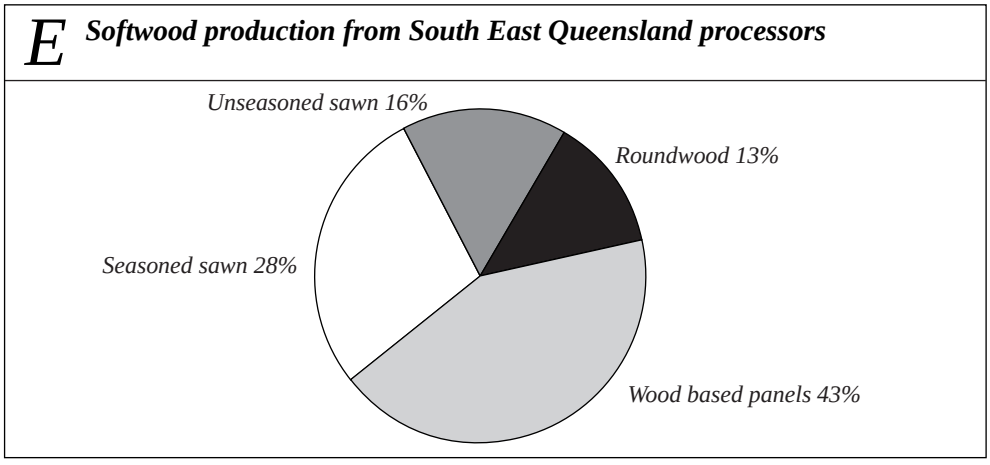
All softwood processing categories in the South East Queensland RFA region were operating below their maximum capacity (assuming current processing equipment) (table 9). Category 1 processors operated at an average of 73 per cent of production capacity. Category 2 processors averaged 68 per cent capacity utilisation and category 3 processors operated at an average of only 54 per cent of their production capacity. The large difference between current production and total capacity for category 3 processors reflects the ability of these processors to operate for several shifts a day.

Table 8: Production volumes of softwood products, South East Queensland RFA, by mill category a

	Category 1			Category 2		
	Average b	**Total c**	**Share**	**Average b**	**Total c**	**Share**
	'000 m^3	'000 m^3	%	'000 m^3	'000 m^3	%
Roundwood	0	0.0	0	5.4 (41)	65.3	69
Unseasoned sawntimber	1.0 (63)	8.0	7	2.0 (36)	24.5	21
Seasoned sawntimber	0.5 (60)	3.6	2	4.0 (30)	48.5	24
Wood based panels	1.1 (63)	8.7	3	0	0.0	0
Residues	3.1 (20)	25.1	4	10.8 (20)	129.5	19

	Category 3			
	Average b	**Total c**	**Share**	**Total**
	'000 m^3	'000 m^3	%	
Roundwood	4.3 (85)	29.2	31	94.5
Unseasoned sawntimber	12.3 (89)	82.7	72	115.2
Seasoned sawntimber	22.8 (85)	153.7	75	205.8
Wood based panels	44.4 (66)	300.0	97	308.7
Residues	77.7 (52)	524.5	77	679.1

a Preliminary estimates based on log processing survey. **b** Average of surveyed log processors. **c** Total for all South East Queensland RFA mills.
Note: Figures in parentheses are relative standard errors, expressed as percentages of the estimates. Totals may not add due to a rounding effect. Shares are expressed across all mill categories.
Definitions:
Category 1 mills — annual throughput less than 10 000 cubic metres.
Category 2 mills — annual throughput of between 10 000–50 000 cubic metres.
Category 3 mills — annual throughput greater than 50 000 cubic metres.



There is an apparent positive relationship between recovery rate and log throughput, with log recovery increasing as throughput increases. The average recovery rate for all softwood mills in the South East Queensland RFA region was 47 per cent (this includes the wood based panel mills, many of which have a recovery rate of greater than 70 per cent).

Table 9: Maximum annual softwood productive capacity, South East Queensland RFA, by mill category a

	Unit	Category 1	Category 2	Category 3	Total
Average b	'000 m^3	3.5 (19)	17.0 (19)	155.0 (30)	47.8 (24)
Total c	'000 m^3	27.7	204.5	1 046.5	1 278.8
Share of total	%	2	16	82	

a Preliminary estimates based on log processing survey. **b** Average of surveyed log processors. **c** Total for all South East Queensland RFA mills.
Note: Figures in parentheses are relative standard errors, expressed as percentages of the estimates. Totals may not add due to a rounding effect. Shares are expressed across all mill categories.
Definitions:
Category 1 mills — annual throughput less than 10 000 cubic metres.
Category 2 mills — annual throughput of between 10 000–50 000 cubic metres.
Category 3 mills — annual throughput greater than 50 000 cubic metres.

Financial profile

In 1995-96 about $8 million was invested by softwood processors in new plant and equipment (table 10). The level of investment in new plant and equipment is in line with share of processor throughput (table 7).

The per unit log equivalent processing costs [labour salaries + materials (including fuel, excluding wood costs) + repairs and maintenance] were found to decrease with an increase in throughput capacity. For example, category 3 processors processed a cubic metre of product 30 per cent cheaper than category 1 processors (table 10). The average mill door cost for sawlogs (averaged across exotic and native softwoods) was $66 per cubic metre.

Table 10: Financial profile of softwood mills, South East Queensland RFA, by mill category a

	Category 1				Category 2		
	Unit	Average b	Total c	Share	Average b	Total c	Share
				%			%
Expenditure on plant and equipment	$'000	55.7 (52)	445.6	0	102.4 (34)	1 229.1	15
Processing costs	$/$m^3$	96 (27)	634.0	33	79 (9)	942.6	49
Mill operating costs	$'000	474.0 (28)	3 792.1	3	3 582.7 (16)	42 992.8	31

	Category 3				
	Unit	Average b	Total c	Share	Total
				%	
Expenditure on plant and equipment	$'000	1 048.6 (85)	7 078.0	85	8 307.6
Processing costs	$/$m^3$	68 (1)	339.0	18	1.9
Mill operating costs	$'000	13 781.5 (28)	93 024.8	67	139 809.7

a Preliminary estimates based on log processing survey. **b** Average of surveyed log processors. **c** Total for all South East Queensland RFA mills.
Note: Figures in parentheses are relative standard errors, expressed as percentages of the estimates. Totals may not add due to a rounding effect. Shares are expressed across all mill categories.
Definitions:
Category 1 mills — annual throughput less than 10 000 cubic metres.
Category 2 mills — annual throughput of between 10 000–50 000 cubic metres.
Category 3 mills — annual throughput greater than 50 000 cubic metres.

The gross value of production for the softwood processing industry in 1995-96 was almost $210 million (table 11).

The softwood processing industry employed an estimated 1100 mill workers in 1995-96. The average wage was $25 000 (full time equivalent). Category 1 processors employed an average of 21 mill workers where as category 3 processors employed an average of 67 full time workers (table 11). Category 1 processors employed 15 per cent of employees associated with softwood processing (table 11) in the South East Queensland RFA region, despite only taking 3 per cent of the harvested resource. Category 3 processors were more capital intensive — they took 78 per cent of the logs and employed 41 per cent of the employees, reflecting the capital intensive nature of their operations.

Table 11: Economic contribution of softwood mills, South East Queensland RFA, by mill category [a]

	Category 1				Category 2		
	Unit	**Average** [b]	**Total** [c]	**Share**	**Average** [b]	**Total** [c]	**Share**
				%			%
Gross value of production	$'000	1 634.5 (36)	13 076.1	6	3 971.5 (16)	47 657.8	23
Market value of mill plant and equipment	$'000	1 311.2 (28)	10 489.8	8	4 696.4 (28)	56 356.6	44
Market value of mill land	$'000	316.4 (38)	2 531.1	26	172.5 (33)	2 070.1	21
Employment	no.	21 (37)	168	15	40 (8)	476	43

	Category 3				
	Unit	**Average** [b]	**Total** [c]	**Share**	**Total**
				%	
Gross value of production	$'000	21 716.8 (85)	146 588.0	71	207 322.0
Market value of mill plant and equipment	$'000	8 995.9 (76)	60 722.1	48	127 568.4
Market value of mill land	$'000	785.8 (69)	5 304.0	54	9 905.3
Employment	no.	67 (81)	456	41	1 100

a Preliminary estimates based on log processing survey. **b** Average of surveyed log processors. **c** Total for all South East Queensland RFA mills.
Note: Figures in parentheses are relative standard errors, expressed as percentages of the estimates. Totals may not add due to a rounding effect. Shares are expressed across all mill categories.
Definitions:
Category 1 mills — annual throughput less than 10 000 cubic metres.
Category 2 mills — annual throughput of between 10 000–50 000 cubic metres.
Category 3 mills — annual throughput greater than 50 000 cubic metres.

Table 12: Gross operating surplus for softwood mills, South East Queensland RFA, by mill category [a]

	Unit	Category 1	Category 2	Category 3	Total [c]
Average [b]	$'000	1 160.5 (60)	388.7 (20)	7 935.3 (80)	2 523.8 (98)
Total [c]	$'000	9 284.1	4 665.0	53 563.2	67 512.3
Share of total	$'000	14	7	79	

a Preliminary estimates based on log processing survey. **b** Average of surveyed log processors. **c** Total for all South East Queensland RFA mills.
Note: Figures in parentheses are relative standard errors, expressed as percentages of the estimates. Totals may not add due to a rounding effect. Shares are expressed across all mill categories.
Definitions:
Category 1 mills — annual throughput less than 10 000 cubic metres.
Category 2 mills — annual throughput of between 10 000–50 000 cubic metres.
Category 3 mills — annual throughput greater than 50 000 cubic metres.

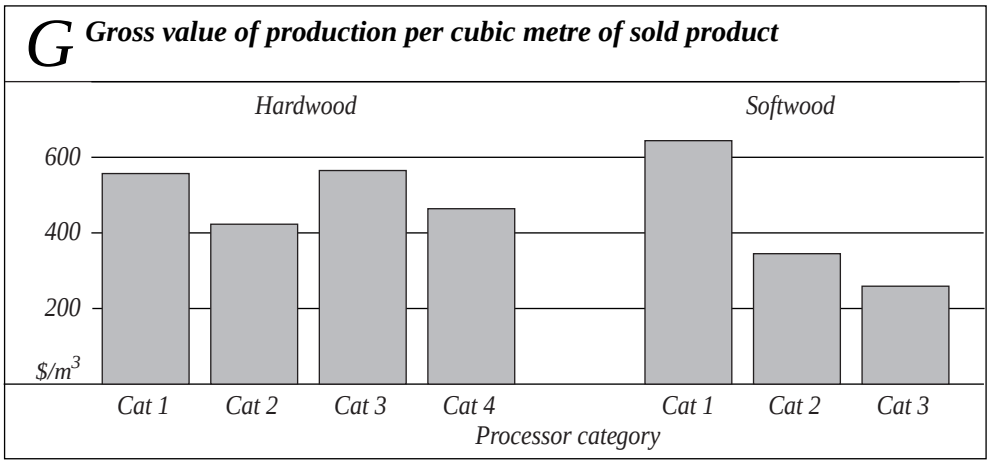
The gross operating surplus is calculated by subtracting operating costs (excluding capital costs) from the gross value of production. In 1995-96, the gross operating surplus for the South East Queensland softwood milling industry was estimated at around $67 million (table 12).

4. Summary

The first-round processors in the South East Queensland RFA region produced a wide range of hardwood and softwood products. By volume, wood based panels represented 37 per cent of production; softwood seasoned sawntimber 23 per cent of production; and unseasoned hardwood sawntimber 15 per cent (figure F).

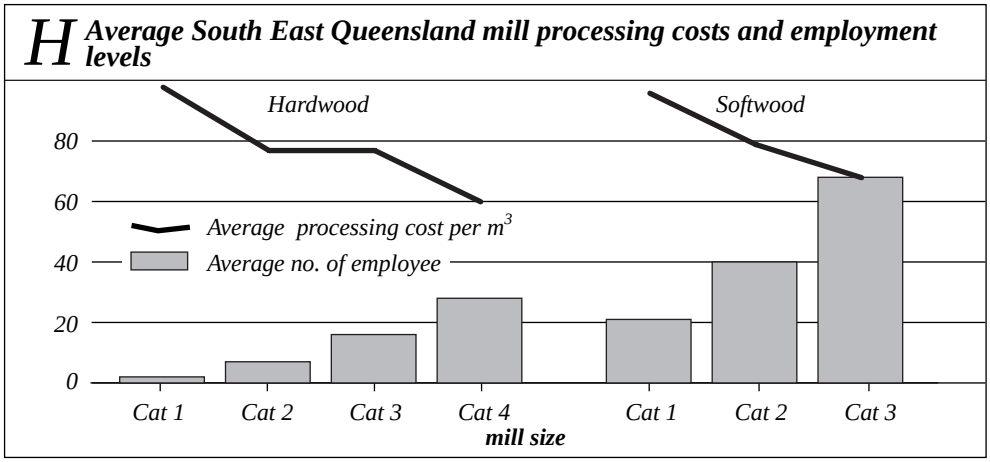
The majority of categories 1, 2 and 3 hardwood mills produced unseasoned products, while the larger category 4 hardwood mills produced both unseasoned products and higher valued seasoned. As many of the category 4 mills produced significant quantities of low value green sawntimber along with high value green sawntimber to be used as inputs at further processing centres, their average gross value of production per unit of sold output was a similar level to the other mill categories (figure G).

In softwood processing this relationship was reversed. Category 1 and 2 processors produced high percentages of seasoned product while the larger, category 3, processors produced high volumes of unseasoned product and wood based panel and residues. When comparing the hardwood and softwood gross value of production per unit of output sold (figure G), it is important to note that only the softwood processors (in particular category 3 in large volumes) were able to sell significant volumes of relatively low valued residues to further processors. This reduces the average gross value of production figures for these mills.

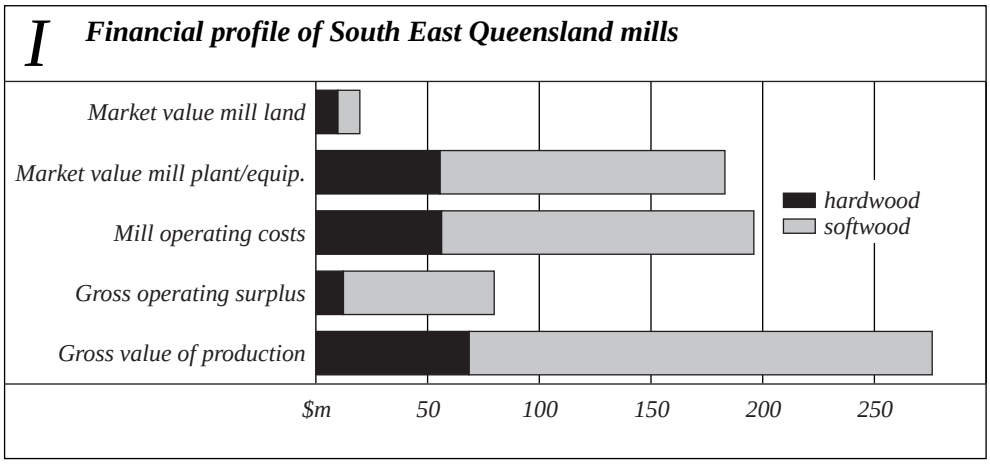


It was also found that the relationship between recovery rate (into sawntimber) and size of mill was reversed between hardwood and softwood processors. For hardwood sawmills, it was the smaller sawmills (categories 1 and 2) which were relatively labour intensive and which had the higher recovery rates. For softwood processors, while the smaller (categories 1 and 2) processors were labour intensive, they had the lower recovery rates. This is because these processors primarily produced sawntimber, while the larger, category 3, processors also produced wood based panels, which use more of each log.

Both the hardwood and softwood processors of the South East Queensland RFA exhibited decreasing per unit processing costs as mill scale increased (figure H). However, low capacity utilisation was evident for small hardwood mills (categories 1 and 2) and large processors (category 3) of softwood and this would be expected to increase unit costs.



Based on 1995-96 data the softwood log processing industry was around three times the size of the hardwood log processing industry in terms of the gross value of product (figure I).



Appendix A: Survey method

The survey of wood processing mills in South East Queensland was conducted by ABARE field survey officers over a four week period in August and September 1997. The survey involved face to face interviews with mill owners or managers of hardwood sawmills, softwood sawmills and wood panel plants. The survey data were collected for the 1995-96 financial year.

Reflecting the large number of mills using resources from the South East Queensland RFA region, a representative sample of mills was contacted as part of the survey. The sample mills were stratified on the basis of size (based on throughput), type (softwood or hardwood), forest allocation zone and source (public or private). A breakdown of the number and type of mills surveyed is presented in table 13.

Table 13: Mills surveyed

Type of mill	Sample	Population
	No.	No.
Hardwood	31	97
Softwood	15	27
Total	46	124

A small number of the hardwood sawmills received small quantities of softwood logs from the region, but as the softwood contributed insignificantly to these sawmills' log throughput, these sawmills were classified as hardwood. The owners of these sawmills indicated that, because of the different technical and machinery requirements to produce softwood and hardwood sawntimber, it was not economical for them cut substantial quantities of both.

The population of sawmills includes all those sawmills that source logs from within the South East Queensland RFA region, even if the mills are geographically located out of the region. Those mills that do not process raw logs are not classified as mills for the purpose of this survey report. Such mills have been classified as further processors of wood and were surveyed separately by ABARE. The hardboard plant at Bundamba was the only mill that sourced both a significant percentage of its input from raw logs and from residues and was also the only mill that produced hardboard — it has been excluded from this report for confidentiality reasons.

Mobile sawmills, pole and pile collectors were not included as part of this survey for logistical reasons. QDPI Forestry advises that compared to the fixed sawmills, that their total contribution to the industry in South East Queensland is insignificant.

Appendix B: Deriving total estimates for the log processing industry

Hardwood

ABARE surveyed 31 of the 97 hardwood sawmills receiving logs from the South East Queensland RFA region. Total estimates for the South East Queensland hardwood sawmilling industry were derived by weighting the survey respondents. The population of sawmills receiving logs from the region was stratified into four groups based on their throughput (including any throughput from outside of the South East Queensland region). The size categories are given in table 14.

Table 14: Classification of hardwood mills

Category	Log throughput	Population	Survey responses
	m^3	no.	no.
Category 1	≤ 1000	46	5
Category 2	> 1000 ≤ 5000	29	8
Category 3	> 5000 ≤ 10000	13	10
Category 4	> 10000	9	8

Softwood

Of the 27 processors sourcing plantation logs from within the South East Queensland RFA region, 15 softwood processors were surveyed. Total estimates for the South East Queensland softwood processing industry were derived by weighting the survey respondents. The population of processors receiving logs from the South East Queensland region was stratified into three groups based on their log throughput (including any throughput from outside of the South East Queensland region). The size classes are given in table 15.

Table 15: Classification of hardwood mills

Category	Log throughput	Population	Survey responses
	m^3	no.	no.
Category 1	≤ 10000	8	5
Category 2	> 10000 ≤ 50000	12	7
Category 3	> 50000	7	3

Weights (for both hardwood and softwood) calculated on both the processor population and estimated throughput of the processors on a stratum basis, were applied to the survey results to estimate key variables for the total industry.

Some processor managers supplied only partial responses to the questionnaires. In these cases, estimates calculated from average costs, prices and returns were used.

Results for the South East Queensland wood processing industry are supplied with a relative standard error. To obtain the standard error of the estimate from the relative standard error, multiply the relative standard error by the survey estimate and divide by 100. There is roughly a two in three chance that the survey error is within one standard error of the value that would have been obtained from the total population and a 19 in 20 chance of it being within two standard errors.