

STUDY OF SUPPLY  
AND DEMAND OF  
INDUSTRIAL ROUNDWOOD  
in South Africa



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# Study of Supply and Demand of Industrial Roundwood in South Africa

Period 2005 to 2034

**January 2005**

**Disclaimer : Although the information is presented in good faith and believed to be correct, the Department of Water Affairs and Forestry makes no representations or warranties as to the completeness or accuracy of the information and makes no commitment to update or correct information. Opinions expressed do not necessarily reflect the views of DWAF.**



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1. Reports on Commercial Timber Resources and Primary Roundwood Processing in South Africa 1991 – 2002
2. Forestry Guide Plan for South Africa 1982
3. Strategic Forestry Development Plan 1989
4. Supply and Demand Study of Softwood Sawlog and Sawn Timber 2004 - CA
5. Roundwood Supply and Demand to 2030 – LHA
6. National Forestry Action Plan
7. Lumber Index – Crickmay & Associates (Pty) Ltd.
8. Forestry South Africa – various reports
9. Studies done on Forestry in Australia, Chile and New Zealand – M Smith
10. Reports on Treated Poles – SAWPA
11. SADC Forestry Reports – CA
12. Sundry Sawmilling and Processing reports – CA

## ABBREVIATIONS

a.s.l.	Above sea level
CA	Crickmay & Associates (Pty) Ltd.
CIT	Chipboard Industries (Transkei) (Pty) Ltd.
COMPAS	Computerised Plantation Analysis System
CSIR	Council for Scientific and Industrial Research
CTC	The Central Timber Co-op Ltd.
DBSA	Development Bank of South Africa
DWAF	Department of Water Affairs and Forestry
EIA	Environmental Impact Assessment
FES	Forestry Economics Services
FSA	Forestry South Africa
FSC	Forestry Stewardship Council
ISO	International Standards Organisation
LCM	Low Cost Sawmills
LHA	Louis Heyl & Associates
LPI	Lumber Price Index
MAI	Mean Annual Increment
MDF	Medium Density Fibreboard
MMRC	Mensuration and Modelling Research Consortium
MTO	Mountain to Ocean Forestry
NFAP	National Forestry Action Plan
NCT	NCT Forestry Co-operative Ltd.
SABS	South African Bureau of Standards
SADC	Southern African Developing Countries
SAFCOL	South African Forestry Company Limited
SALMA	South African Lumber Miller's Association
SANS	South African National Standards
SAWGU	South African Wattle Growers Union
SAWPA	South African Wood Preservers Association
Tons	In the text means metric tonnes
TWK	Transvaal Wattle Kweekers (Kooperasie) Bpk, since 1999 TWK Landbou Beperk

## DEFINITIONS

### Mean Annual Increment

The average annual growth of a given plantation harvested over a full rotation for a given area. In this case, one hectare. Expressed in this report as tons per hectare per annum because the bulk of the harvest is sold in tons rather than in cubic meters.

### Harvest

The total utilisable volume or tonnage removed, i.e. harvested.

### Sustainable Yield

The volume or tonnage that can be harvested on an ongoing basis without diminishing the resource.

### All Roundwood

Refers to industrial roundwood prior to conversion and includes sawlogs, pulpwood, poles, mining timber, firewood and roundwood used for the manufacture of charcoal, etc.

### Domestic Roundwood

Timber derived from non commercial plantations which is used for building and fencing poles and for firewood of which firewood is the greatest and has been stated to comprise 40% to 50% of all roundwood used. Domestic roundwood is not included in this study.

### Wattle Jungle

Refers to self generated uneven aged and unthinned plantations which are frequently harvested for specific roundwood types.

### Timber Industry

Comprises the growing and conversion of industrial roundwood forest products.

### Projections

These are arithmetic projections based on known data.

### Forecasts

Are projections which have been adjusted to take account of uncertainties.

# 1. BACKGROUND AND TERMS OF REFERENCE

Following a recently published supply and demand study on softwood sawlogs in South Africa, it was considered that a similar study for roundwood other than sawlogs should be developed. This study was commissioned by the Department of Water Affairs and Forestry and has been undertaken by Crickmay & Associates (Pty) Ltd.

It is important to note that this report addresses only the industrial and not the domestic use of timber, e.g. hut poles, firewood, etc., which has been estimated by the CSIR to be approximately equal to 40% to 50% of all roundwood used.

Furthermore, this report focuses on roundwood other than sawlogs but does incorporate the results of the sawlog study in Sections 9 and 10.

The object of the study is to establish the supply and demand on regional and national levels with the following Terms of Reference:

- Project the demand for industrial roundwood and chips for pulp and board plants, taking into account the demand for mining timber, treated poles, charcoal and related products.
- Project fibre availability by genus and by region for overall industry planning and marketing.
- Avoid the question of ownership of the resource.
- Provide through quantifying supply and demand a means of communication between the forest industry and the Government to facilitate development and protection of the industry.
- Facilitate easy updating of supply and demand data and accommodate improved input in the future.
- Provide updated standard norms of conversion of volume to mass.
- Provide generally achieved Mean Annual Increment figures by genus and region.

The window period runs from 2005 to 2034.

The measure used throughout this study is metric tons other than the section dealing specifically with sawlogs where the measure is cubic meters.

## 1.1 ACKNOWLEDGEMENTS

This study has been compiled by Crickmay & Associates in a team comprising of D G Crickmay, J Le Brasseur, Prof J A Stubbings and A E Daugherty.

Messrs Edwards and Godsmark of Forestry South Africa have assisted with their comments, as have Dr Diek van der Zel and many others from growers, timber co-operatives, sawmillers, pulp and paper, particle board, mining timber manufacturers and pole treaters.

Reference is made to the Forestry Guide Plan for South Africa 1982, the Strategic Forestry Development Plan for South Africa 1989 and the Supply and Demand Study of Softwood Sawlog and Sawn Timber 2004.

Forest Economics Services were most helpful in providing information.

In finalising this report Louis Heyl & Associates' projections prepared for DWAF were checked against the forecasts and projections contained herein. Our forecast and the end of LHA's 30-year window period were remarkably close, although derived from completely different methodology.

Constructive comments submitted by DWAF in an assessment of the draft study have been incorporated in the final report.

Forestry South Africa have given their formal approval of this report.

## 2. EXECUTIVE SUMMARY

### 2.1 CONCLUSION

This study concludes that the existing plantation resource is insufficient to supply current markets and the shortage becomes more serious with time. The shortage is alleviated to some extent in the initial ten years by the accelerated harvesting of over-age Eucalypt plantations. The sustainable annual harvest amounts to 13.5 million tons while the demand is 17.3 million tons (excluding sawlogs). If Pine and Eucalypt sawlogs are included then the annual demand increases to 23.0 million tons but the sustainable harvest is 19.8 million tons.

If an allowance is made for growth of 3%, the demand increases to 31.9 million tons resulting in a shortfall of 12.6 million tons at the end of the window period. A further 785,275 hectares of new plantings will be required to make up the shortfall.

The shortfall for domestic processing could be alleviated if necessary and profitable to do so, by substituting the 5.1 million tons of chips being exported annually for local processing.

- 2.2 The primary source of information for the study is the latest report on Commercial Timber Resources and Primary Roundwood Processing in South Africa 2001/2002 (Para 4.0).
- 2.3 Updated information on roundwood volume : mass ratios for different periods of air drying is provided (Appendix E) as well as Mean Annual Increments generally achieved by genus and region (Appendices F).
- 2.4 In projecting demand, current usage and known expansion to local downstream processing have been included (Para 7.4) as well as different scenarios of expected real growth and possible interchanging of roundwood between sectors (Para 10.3).
- 2.5 In projecting supply and current total plantation area of 1,399,241 ha is used (Table 9, Para 4.8), yield regulation is based on rotation age/area (Para 4.1) and allowances are made for the following:
- Projections of tree growth from 2002 to base year 2005 (Para 4.1).
  - Simulated clearfelling areas (Para 4.2 and 4.5).
  - Phasing out of Pine sawlog areas (Para 4.3).
  - Area allowance for implementing environmental standards (Para 4.4, Table 31).
  - Area allowance for delays in re-establishment (Para 4.6).
  - Volume allowance for fire losses (Paras 4.7 and 10.2).
- 2.6 A summary of the supply and demand over the window period of 2005 to 2034 in five year averages is summarised as follows:

TABLE 1: Analysis of Supply and Demand: 2005 – 2034: All Genera including sawlogs prior to any growth scenarios

FIVE YEAR PERIOD	TOTAL SUPPLY (tons)	TOTAL DEMAND (tons)	SURPLUS (+) / SHORTFALL (-)	
			(tons)	(%)
2005 – 2009	20,550,761	23,249,214	-2,698,453	-13.1
2010 – 2014	20,087,199	23,932,910	-3,845,711	-19.1
2015 – 2019	18,609,931	24,650,053	-6,040,122	-32.5
2020 – 2024	19,454,356	25,448,516	-5,994,160	-30.8
2025 – 2029	18,666,332	26,372,899	-7,706,567	-41.3
2030 – 2034	18,134,701	27,501,409	-9,366,708	-51.7
<b>Estimated sustainable supply:</b>	<b>19,250,547</b>	<b>25,192,500</b>	<b>-5,941,953</b>	<b>-23.2</b>

(Table 28)

- 2.7 In 2005, South Africa will use 23.5 millions tons of timber including sawlogs and waste, which is made up as follows (Para 7.3, Table 21 and Appendices C):

*TABLE 2: South Africa's Timber Usage (tons)*

2005	'000s Tons
Roundwood	17,238
Waste and chips	688
Imports	271
Softwood sawlog	5,070
Eucalypt sawlog	184
<b>TOTAL</b>	<b>23,451</b>

- 2.8 South Africa has 73,000 ha of Eucalypts in excess of ten years of age. These have been assumed to be felled over the first nine years in this forecast and has contributed to suppressing the shortage prior to 2013 (Para 5.1, Table 11).
- 2.9 The supply and demand by genus from 2005 to 2034 show that supplies of Pine pulpwood are almost in balance but there is a serious shortage of Eucalypt and Wattle pulpwood (Section 8).

*TABLE 3: Analysis of Supply and Demand: 2005 – 2034: Pine (excluding sawlogs)*

FIVE YEAR PERIOD	TOTAL SUPPLY (tons)	TOTAL DEMAND (tons)	SURPLUS (+) / SHORTFALL (-)	
			(tons)	(%)
2005 – 2009	4,576,051	3,266,000	1,310,051	40%
2010 – 2014	4,225,485	3,242,000	983,485	30%
2015 – 2019	3,116,840	3,242,000	-125,160	-4%
2020 – 2024	3,197,740	3,242,000	-44,260	-1%
2025 – 2029	4,441,426	3,242,000	1,199,426	37%
2030 – 2034	3,372,768	3,242,000	130,768	4%
<b>Estimated sustainable supply:</b>	<b>3,821,700</b>			

*TABLE 4: Analysis of Supply and Demand: 2005 – 2034: Eucalypt (excluding sawlogs)*

FIVE YEAR PERIOD	TOTAL SUPPLY (tons)	TOTAL DEMAND (tons)	SURPLUS (+) / SHORTFALL (-)	
			(tons)	(%)
2005 – 2009	9,963,574	12,272,400	-2,308,826	-19%
2010 – 2014	9,376,974	12,340,000	-2,963,026	-24%
2015 – 2019	8,050,747	12,340,000	-4,289,253	-35%
2020 – 2024	8,597,568	12,340,000	-3,742,432	-30%
2025 – 2029	7,143,001	12,340,000	-5,196,999	-42%
2030 – 2034	8,728,321	12,340,000	-3,611,679	-29%
<b>Estimated sustainable supply:</b>	<b>8,643,400</b>			

TABLE 5: Analysis of Supply and Demand: 2005 – 2034: Wattle (excluding sawlogs)

FIVE YEAR PERIOD	TOTAL SUPPLY (tons)	TOTAL DEMAND (tons)	SURPLUS (+) / SHORTFALL (-)	
			(tons)	(%)
2005 – 2009	1,252,124	1,643,000	-390,876	-24%
2010 – 2014	941,921	1,623,000	-681,079	-42%
2015 – 2019	1,203,738	1,623,000	-419,262	-26%
2020 – 2024	886,027	1,623,000	-736,973	-45%
2025 – 2029	1,147,182	1,623,000	-475,818	-29%
2030 – 2034	840,782	1,623,000	-782,218	-48%
<b>Estimated sustainable supply:</b>	<b>1,045,300</b>			

2.10 Plantation expansion rate has slowed dramatically and reasons and suggested corrective actions are given in Paragraphs 5.5 and 5.6.

## 2.11 COMMENT AND RECOMMENDATIONS

The forest industry is important:

- Employing 129,160 people directly (516,640 including dependants);
- Contributing R18.7 billion per annum to the GDP;
- Second only to coal in exports;
- Contributing 9.7% to agricultural GDP;
- Is internationally highly accredited environmentally and is therefore a strong candidate for accreditation of the benefits of carbon sequestration.

**If the timber supply is unable to meet demand and South Africa has to resort to cutting production or importing either roundwood chips or manufactured products, e.g. sawn timber, there will be a substantial loss of jobs and revenue. On the other hand, if the industry can establish a further 785,275 ha it will provide direct employment for 72,300 people and benefit the country to the tune of R10.4 billion.**

In compiling this report certain serious problems confronting the timber industry became clear and in our view need to be addressed. These include the following:

- The release of land on this scale will need the help of Government.
- Continue improving vigour and productivity of the trees.
- Continue to improve recoveries of converting roundwood.
- Review the cumbersome and costly systems of processing afforestation licences.
- Improve forest protection to decrease losses from fires, pests, etc.
- Upgrade accuracy of plantation inventory.

**To do this there needs to be substantial improvements in the profile and appreciation of the forest industry.**

### 3. THE IMPORTANCE OF COMMERCIAL FORESTRY IN SOUTH AFRICA

South Africa used to be a world leader in commercial afforestation with the best technology in propagating clones and seedlings as well as in silviculture and management of man-made forests. Unfortunately much of this expertise has been lost to overseas countries, particularly Australia, New Zealand, Brazil and Chile.

Commercial forestry in South Africa has been widely criticised from an environmental and water conservation point of view. This negative attitude according to Forestry South Africa, who represents many of the stakeholders, is often unjustified. It is said to restrict and inhibit development of plantations, despite the fact that compared to the rest of the world, South Africa has the highest proportion of its plantations environmentally accredited at 81% and therefore internationally ranks highly as a candidate for accreditation for the benefits of applying carbon sequestration. However, FSA believe that these efforts have not been generally acknowledged and the forest industry has continued to be discriminated against and its strategic and commercial value under-rated. Some important facts are as follows:

- Comparison of the total plantation area of 1.40 million hectares in South Africa (which covers only 1.2% of the total land area), with other southern hemisphere countries is as follows:

TABLE 6: Analysis of Commercially Afforested Areas: South Africa, Australia, Chile, New Zealand and Brazil

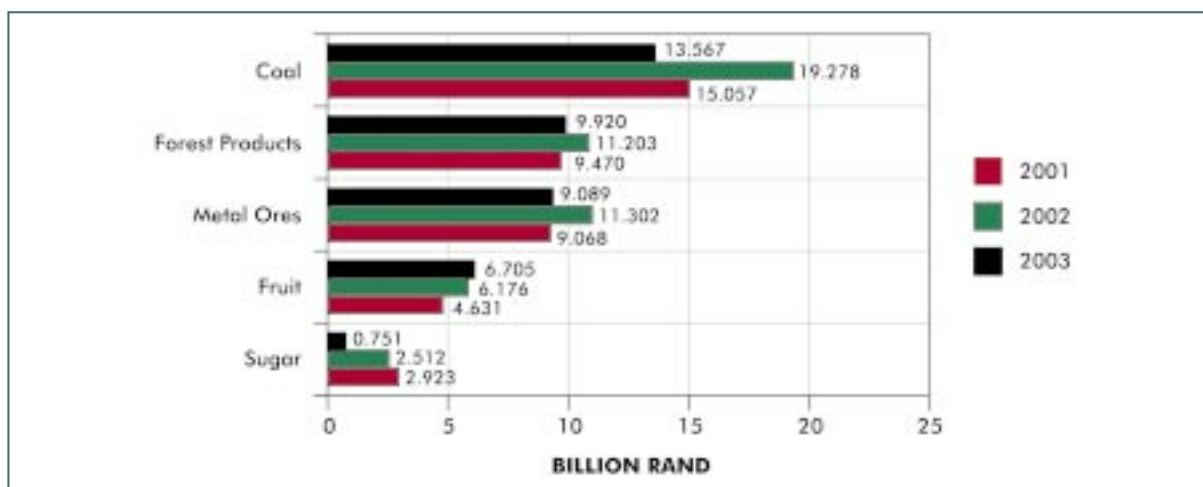
COUNTRY	TOTAL AREA	COMMERCIAL FORESTRY AREA (ha) (Exotic only)				% of total Area of Country
		Hardwood	Softwood	Other	Total	
South Africa	122,103,000	699,306	699,934	8,045	1,399 241	1.2%
Australia	768,000,000	675,962	988,223	1,508	1,665,693	0.22%
Chile	+/- 95,690,000	340,000	1,500,000	160,000	2,000,000	20.9%
New Zealand	27,053,000	52,000	1,590,000	127,000	1,769,000	6.54%
Brazil	N/A	2,300,000	1,500,000	N/A	3,800,000	Not Known

SOURCE: Web sites.

Approximate areas only.

- Forestry and forest products contribute 18.7 billion Rand or 1.55% to the overall GDP of South Africa and 9.7% to the Agriculture, Fisheries and Forestry GDP.
- Forest products' ranked second only to coal as exports, the comparison being as follows:

Figure 1: Forest Products' Exports Compared to Other Industries



(Appendix N)

- The timber industry employs approximately 129,160 people directly as shown below:

TABLE 7

SECTOR	NUMBER OF EMPLOYEES
Forestry	67,460
Sawmilling	21,000
Mining Timber	2,200
Pulp and Paper	15,000
Panel/Particleboard	5,400
Treating/Poles	5,800
Charcoal	5,500
Pallet/Cable Drums/Fruit Bins, etc.	1,400
Roof Trusses	2,400
Timber Transport	3,000
<b>TOTAL</b>	<b>129,160</b>

If the number of those employed directly were extended by a factor of four to include their dependants, the number of people dependent on the timber industry amounts to 516,640. Most of these people are employed in the rural areas where gainful employment is most needed. Furthermore, it is estimated that about 30% to 40% of the employees are female.

## 4. METHODOLOGY AND CONSTRAINTS IN ASSESSING ROUNDWOOD, CHIPS AND WASTE SUPPLY

The primary source of information used to assess potential roundwood supply is the Report on Commercial Timber Resources and Primary Roundwood Products in South Africa 2001/2002, which is the latest such report available. The integrity of the information depends upon the input from the growers. In this regard the following comments apply:

- Professionally managed companies, such as Sappi, Mondi, Safcol, Masonite, Steinhoff, Hans Merensky, NCT and CTC comprise approximately 70% of the forest area and their input is likely to be accurate.
- FES advises that the small grower schemes, such as Khulanathi and Sappi Grow have information submitted by the co-ordinating body and these are included in the resource.
- If there are inaccuracies in the commercial forestry data they are most likely to be found in the independent growers, some of whom may slip through the data collection net. However, these are likely to be the smaller rather than medium or larger of the independent growers. It is acknowledged by FES however that if there are errors they will be as a result of omissions and not overstatements therefore errors are likely to understate rather than overstate the resource. FES advise that in applying their checks and balances they are confident that the maximum understatement of the resource is 90,000 ha at the very most, i.e. 6.3% of the total but that it is likely to be no more than half of that, say 3.5%. Assuming that the extent of the understatement in area would have the same proportionate affect in yield then at the outside this would account for a relatively small volume of say 500,000 tons per annum. This allowance has been included in the supply.

Based on these comments the methodology adopted for assessing and factors affecting the forecast supply are described in the paragraphs that follow.

## 4.1 GROWTH OF TREES: 2002 to 2005

The yield regulation in this study was based on age/area, i.e. effective area divided by rotation age, multiplied by Mean Annual Increment at rotation age.

Data from the Report on Commercial Timber Resources and Primary Roundwood Processing in South Africa 2001/2002 was taken and grown to the start year, 2005, merely by simulating felling and replanting areas as they reached rotation age. Wattle data (as of June 2003) was obtained from industry sources and treated in the same way. Wattle jungle data was acquired from SAWGU and other sources and it is assumed that only 50% of the Wattle jungle area will be rehabilitated and no further timber being generated from the other 50% for commercial purposes. No attempt was made to smooth the annual harvests.

## 4.2 SIMULATED FELLING AREAS

In the 30 year window period a similar process of simulated felling and replanting as described in 4.1 above was used to obtain the volumes used for the projections. Because of an imbalance in age classes, smoothing of yields was done over the period 2009 to 2013 for Eucalypt and 2013 to 2022 for Pine. Mean annual yields were agreed between the authors and can be checked (Appendices F).

## 4.3 PHASING OUT OF PINE SAWLOG AREAS

An allowance was made for the phasing out of the Pine sawlog areas listed in Table 8 from Pine sawlog production. In this projection the areas were systematically phased out to fit in with the simulated felling areas and not replanted. The effect on the pulpwood yields from these areas was taken into account for the purposes of this study.

TABLE 8

REGION	AREA TO BE PHASED OUT (ha)
Limpopo	9,000
Zululand	7,000
Southern Cape	35,000
Western Cape	14,345
<b>TOTAL</b>	<b>65,345</b>

SOURCE: DWAF

Only four of the regions are mentioned as these are the major areas of concern. This is independent of any reductions for environmental reasons as shown in Para 4.4.

## 4.4 ENVIRONMENTAL STANDARDS AREA ALLOWANCE

An initial environmental standards compliance area allowance of 5% is applied in the first rotation of the shorter rotation areas and in the first half of the longer (Pine sawlog and Pine pulpwood) rotation areas. A further 2.5% is deducted from the second rotation for the short rotation areas and in the second half of the longer rotations. Several growers feel that the allowance is too low, but DWAF believe anything more than 2.5% is excessive and this has been accepted with some reservation. The area allowance was applied by not replanting areas as they were felled in the simulation (Table 31).

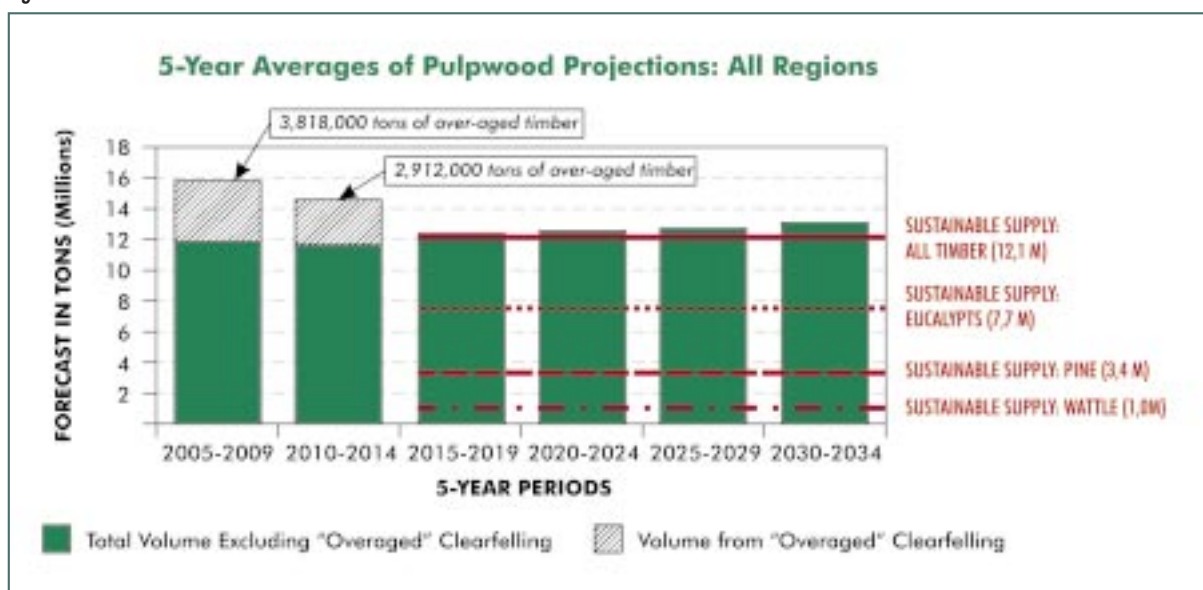
#### 4.5 AREAS IN AGE CLASSES OLDER THAN THE ROTATION AGE

Areas in age classes older than the rotation age were treated separately in the simulation and felled over the following periods:

Pine sawlog	2 periodic blocks	=	10 years
Pine pulpwood	½ a rotation	=	9 years
Eucalypt pulpwood	one rotation	=	9 years
Wattle	½ a rotation	=	5 years

The sustainable supply of 12.1 million tons indicated in Figure 2 has been based on the yields over the last 20 years of the window period. This means that the accumulated over-age timber has not been included in the sustainable supply, which makes the 12.1 million tons per annum slightly conservative.

Figure 2:



#### 4.6 AREA ALLOWANCE FOR DELAYS IN RE-ESTABLISHMENT

Allowances have been made for the delay in replanting of felled areas on the assumption that only 50% of annual felling is re-established in the year of felling and the other half the year after. This has been done by adjusting annually replanted areas downwards, as follows:

Pine sawlog production	Plantable area ÷ 28 years ÷ 2 or 1.8%
Pine pulpwood production	Plantable area ÷ 18 years ÷ 2 or 2.8%
Eucalypt pulpwood production	Plantable area ÷ 9 years ÷ 2 or 5.6%
Wattle bark and pulpwood production	Plantable area ÷ 10 years ÷ 2 or 5.0%

#### 4.7 VOLUME ALLOWANCE FOR FIRE AND SEVERE WEATHER DAMAGE

Fire and weather damage data were collated from the Report on Commercial Timber Resources and Primary Roundwood Processing in South Africa 1991/1992 – 2001/2002 and final volumes were reduced by the calculated average losses per region (Appendices H). Averages show an annual loss of 1.8% of Pine areas and 1.4% of Hardwood areas. No account has been taken of the apparent recent escalation in the extent of fire damage. While Swaziland plantations have not been included in the growing stock the roundwood yield and lumber sold into South Africa has been included. Recently Swaziland has also suffered an increase in the incidence and severity of fires, which has an influence, albeit indirectly, on the supply into South Africa.

The percentages referred to are the reduction in potential production per annum of Pine or Hardwoods respectively. No allowance has been made for salvage.

The scenario explained in Para 10.2 shows an increase in allowance for fire damage based on recent losses.

Snow damage experienced about every ten years in KwaZulu-Natal has recently been extensive in the Wattle plantations with mature damaged plantations having to be felled prematurely and immature plantations having to be abandoned and re-established. No allowance has been made for these potential losses.

#### 4.8 NET INCREASE/DECREASE IN PLANTED AREA PER GENUS: 1991/1992 to 2001/2002 (Appendices I)

In order to generate the data for this, Appendix I was used. All losses and gains for each genus were calculated (i.e. conversions from Pine to Eucalyptus, Eucalyptus to Wattle, Wattle to Agriculture, etc., and areas afforested in each case). The trend of the gains of planted areas for each genus (Pine, Eucalyptus and Wattle) is distinctly downward as indicated in Table 9 below.

TABLE 9:

GENUS	AVERAGE ANNUAL CHANGE IN AREA (ha)		TOTAL AREA IN 2001 (Wattle 2003) (ha)
	1992 – 2001	1997 – 2001	
Pine	1,596	-885	699,934
Wattle	501	459	128,049
Wattle Jungle	-	-	47,100
Eucalypt	4,024	1,198	524,158
<b>TOTAL</b>	<b>6,121</b>	<b>772</b>	<b>1,399,241</b>

SOURCE: Report on Commercial Timber Resources and Primary Roundwood Processing in South Africa: 2001/2002.

NOTE: Negative values are reductions.

In the case of Wattle there has been an increase in planting in the last five years but there seems to be a slow down in the rate of new plantings in the last year and this may have been as a result of the recent decrease in the price of Wattle pulpwood.

Eucalypts showed a considerable increase from 1992 to 1996 but this dropped dramatically between 1997 and 2001 largely as a result of decline in demand for mining timber.

Pine shows a steady decrease between 1991 and 2001 and the trend has now become negative as a result of conversions to Eucalypt pulpwood plantations.

As the trends are downward and areas for all genera have or will shortly become negative (except possibly for Wattle where the volumes in general are small), no allowance is made for any gains in afforested area in the simulated window period. Instead the present situation is regarded as static as far as the areas per genus are concerned.

#### 4.9 MASS TO VOLUME CONVERSION RATIOS

Roundwood, other than sawlogs, traditionally has been purchased in tons, but the working plan data particularly for Pine are expressed in cubic meters, making the volume to mass ratio critical in calculating the forecast yields.

The extent of air drying, i.e. the time between felling and the time of timber being purchased has changed in the case of Eucalypts from six weeks to an average of three weeks and the volume/mass ratio has changed accordingly. The volume/mass ratios used in this study that could be adopted for the sake of consistency are given in Appendix E.

Normally pulpwood is estimated and sold in tons (metric tonnes), therefore, all estimates in this report are quoted in tons, unless otherwise stated.

#### 4.10 MEAN ANNUAL INCREMENTS AT ROTATION AGE (Appendices F)

Mean annual increment figures used are estimates only, based as realistically as possible on the opinions and experience of those involved in compiling this study.

#### 4.11 WATTLE AREAS

Wattle areas and ages, except for Wattle jungle estimates (Para 4.12 below), were obtained from industry sources, then compared with the figures in the Report on Commercial Timber Resources and Primary Roundwood Products in South Africa 2001/2002. These former estimates were found to be some 16% higher and are preferred because the recent usage indicates that the resource is likely to be greater than that contained in the Commercial Timber Resources and Primary Roundwood Processing in South Africa 2001/2002.

#### 4.12 WATTLE JUNGLE AREAS (Appendix J)

Areas of Wattle jungle indicated by timber co-operatives as additional to those listed in Commercial Timber Resources and Primary Roundwood Processing in South Africa 2001/2002 have been included. It is believed that these jungle areas exist but that they are not reported because they are not formal plantations.

It is estimated that 47,100 ha exist as jungle with yields of 3 tons/ha/annum during the first 10 years of the window period. Thereafter the area is expected to be reduced by approximately half but managed as commercial plantations, albeit less intensively, with increased yields to 5 tons/ha/annum as shown in Table 10.

TABLE 10: Analysis of Wattle Jungle Areas

REGION	FIRST ROTATION (10 yrs)				FOLLOWING TWO ROTATIONS (20 yrs)			
	Period (years)	Area (hectares)	MAI (tons per hectare per year)	Yield per Annum (tons)	Period (years)	Area (hectares)	MAI (tons per hectare per year)	Yield per Annum (tons)
Mpumalanga South	10	23,100	3.0	69,300	20	12,800	5.0	64,000
Northern KwaZulu-Natal	10	6,000	3.0	18,000	20	3,300	5.0	16,500
Eastern Cape	10	18,000	3.0	54,000	20	10,000	5.0	50,000
<b>Initial Total Area/Yield:</b>		<b>47,100</b>		<b>141,300</b>		<b>26,100</b>		<b>130,500</b>

**NOTE:** Areas and MAI's were estimated.

A yield of 5 tons/ha/annum was determined in consultation with the co-operatives and it may be conservative, but we are in favour of being conservative as it is not a standard crop and is sensitive to poor management.

#### 4.13 HISTORY OF ROUNDWOOD PURCHASES 1991/1992 to 2001/2002

The history of roundwood purchases as obtained from the Report on Commercial Timber Resources and Primary Roundwood Processing in South Africa 1991/1992 – 2001/2002 is reproduced in Appendix K and shows total annual pulpwood purchases reported by processors to have been 10 million tons. But, the annual pulpwood production in the report as being supplied by the growers over the same period was 8.7 million tons per annum as reported by Forestry South Africa (Table 29). This significant difference illustrates the problems with accuracy being experienced with the Commercial Timber Resources and Primary Roundwood Processing annual figures supplied by the growers.

These figures provided by growers have been ignored for the purposes of this study. The consumption as reported by the processors is considerably more accurate and is used throughout this study and shown in Appendix K.

## 5. SUPPLY (OTHER THAN SAWLOGS)

### 5.1 GROWING STOCK BY GENUS AND AGE

The 1,399,240 ha of commercial plantations are accounted for as follows:

TABLE 11: Areas Used in the Study in Hectares by Genus and Age Class in Five Year Age Groupings on 01/06/2002\*: All Regions

AGE IN YEARS	PINE	E.GRANDIS	OTHER EUCALYPTUS SPECIES	WATTLE* As on 30/06/2003	TOTAL
Temporarily Unplanted	45,253	10,209	6,908	10,078	72,449
0 – 4	151,568	119,421	108,916	55,242	435,147
5 – 9	160,254	118,814	86,587	52,464	418,118
10 – 14	142,153	34,973	21,435	9,182	207,743
15 – 19	86,931	8,363	2,165	1,083	98,542
20 – 24	55,050	1,407	600	-	57,056
25 – 29	34,042	897	285	-	35,225
30 +	24,683	1,517	1,661	-	27,861
Wattle Jungle	-	-	-	47,100	47,100
<b>TOTALS</b>	<b>699,935</b>	<b>295,600</b>	<b>228,557</b>	<b>175,149</b>	<b>1,399,241</b>

Figure 3



SOURCE: Report on Commercial Timber Resources and Primary Roundwood Processing in South Africa: 2001/2002. Areas Excluded: Jungle (except the Wattle Jungle areas which were estimated), and Pine grown for "Other Products" in the Southern and Western Cape Regions.

Wattle regions were based on Extract Factory or Collection Depot location.

\* Wattle as on 30/06/2003.

### COMMENTS

- Wattle has been over-felled and can sustain only 1,045,300 tons on average per year (Table 5). Of this approximately 140,000 tons per annum are derived from jungle plantations.
- Pine sawlogs have been and continue to be over-felled as evidenced by the decline in average age from 14.7 years to 11.3 years between 1983 and 2003. To sustain the current market for sawn timber (including peeler logs) 5,250,000 m<sup>3</sup> of sawlogs are required per annum, but the industry can only sustain 4,040,000m<sup>3</sup> per annum. This has been dealt with in detail in the Supply and Demand Study of

Softwood Sawlog and Sawn Timber 2004 (which can be obtained from DWAF). Sections 9 and 10 summarise the overall supply and demand including sawlogs.

- The felling cycle for Eucalypts is between six and ten years and on average current plantations can sustain only 8.6 million tons per annum. However, because there are approximately 73,000 ha of Eucalypts in excess of ten years of age the harvest will amount to 9.96 million tons in the 2005 to 2009 period and 9.38 million tons during the 2010 to 2014 five year period before the harvest declines to the sustainable yield of 8.6 million tons per annum (Tables 4 and 25, Figure 4).

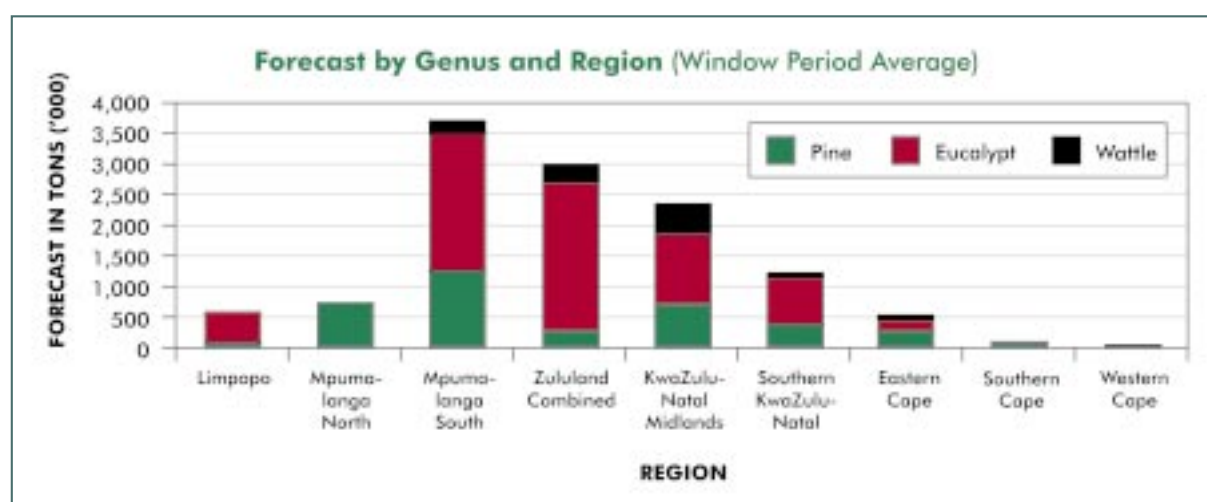
## 5.2 YIELDS BY GENUS AND REGION

Table 12 and Figure 4 cover the full window period of 2005 to 2034 and include over-age timber. Therefore, in our opinion it is a slight over estimate, but nevertheless is used in the projections.

TABLE 12: Analysis of Forecast by Genus and Region: Window Period Average:

REGION	FORECAST IN TONS			
	GENUS			TOTAL
	Pine	Eucalypt	Wattle	
Limpopo	46,600	517,000	-	563,600
Mpumalanga North	684,600	1,373,000	-	2,057,600
Mpumalanga South CD (Combined)	1,330,900	2,174,400	194,700	3,700,000
Zululand Combined	278,200	2,442,000	284,300	3,004,500
KwaZulu-Natal Midlands	703,600	1,180,600	485,700	2,369,900
Southern KwaZulu-Natal	397,500	776,000	29,500	1,203,000
Eastern Cape	302,800	165,900	50,900	519,600
Southern Cape	66,400	10,000	-	76,400
Western Cape	13,300	2,500	-	15,800
<b>TOTAL</b>	<b>3,823,900</b>	<b>8,641,400</b>	<b>1,045,100</b>	<b>13,510,400</b>

Figure 4



Reductions have been applied to allow for losses as a result of fire and severe weather. Mpumalanga South/Central Districts (Combined) includes both Regions' data, Zululand and Northern KwaZulu-Natal Regions. Adjustments made to make provision for differences as a result of rounding.

### 5.3 PROJECTED YIELDS – 2005 TO 2034

TABLE 13: Projected Yields of Roundwood other than Sawlogs in Tons: All Regions: 2005–2034

YEAR	TONS							% Reduction for Fires and Other Factors: Softwood	% Reduction for Fires and Other Factors: Hardwoods	TONS Total Forecast (Rounded to 100)
	Pine (1.00)	E. grandis (1.37)	Other Eucalypts (1.16)	Wattle (1.138)	Wattle Jungle (1.138)	Wattle Total	Total Hardwoods			
2005–06	3,755,778	5,628,437	5,333,350	1,107,460	141,300	1,248,760	12,210,547	1.8%	1.4%	15,724,000
2006–07	4,227,829	5,497,208	5,061,933	1,133,527	141,300	1,274,827	11,833,967	1.8%	1.4%	15,815,800
2007–08	4,674,129	5,425,285	4,564,659	1,254,486	141,300	1,395,786	11,385,731	1.8%	1.4%	15,811,700
2008–09	5,034,668	5,515,629	4,736,174	1,174,632	141,300	1,315,932	11,567,735	1.8%	1.4%	16,344,800
2009–10	5,630,998	4,854,593	3,907,957	972,910	141,300	1,114,210	9,876,760	1.8%	1.4%	15,262,500
<b>Annual Average: 2005–2009</b>	<b>4,664,680</b>	<b>5,384,230</b>	<b>4,720,815</b>	<b>1,128,603</b>	<b>141,300</b>	<b>1,269,903</b>	<b>11,374,948</b>	<b>1.8%</b>	<b>1.4%</b>	<b>15,791,800</b>
2010–11	5,898,172	4,838,400	3,903,443	962,503	141,300	1,103,803	9,845,645	1.8%	1.4%	15,493,900
2011–12	4,179,950	4,828,107	3,905,712	855,561	141,300	996,861	9,730,679	1.8%	1.4%	13,695,000
2012–13	4,068,761	4,821,465	3,904,116	858,601	141,300	999,901	9,725,482	1.8%	1.4%	13,580,800
2013–14	4,168,157	4,833,157	3,916,636	809,169	141,300	950,469	9,700,262	1.8%	1.4%	13,653,400
2014–15	3,221,579	6,315,091	6,284,451	584,142	141,300	725,442	13,324,984	1.8%	1.4%	16,298,800
<b>Annual Average: 2010–2014</b>	<b>4,307,324</b>	<b>5,127,244</b>	<b>4,382,872</b>	<b>813,995</b>	<b>141,300</b>	<b>955,295</b>	<b>10,465,410</b>	<b>1.8%</b>	<b>1.4%</b>	<b>14,544,400</b>
2015–16	3,435,625	4,584,749	4,452,927	1,230,101	130,500	1,360,601	10,398,277	1.8%	1.4%	13,623,000
2016–17	3,051,929	4,506,129	3,952,543	1,055,024	130,500	1,185,524	9,644,196	1.8%	1.4%	12,503,100
2017–18	3,099,779	4,634,205	4,144,180	1,175,984	130,500	1,306,484	10,084,869	1.8%	1.4%	12,984,600
2018–19	3,107,961	3,979,030	3,292,522	1,096,130	130,500	1,226,630	8,498,182	1.8%	1.4%	11,428,100
2019–20	3,190,743	3,984,538	3,294,465	894,407	130,500	1,024,907	8,303,910	1.8%	1.4%	11,317,800
<b>Annual Average: 2015–2019</b>	<b>3,177,207</b>	<b>4,337,730</b>	<b>3,827,327</b>	<b>1,090,329</b>	<b>130,500</b>	<b>1,220,829</b>	<b>9,385,887</b>	<b>1.8%</b>	<b>1.4%</b>	<b>12,371,300</b>
2020–21	3,285,986	3,999,733	3,293,436	905,143	130,500	1,035,643	8,328,813	1.8%	1.4%	11,435,800
2021–22	3,018,941	4,316,801	3,578,479	798,201	130,500	928,701	8,823,981	1.8%	1.4%	11,662,000
2022–23	3,084,907	4,321,639	3,577,860	801,242	130,500	931,742	8,831,241	1.8%	1.4%	11,733,900
2023–24	3,229,957	6,016,793	5,995,139	751,810	130,500	882,310	12,894,241	1.8%	1.4%	15,882,300
2024–25	3,678,578	4,333,824	4,164,510	584,142	130,500	714,642	9,212,977	1.8%	1.4%	12,692,700
<b>Annual Average: 2020–2024</b>	<b>3,259,674</b>	<b>4,597,758</b>	<b>4,121,885</b>	<b>768,108</b>	<b>130,500</b>	<b>898,608</b>	<b>9,618,251</b>	<b>1.8%</b>	<b>1.4%</b>	<b>12,681,300</b>
2025–26	4,194,631	4,247,171	3,665,114	1,172,742	130,500	1,303,242	9,215,527	1.8%	1.4%	13,201,400
2026–27	4,561,785	4,384,364	3,836,877	997,665	130,500	1,128,165	9,349,406	1.8%	1.4%	13,693,600
2027–28	5,067,246	3,689,904	3,007,123	1,118,625	130,500	1,249,125	7,946,152	1.8%	1.4%	12,805,900
2028–29	4,944,624	3,687,418	3,006,634	1,038,771	130,500	1,169,271	7,863,322	1.8%	1.4%	12,603,900
2029–30	3,868,952	3,689,365	3,008,145	837,048	130,500	967,548	7,665,058	1.8%	1.4%	11,353,200
<b>Annual Average: 2025–2029</b>	<b>4,527,447</b>	<b>3,939,644</b>	<b>3,304,779</b>	<b>1,032,970</b>	<b>130,500</b>	<b>1,163,470</b>	<b>8,407,893</b>	<b>1.8%</b>	<b>1.4%</b>	<b>12,731,600</b>
2030–31	4,093,789	4,331,086	3,614,619	847,784	130,500	978,284	8,923,989	1.8%	1.4%	12,815,100
2031–32	4,013,734	4,325,870	3,578,218	740,842	130,500	871,342	8,775,430	1.8%	1.4%	12,590,000
2032–33	3,085,237	6,041,366	5,996,065	743,883	130,500	874,383	12,911,813	1.8%	1.4%	15,757,700
2033–34	3,025,452	4,312,157	4,166,946	694,450	130,500	824,950	9,304,054	1.8%	1.4%	12,141,800
2034–35	2,972,247	4,225,452	3,669,483	584,142	130,500	714,642	8,609,578	1.8%	1.4%	11,404,800
<b>Annual Average: 2030–2034</b>	<b>3,438,092</b>	<b>4,647,186</b>	<b>4,205,066</b>	<b>722,220</b>	<b>130,500</b>	<b>852,720</b>	<b>9,704,973</b>	<b>1.8%</b>	<b>1.4%</b>	<b>12,941,900</b>
<b>Annual Average: 2005–2034</b>	<b>3,895,737</b>	<b>4,672,299</b>	<b>4,093,791</b>	<b>926,038</b>	<b>134,100</b>	<b>1,060,138</b>	<b>9,826,227</b>	<b>1.8%</b>	<b>1.4%</b>	<b>13,510,400</b>

## 5.4 RESOURCES IN OTHER SADC COUNTRIES

Because Swaziland and Zimbabwe already contribute towards meeting some of the demand for forest products in South Africa and the fact that there are additional areas suitable for new afforestation in the neighbouring SADC countries, notably Mozambique, it is logical that this overview be provided. Not included, but should perhaps be noted is that the Republic of Congo has some 50,000 ha of commercial Eucalypts at Pointe Noire, which will generate about one million tons per annum.

### 5.4.1 Swaziland

Usutu Pulp Company Ltd., owned by Sappi; Piggs Peak plantation and sawmill owned by Mondi; independently owned Swaziland Plantations (Pty) Ltd.; and Shiselweni Plantations owned by TWK Landbou Beperk comprise with a few minor exceptions all the commercial forests which are estimated to total 132,400 ha as shown below.

TABLE 14

	AREA (ha)
Pine	86,000
Eucalypt Sawlog	12,400
Eucalypt	9,000
Wattle Jungle	25,000
<b>TOTAL</b>	<b>132,400</b>

Usutu processes all their Pine pulp in their Usutu mill and the roundwood yield has therefore been ignored in this study. Peak Timbers is in the process of converting the Pine plantations to Eucalypt sawlogs and have already converted 12,400 ha to Eucalypt with only 6,700 ha of Pine remaining. The changeover should be complete by 2011.

Swaziland could be an option for obtaining further suitable land to expand the plantation resource. Rainfall and soils in the Northern, Western parts and sections of Central Swaziland are highly suitable for commercial afforestation. With an unemployment rate of over 70% the people of Swaziland could be receptive to a planting programme of some size.

### 5.4.2 Zimbabwe

The Zimbabwean plantations account for only 3% of the land area and the growing stock is summarised as follows, which includes plantations expropriated for resettlement and/or destroyed by invaders in 2003/2004.

TABLE 15: Age Area Distribution Excluding Sawlogs

YEARS	1 – 5	6 – 10	11 – 15	16 – 20	21 – 25	25 >	UNKNOWN	TOTAL
Pine (ha)	13,852	16,756	14,331	12,229	6,294	7,264	179	70,905
Eucalyptus (ha)	11,716	7,033	2,346	304	137	985	3,957	26,478
Wattle (ha)	5,857	3,191	790	0	0	0	10	9,848
<b>Total Plantation (ha)</b>	<b>31,425</b>	<b>26,980</b>	<b>17,467</b>	<b>12,533</b>	<b>6,431</b>	<b>8,249</b>	<b>4,146</b>	<b>107,231</b>

The annual exports into South Africa are approximately 85,000 m<sup>3</sup> of softwood sawn timber, 9,000 m<sup>3</sup> of Eucalypt sawn timber and 12,000 tons of charcoal from Wattle with a roundwood equivalent of 56,000 tons.

### 5.4.3 Malawi

Malawi has approximately 45,000 ha of mature Pine on the Viphya Flats on their Northern border with Tanzania, apart from some smaller plantations in the Central and Southern parts. However, distances preclude this from being a viable source of supply to South Africa at present.

#### 5.4.4 Mozambique

It is estimated that there are at least a further 80,000 ha of vacant but suitable forestry land accessible to South Africa via the Beira Corridor. The Mozambique Government are keen to have commercial plantations established and this could become a meaningful ancillary resource of pulpwood. However, there is a possibility of a chipping plant being installed in Maputo which would need to draw its supplies initially from South Africa.

#### 5.4.5 Angola and Zambia

Although distance may preclude the economics of growing timber for South Africa, both of these countries have large areas of good forest land that could be used to grow timber should South Africa ever become a viable option for them.

Zambia is a landlocked country with a very high cost of transport which would probably also prohibit the growing of pulpwood for South Africa.

#### 5.4.6 Tanzania

Rainfall and soils along the East Coast of Tanzania both North and South of Dar-es-Salaam are good and suitable for growing of Eucalypt clones. The heart of the Eastern timber growing region is Segera situated approximately 150 kilometres inland from the Tanga harbour (which lies approximately midway between Dar-es-Salaam and Mombassa). Other areas with high forestry potential lie in the highlands in the West near Njombe. Major plantations are those of the Tanganyika Wattle Company Ltd. (Tanwat) with some 14,000 ha under Wattle (63%), Pine (31%) and Eucalypt (6%) and the Soa Hills Pine plantations +/- 5,000 ha of the Southern Highlands Pulp Milling Company. Possible chipper sites are Tanga which is a naturally deep water harbour or Dar-es-Salaam. These harbours are also well situated to export to India or to Richards Bay in South Africa.

### 5.5 NEW FOREST AREAS

If the plantation area in South Africa were to be expanded to meet the demand, between 700,000 and 900,000 ha of additional plantation area would be required to fulfil that need. If the shortfall were to be established over ten years this would require an annual planting rate, which is possible if compared to those being achieved by competitor countries.

TABLE 16

COUNTRY	AVERAGE ANNUAL NEW PLANTINGS (ha)	PERIOD
Australia	82,684	1999 – 2003
Chile	100,000	1990 – 1999
New Zealand	62,480	1995 – 1999
South Africa	6,121	1992 – 2001
South Africa	772	1997 – 2001

SOURCE: Web Pages

The question that arises is whether South Africa has sufficient available land and in this regard work done in the past is relevant.

In 1989 the Directorate of National Forest Planning produced a strategic forestry development plan which followed the initial plan done in 1982. These reports were funded by DWAF but the source of the information was the CSIR.

The strategic forestry plan was developed after very thorough research and investigation into the timber needs in the years that were to follow. It was evident even in 1989 that the South African forestry resource

would need to be expanded substantially. The committee also researched all the potential forestry sites and a summary of its conclusions is quoted as follows:

**TABLE 17: Summary of Potential Suitable and Available Areas for Afforestation**

The committee summarised its findings as to afforestation in the various priority areas, excluding the national states, as per the table below:

	REGION	AREA (ha)				TOTAL
		GOOD LAND		MARGINAL LAND		
		Readily Available	Restricted Availability	Readily Available	Restricted Availability	
1	Venda	0	1,500	0	0	1,500
2	Letaba	0	14,800	0	0	14,800
4	Pilgrims Rest	10,100	0	3,500	0	13,600
5	Treur River	1,700	0	0	0	1,700
6	Mariti River	4,700	0	400	0	5,100
7	Long Tom Pass	4,000	1,000	1,000	700	6,700
8	Rhenosterhoek	300	200	0	0	500
9	Eastern Transvaal State Forests	1,800	400	500	200	2,900
10	Crocodile River	39,200	37,000	7,000	36,000	119,200
11	Komati River	43,600	20,000	11,800	10,000	85,400
12	Usuthu River	86,000	16,500	0	0	102,500
13	Middelsburg – Belfast	0	0	40,000	20,000	60,000
14	Wakkerstroom	72,000	0	15,000	0	87,000
15	Vaal	0	72,400	0	0	72,400
18	Northern KwaZulu-Natal	81,800	0	64,500	0	146,300
19	Remainder of KwaZulu-Natal	155,000	0	84,700	0	239,700
20	Griqualand East	50,000	0	20,000	0	70,000
23	Eastern Cape Coast	18,000	7,100	20,000	26,600	71,700
24	Eastern Cape Mountains	30,000	9,000	20,000	16,500	75,500
25	Elliott Maclear	87,000	0	49,000	0	136,000
26	Tsitskama	26,700	0	59,000	0	85,700
27	Southern Cape	40,000	0	3,800	0	43,800
28	Western Cape	22,600	10,000	4,400	10,000	47,000
	<b>TOTAL</b>	<b>774,500</b>	<b>189,900</b>	<b>404,600</b>	<b>120,000</b>	<b>1,489,000</b>

**NOTE:**

This was based on CSIR studies commissioned by the Dept. of Forestry and fully supported by scientific reports and a series of 1 : 250 000 map overlays. However, DWAF today contend that this report was flawed.

In addition to the 774,500 ha of good, readily available land, the plan indicated a further 432,100 ha of good land from the former homelands was suitable as shown below:

**TABLE 18**

NATIONAL STATE	AREA (ha)		TOTAL (ha)
	Good Land	Marginal Land	
Venda	29,300	18,500	47,800
Lebowa	37,400	4,100	41,500
Swazi	75,000	0	75,000
KwaZulu	178,000	272,200	450,200
Transkei	100,000	0	100,000
Ciskei	12,400	15,200	27,600
<b>TOTAL</b>	<b>432,100</b>	<b>310,000</b>	<b>742,100</b>

SOURCE: Strategic Forestry Development Plan for South Africa 1989

The Development Plan states that if the areas classified as 'Good Land' in Tables 17 and 18 are included the total area potentially available amounted to 1,206,600 ha, representing an annual rate of afforestation of 48,264 ha over a period of 25 years.

While the experts involved in drafting the Strategic Plan may have been optimistic regarding the available area their views speak for themselves and show clearly how far the legislation and restraints on afforestation have moved to contain the expansion of commercial plantations. In view of the decline in the sustainable yield FSA maintain that it would be wise for all stakeholders to review the restraints and ensure that whatever constraints are in place are absolutely necessary and furthermore that the cumbersome and costly procedures for obtaining additional afforestation licences are reduced to bare essentials and vested interests eliminated. FSA maintain that the requirements for acquiring a licence to plant trees are so cumbersome and costly and take so long to process, that growers are discouraged from attempting to acquire licences for new plantings.

South Africa generally is a dry country and there is little doubt that the conservation of water is paramount. Plantation owners have however recognised and addressed this where today no less than 81% of the plantations have been accredited with international environmental and conservation standards (FSC and ISO) which is something that no other country has achieved.

The area required for new afforestation is substantial and the following comments address the needs and practicalities of accomplishing this:

- The shortage of softwood sawlogs from South African plantations is serious. To sustain the existing markets for sawn timber 5.25 million m<sup>3</sup> of sawlogs per annum will be required, but the plantations can only sustain 3.81 million m<sup>3</sup> per annum. However, there is likely to be a surplus of Pine pulpwood and it is assumed that small log milling will use 500,000 tons per annum of small logs ex. pulp by 2007.
- Exports of sawn timber and downstream products amounted to +/- 35% in 2001. Due largely to the value of the Rand at R 5.8/USD in December 2004, exports had fallen to an estimated 12% (Source: Lumber Index). However the building sector is more active than ever before and due to a shortage of sawlogs, South Africa is likely to have to resort to importing, rather than exporting sawn timber.
- Sawlog harvesting increased as a result of sales of sawn timber in South Africa unexpectedly doubling (from 1.2 million m<sup>3</sup> in 1994 to 2.5 million in 2004) and at the same time export of sawlogs commenced for the first time. As a result the sawlog plantations have been over-felled and ages have fallen from an average of 14.14 years to the current 11.25 years, i.e. rotation age has fallen from approx. 30 years to less than 23 years.
- Profits from timber growing are not good and a Real Rate of Return of 5% to 6% is normal (FES and CA). This is no great incentive to investors in addition to which plantation owners in South Africa have to contend with a number of issues that are not conducive to investment, namely:
  - ~ Extensive land claims;
  - ~ Municipal rates being applied to plantation owners;
  - ~ South Africa is the only country in the world where growers are required to pay tax on the estimated effect that trees have on stream flow reduction – this being to the exclusion of all other crops, such as sugar, etc.;
  - ~ Black Economic Empowerment (BEE) while welcomed by the industry at large, does place pressure on investors, which is a challenge that investors in other countries do not have;
  - ~ There are no tax incentives for establishing plantations such as there are in countries like Chile;
  - ~ The administration and the laws for acquiring a licence to plant trees have become so cumbersome and expensive that frequently plantation owners consider it impossible and not worth attempting;
  - ~ Minimum wages;
  - ~ High cost of imported capital equipment;
  - ~ The incidence of fire is very high and there is no assistance in the form of subsidies for fire protection as there is in some other countries, such as the Southern States in the USA;
  - ~ The cost of plantation insurance is becoming prohibitive.

## 5.6 RECOMMENDED ACTION TO EXPAND THE RESOURCE

The following comments merely recommend broadly what needs to be done. How it is to be accomplished has not been dealt with as that would call for a high level action plan which is beyond the Terms of Reference of this study and would best be developed by a partnership headed by Forestry South Africa and the Government, with involvement from other stakeholders. It must be pointed out that the National Forestry Action Plan of 1997 is still valid. By 2004 DWAF has not produced another NFAP nor has it carried out expected investigations and commissioned tasks as set out in the NFAP of 1997. DWAF nevertheless supports the goal, "To put into place those measures which promote the development of an industrial forest sector so that it contributes fully to the future economic and social well-being of South Africa, within the parameters of acceptable social and environmental impacts."

To this end, in consultation with FSA, the following recommendations are made:

- Continue to implement all aspects of improving the vigour and productivity of new plantings.
- Review and substantially streamline the process of afforestation licensing.
- Review and substantially reduce all extraneous rates and levies.
- Improve the accuracy of the supply and demand base information.
- Reduce the incidence and extent of fire damage.
- Seek ways of making additional land available for forestry.
- DWAF forestry should, in accordance with the NFAP actively contribute to, facilitate and promote this flourishing wealth-creating industry.
- Global warming presents a very real threat to the forests and there is a need to increase diligence in monitoring the extent and severity of the effects.
- Cognisance should be taken of the opportunities to benefit from accreditation arising from carbon sequestration.
- Update this forecast annually to monitor progress in order to assist the industry in its planning.

**"Above all, there needs to be a substantial improvement in the profile and appreciation of the forest industry". Comment by Brian Aitkin, former Chairman of Forestry South Africa.**

## 6. METHODOLOGY AND CONSTRAINTS IN FORECASTING THE DEMAND

Pulp, paper, particleboard and mining timber production are very competitive activities and information is not freely shared by all particularly with regard to future planning.

The purpose of this study is to assist and promote the interests of the stakeholders and every effort has been made therefore to avoid interfering with the confidentiality or competitiveness of the players. At the same time information is provided which is useful to all stakeholders for forward planning. Timber users are comfortable with disclosing current usage but are generally not keen to disclose their plans for the future. Only known and published expansion or changes (e.g. from one genus to another) have been used for the period 2005 to 2009.

Because of the competition for the resource the question of what each company owns has been avoided and focus has been on the overall regional resource areas and yields.

The information contained in the Commercial Forestry Resource annual report is invaluable as it is the only base data available. However, there are areas of concern, particularly the reporting of sales by growers. There are also inaccuracies in the plantation growing stock and those are probably due to lack of submission of annual returns by very small growers.

## 7. EXPECTED DEMAND OTHER THAN FOR SAWLOGS

### 7.1 2005 DEMAND FOR ROUNDWOOD OTHER THAN SAWLOGS ('000 tons – rounded to the closest 1,000 tons)

TABLE 19

	SOFT- WOOD Logs	SUB TOTAL	Wattle	HARDWOOD		SUB TOTAL	TOTAL
				Hard Gum	E.grandis		
<b>PULP AND PAPER</b>							
Sappi	Enstra	-	-	280	-	280	280
	Ngodwana	1,000	1,000	250	700	950	1,950
	Mandini	800	800	220	-	220	1,020
	Saiccor	-	-	200	1,950	2,340	2,340
Mondi	Richards Bay	431	431	1,421	1,050	2,471	2,902
	Merebank	485	485	-	-	-	485
	Piet Retief	-	-	-	70	70	70
<b>Sub Total</b>		<b>2,716</b>	<b>2,716</b>	<b>190</b>	<b>2,371</b>	<b>3,770</b>	<b>9,047</b>
<b>BOARD MILLS</b>							
Masonite		-	-	-	200	200	200
Sonae	White River	13	13	-	80	80	93
	Panbult	43	43	-	65	65	108
	George	8	8	-	-	-	8
PG Bison	Piet Retief	100	100	-	-	-	100
	Pietermaritzburg	37	37	-	10	64	101
	Stellenbosch	18	18	-	10	10	28
	Boksburg	-	-	-	60	60	60
Chipboard Industries	near Langeni	66	66	-	-	-	66
<b>Sub Total</b>		<b>285</b>	<b>285</b>	<b>-</b>	<b>85</b>	<b>394</b>	<b>764</b>
<b>CHIPPING PLANTS</b>							
CTC	Richards Bay	-	700	527	1,173	2,400	2,400
Silvancel		-	324	871	720	1,915	1,915
Shincel		-	100	60	460	620	620
NCT	Durban	-	-	-	350	350	350
<b>Sub Total</b>		<b>-</b>	<b>1,124</b>	<b>1,458</b>	<b>2,703</b>	<b>5,285</b>	<b>5,285</b>
<b>MINING TIMBER EXPORTS</b>							
		-	-	200	579	779	779
<b>Sub Total</b>		<b>-</b>	<b>-</b>	<b>200</b>	<b>579</b>	<b>779</b>	<b>779</b>
<b>OTHER</b>							
Poles	70% Recovery	316	316	-	446	446	762
Charcoal Timber		-	400	472	-	872	872
<b>TOTAL CONSUMED IN RSA</b>		<b>3,317</b>	<b>3,317</b>	<b>1,714</b>	<b>4,586</b>	<b>7,892</b>	<b>17,509</b>
<b>LESS</b>							
Swaziland		25	25	10	100	110	135
Zimbabwe		-	-	56	-	56	56
Namibia		-	-	80	-	80	80
<b>TOTAL DEMAND FOR RSA</b>		<b>3,292</b>	<b>3,292</b>	<b>1,648</b>	<b>4,506</b>	<b>7,792</b>	<b>17,238</b>
Waste excluded							688

#### NOTES:

1. Export of Eucalypt and Pine roundwood terminated.
2. Merebank intake reduced from 617,000 to 485,000 tons Pine.
3. Mondi Richards Bay intake increased by 600,000 tons Eucalypt.
4. SAICCOR increased by 200,000 tons Eucalypt.
5. PG Bison Piet Retief convert to Pine.
6. NCT Durban up to full production.
7. Mining Timber reduced by 50,000 tons per annum.

## 7.2 2005 PULPWOOD DEMAND FOR WASTE ('000 tons – rounded to the closest 1,000 tons)

TABLE 20

		SOFTWOOD Chips + Waste	HARDWOOD Waste	TOTAL
<b>PULP AND PAPER</b>				
Sappi	Enstra	-	-	-
	Ngodwana	122	-	122
	Mandini	102	-	102
	Saiccor	-	-	-
Mondi	Richards Bay	-	-	-
	Merebank	-	-	-
	Piet Retief	-	-	-
<b>Sub Total</b>		<b>224</b>	<b>-</b>	<b>224</b>
<b>BOARD MILLS</b>				
Masonite		-	-	-
Sonae	White River	17	37	54
	Panbult	43	-	43
	George	29	5	34
PG Bison	Piet Retief	51	30	81
	Pietermaritzburg	6	27	33
	Stellenbosch	25	-	25
	Boksburg	5	60	65
Chipboard Industries		-	44	44
	Langeni	47	-	47
<b>Sub Total</b>		<b>223</b>	<b>203</b>	<b>426</b>
SILICON SMELTERS				27
HEATLOG				10
<b>GRAND TOTAL</b>		<b>447</b>	<b>203</b>	<b>688</b>

**NOTE:**

While the overall volume of Gum is accurate the split between Hard Gum and Grandis is interpolated and is not accurate.

For ease of access these tables have been repeated in Appendix C, which also includes projections to 2009.

## 7.3 SUMMARY OF TOTAL USE (including waste and sawlogs) – '000s tons

TABLE 21

2005	'000s TONS	(REFERENCES)
Roundwood	17,238	(Appendix C)
Waste and chips	688	(Table 20)
Imports	271	(Table 19)
Softwood sawlog	5,070	(Softwood Sawlog report)
Eucalypt sawlog	184	(Para 9.2)
	<b>23,451</b>	

## 7.4 COMMENT ON THE EXPECTED DEMAND

Forecasting the future is hazardous under any circumstances and is made even more difficult by predicting export markets where exchange rates and interest factors play such a major role. Forecasting becomes even more complex when sensitivities of competition between the role players who compete for the resource are taken into account. In order to avoid conflict between competitors, the demand in this exercise has been based simply on current usage and the projections have been estimated on a globular rather than a

company or even sector basis (Appendix C). The volumes have been obtained with the consent of the relevant companies and where this was not the case the volumes have been estimated by the authors.

The supply and demand situation for roundwood other than sawlogs is summarised as follows. South Africa is currently (2004) using approximately 17.1 million tons per annum, excluding 0.7 million tons that come from waste. The sustainable harvest in South Africa is 12.1 million tons per annum but with accelerated felling of over-age timber the supply will increase annually to 15.8 million tons for the first five years and 14.5 million tons for the second five year period 2010 to 2014. Thereafter the harvest declines to 12.4 million tons per annum for the next five years and 12.7 million tons per annum for the fourth five year period, i.e. 2020 to 2024 (Table 24). It is clear therefore that there is insufficient resource to sustain the current processing. While 5.1 million tons are being exported in chip form, depending upon the economics and profitability of making chips compared to that of manufacturing pulp and paper it would seem likely that some, if not all, of the chip supply instead of being exported will be turned to servicing the local downstream plants – pulpmills.

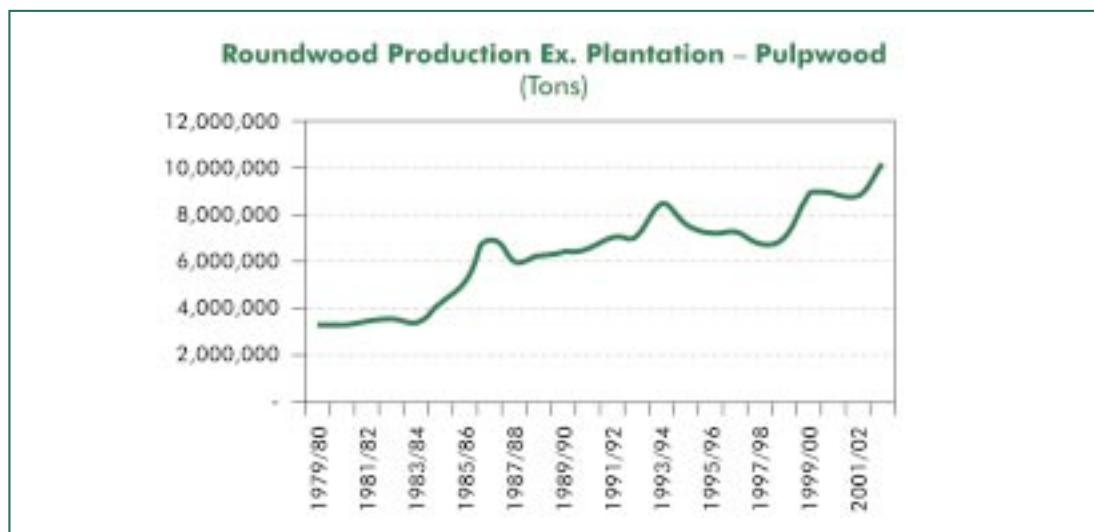
In view of the shortage of sawlogs to produce sawn timber and the projected surplus of 1.3 million tons of Pine pulp in the first ten years it is very likely that sawmills will specialise in small wood milling and will draw off up to 0.5 million tons of pulpwood per annum to be utilised as sawlogs.

Comments on the usage of timber by sector are given in the following sub paragraphs of this section.

### 7.4.1 Pulp and Paper

The use of pulpwood roundwood has increased over the past eleven years by 5.29% per year, as follows:

Figure 5



(Table 29)

Worldwide pulp and paper mills tend to expand every seven to ten years with significant volume increases to offset high capital expenditure and improve economies of scale, rather than at an even or slow rate of increase.

The pulp and paper mills may also change the mix of product. This may well occur in the case of Ngodwana which it is rumoured is to change from using largely softwood to hardwood and increase capacity.

NCT have signed an agreement with Södra Cell, a subsidiary of Södra, a large Swedish forestry co-operative to investigate the feasibility of building a pulp mill at Richards Bay. The purpose of the mill, which is to be known as Pulp United (Pty) Ltd. with an expected output of 300,000 tons per annum will be to process some of the Eucalyptus pulpwood of the NCT members, i.e. 400,000 to 500,000 tons of roundwood per annum. The pulp mill is expected to come on stream in 2007.

Mondi are increasing their Richards Bay plant capacity by 600,000 tons of Eucalypts which is expected to come into effect in 2005.

SAICCOR have embarked on a R330 million capital expansion, which is expected to increase their roundwood intake by 200,000 tons per annum by 2005.

A new particleboard plant is expected to be installed near Mthatha with a capacity of 100,000 tons per annum of which 40,000 tons will be chips and the balance softwood logs.

## 7.4.2 Board Mills

While interest rates remain low and building activity remains strong the market for particleboard and hardboard exceeds the capacity to supply. The board mills have also been successful in reducing the intake of roundwood compared to waste to 36% in favour of waste. Their performance is summarised below:

TABLE 22: Particle Board and MDF Market (tons)

	2002	2003	2004	2005 Est.
<b>PARTICLE BOARD</b>				
Domestic Sales	540,000	546,000	562,000	590,000
Imports by Third Parties	5,000	8,000	15,000	15,000
Exports	20,000	18,000	18,000	15,000
<b>TOTAL PARTICLE BOARD</b>	<b>565,000</b>	<b>572,000</b>	<b>595,000</b>	<b>620,000</b>
<b>MDF</b>				
Domestic Production	96,000	98,000	103,000	110,000
Imports by Third Parties – thicknesses >9mm	2,000	5,000	10,000	10,000
Imports by Third Parties – thicknesses <9mm	8,000	8,500	10,000	11,000
Exports	5,000	4,000	4,000	4,000
<b>TOTAL MDF</b>	<b>111,000</b>	<b>115,500</b>	<b>127,000</b>	<b>135,000</b>

### NOTES

Domestic Particle Board producers consist of PG Bison, Sonae and CIT

Domestic MDF producers consist of PG Bison and Sonae

Imports of both Particle Board and MDF by Sonae and PG Bison to supplement peak period capacity shortfalls are included in domestic sales.

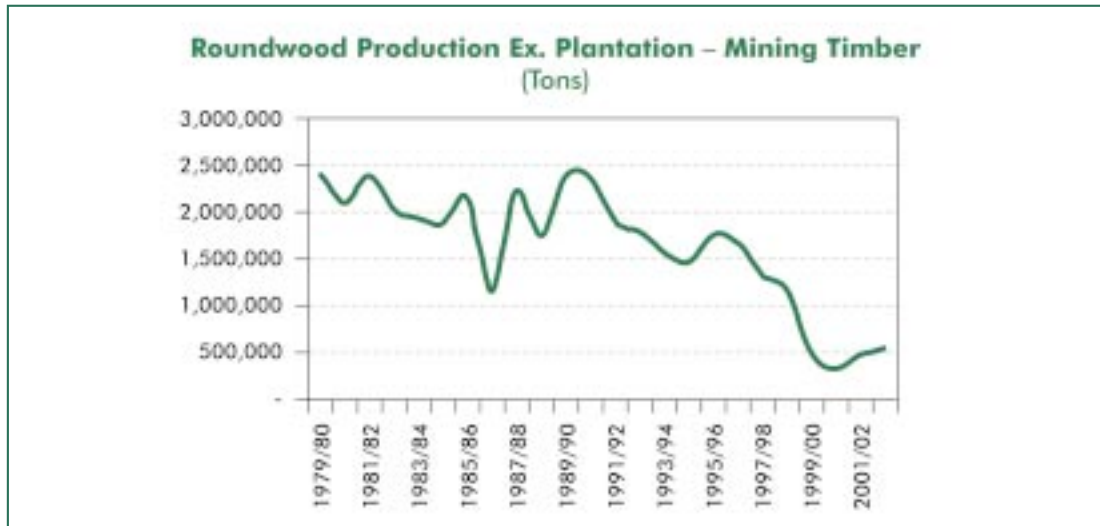
## 7.4.3 Chipping Plants

Chipping plants are running at capacity with the NCT Durban Wood Chips plant expected to achieve 120,000 tons in 2004 compared to the full capacity of 350,000 tons per annum, which is expected to be achieved in 2005. No allowance for growth other than Durban Chipping Company has been made. No allowance has been made for the planned chipping plant in Maputo nor the chipping plant at Richards Bay for which an Environmental Impact Assessment has been completed.

#### 7.4.4 Mining Timber

Mining timber demand has declined from 2,399,914 tons in 1979/ 1980 to the current 559,345 tons per annum at the rate of 6.3% per annum over the past eleven years. It is likely that this decline will continue for the foreseeable future. Demand therefore has been reduced by 50,000 tons per annum to 600,000 tons by 2009, which has been retained for the rest of the study period.

Figure 6



(Table 29)

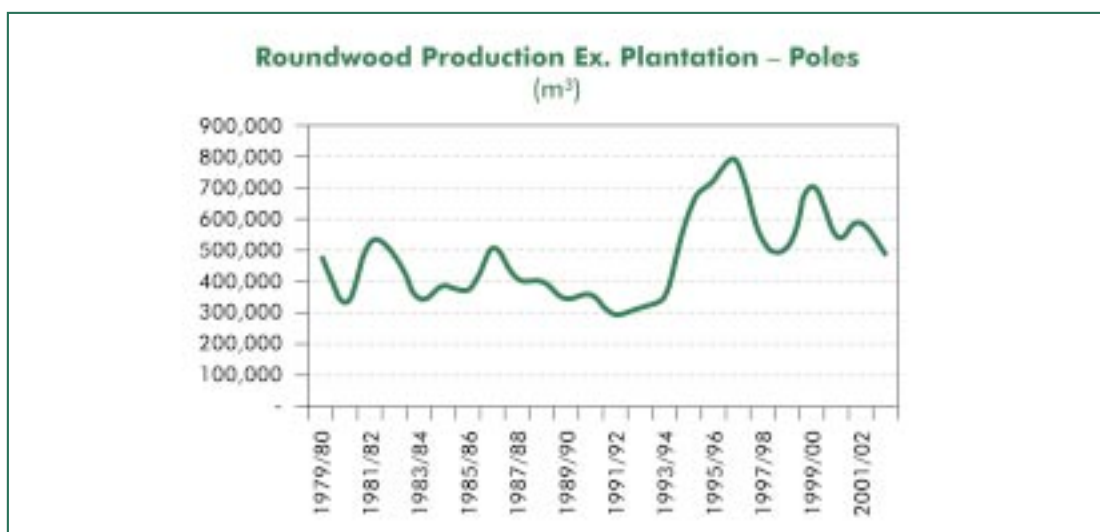
#### 7.4.5 Log Exports

Log exports in 2004 were made up of 260,000 tons of Pine sawlogs and 300,000 tons of Eucalypt pulpwood (total 560,000 tons). This is likely to terminate altogether over the next year, depending upon the value of the Rand, therefore has not been included in the study.

#### 7.4.6 Poles

The current levels of poles purchased for treating is 762,000 m<sup>3</sup> per annum. Although SAWPA believe that this will increase at the rate of 1.7% per annum this has not been done in order not to confuse the growth scenarios of zero, two, three and four percent overall rates of growth shown in Tables 30 and 32.

Figure 7



(Table 29)

The historical demand for poles has been as follows:

TABLE 23

TYPE	1996		1997		1998		1999		2000		2001		2002		2003		Ave- rage	
	Pine	Gum	Pine	Gum	Pine	Gum	Pine	Gum	Pine	Gum	Pine	Gum	Pine	Gum	Pine	Gum	Pine	Gum
Transmission	74	50	69	50	69	53	72	56	66	60	68	78	76	87	71	81	71	64
Telephone	23	24	21	30	20	33	22	36	18	31	13	20	15	22	19	16	19	27
Other	124	181	124	188	122	168	132	208	122	170	108	221	121	224	131	215	123	197
<b>TOTAL</b>	<b>221</b>	<b>255</b>	<b>214</b>	<b>268</b>	<b>211</b>	<b>254</b>	<b>226</b>	<b>300</b>	<b>206</b>	<b>261</b>	<b>189</b>	<b>319</b>	<b>212</b>	<b>333</b>	<b>221</b>	<b>312</b>	<b>213</b>	<b>288</b>

**NOTE**

In order to establish the roundwood intake a recovery factor of 70% has been used and the volumes converted to tons for this study.

SOURCE: SAWPA

For the purpose of the demand projections given later in this report, the cubic metres have been converted to tons.

### 7.4.7 Charcoal Timber

It is difficult to establish how much the charcoal demand has grown because many of the operators are small and their production may not have been recorded. It is thought, however, in terms of roundwood intake, that approximately 540,000 tons per annum are being used which yield 90,000 tons of charcoal (Louis Heyl & Associates' estimate is almost double this based on a conversion ratio of 10 : 1 compared to 6 : 1 used in this study).

The greatest single user is Silicon Smelters in Polokwane, who account for almost 20% of the total production with some of the charcoal being sourced from Zimbabwe.

The new Carbotek plant based at Estcourt in KwaZulu-Natal is currently using 50,000 tons of *E.macarthurii* per annum at present but would like to quadruple this production.

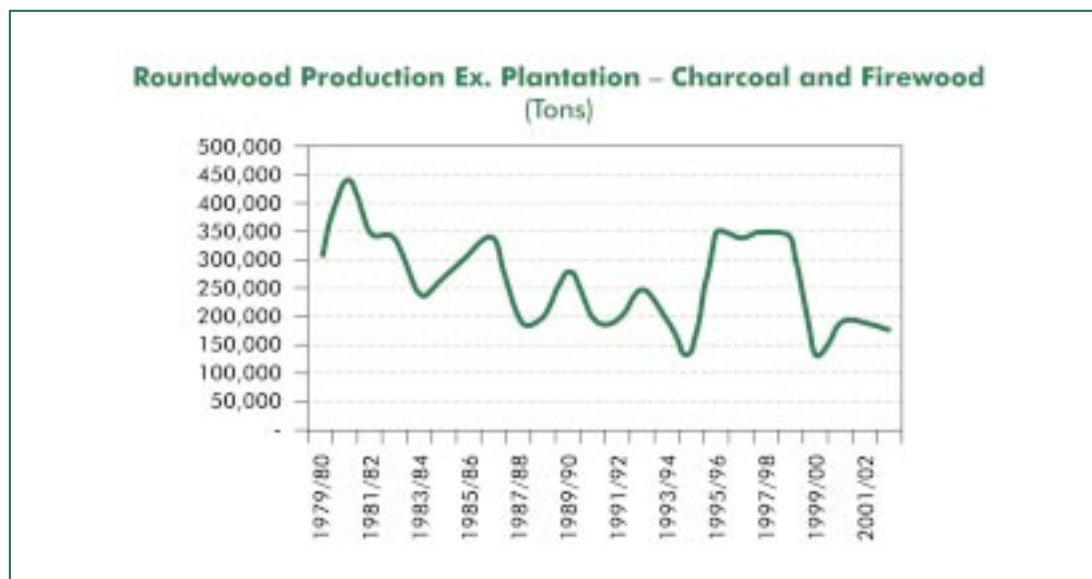
The proportion of charcoal exported, either in briquette or in lump form, is affected by the exchange rate but on average accounts for 20% to 40% of the total annual production.

The trend of consumption of roundwood for charcoal manufacture has been negative at the rate of 2.4% per annum. However, for future projections the annual consumption has been assumed to be constant.

An unknown but substantial proportion of the intake is derived from unregistered plantations which accounts for some of the differences. It should be noted however, that an allowance has been made for 500,000 tons additional supply of roundwood as a result of a possible under recording of 3.5% of productive area (Para 4.0).

LHA have undertaken an extensive study into the charcoal industry and their estimate of consumption is approximately twice that of ours at 1 million tons per annum.

Figure 8



(Table 29)

#### 7.4.8 Summary of Known Adjustments

- Merebank will scale-down to 485,000 tons in 2005.
- NCT chipping plant in Durban will scale-up to 350,000 tons (capacity 420,000 tons) in 2005.
- P G Bison at Piet Retief is likely to phase out of Eucalypts into Pine and increase capacity.
- Mondi at Richards Bay expect to commission their expansion of at least 600,000 tons of Eucalypt in 2005.
- SAICCOR expansion of 200,000 tons is expected to be commissioned in 2005.
- Supplies from Swaziland could change from 25,000 tons of Pine pulp logs and 20,000 tons of Eucalypts.
- Swaziland Peak Timbers will phase over to Eucalypts.
- It is very likely that a further chipboard plant will be installed near Mthatha which will use 100,000 tons of Pine with 40% chips.
- The chipping plant in Durban, known as NCT Durban Wood Chips has been commissioned.
- NCT's partnership with Södra in a pulpmill at Richards Bay known as Pulp United (Pty) Ltd is due to commence in 2007 and will have an intake of 450,000 tons of Eucalypt per annum.
- No account has been taken of the new chipping plant at Richards Bay for which an Environmental Impact Assessment has already been done.
- Nor has account been taken of the possibility of a chipping plant being installed at Maputo which would draw supplies from South Africa initially.

## 8. SUPPLY AND DEMAND PROJECTIONS FOR ROUNDWOOD OTHER THAN SAWLOGS

The projected supply of timber both in log form as well as in the form of chips and waste is reasonably predictable despite some inaccuracies in the base data. The prediction of demand however is considerably more complex. The known and expected increases in capacity are dealt with in Para 7.4.

In this section all commodities have been projected forward based on the assumption that there will be no increase in capacity other than those that have already been pointed out or are known (Section 7).

This projection shows that there will be a shortfall of:

**TABLE 24 – All Genera**

FIVE YEAR PERIOD	TOTAL SUPPLY (tons)	TOTAL DEMAND (tons)	SHORTFALL (%)
2005 – 2009	15,791,800	17,181,400	8.1
2010 – 2014	14,544,400	17,205,000	15.5
2015 – 2019	12,371,300	17,205,000	28.1
2020 – 2024	12,681,300	17,205,000	26.3
2025 – 2029	12,731,600	17,205,000	26.0
2030 – 2034	12,941,900	17,205,000	24.8

The most serious shortage occurs in the Eucalypt as follows:

**TABLE 25 – Eucalypt**

FIVE YEAR PERIOD	TOTAL SUPPLY (tons)	TOTAL DEMAND (tons)	SHORTFALL (%)
2005 – 2009	9,963,574	12,272,400	18.8
2010 – 2014	9,376,974	12,340,000	24.0
2015 – 2019	8,050,747	12,340,000	34.8
2020 – 2024	8,597,568	12,340,000	30.3
2025 – 2029	7,143,001	12,340,000	42.1
2030 – 2034	8,728,321	12,340,000	29.3

Pine supply looks more encouraging as follows:

**TABLE 26 – Pine**

FIVE YEAR PERIOD	TOTAL SUPPLY (tons)	TOTAL DEMAND (tons)	SURPLUS (+)/SHORTFALL (%)
2005 – 2009	4,576,051	3,266,000	+40.1
2010 – 2014	4,225,485	3,242,000	+30.3
2015 – 2019	3,116,840	3,242,000	3.9
2020 – 2024	3,197,740	3,242,000	1.4
2025 – 2029	4,441,426	3,242,000	+37.0
2030 – 2034	3,372,768	3,242,000	+4.0

The Wattle shortage is as follows:

TABLE 27 – Wattle

FIVE YEAR PERIOD	TOTAL SUPPLY (tons)	TOTAL DEMAND (tons)	SHORTFALL (%)
2005 – 2009	1,252,124	1,643,000	23.8
2010 – 2014	941,921	1,623,000	42.0
2015 – 2019	1,203,738	1,623,000	25.8
2020 – 2024	886,027	1,623,000	45.4
2025 – 2029	1,147,182	1,623,000	29.3
2030 – 2034	840,782	1,623,000	48.2

If the chip exports of 5.1 million tons were to be used internally in part or in total, it would go a long way to closing the gap between overall supply and demand.

For detail see Appendix O.

## 9. TOTAL SUPPLY AND DEMAND OF ALL ROUNDWOOD INCLUDING SAWLOGS

In order to complete this study the sawlogs, which have been excluded to this point, have been introduced and information has been drawn from the Supply and Demand Study of Softwood Sawlog and Sawn Timber in South Africa.

### 9.1 SOFTWOOD SAWLOGS

Softwood sawn timber will be in such short supply that sawmillers are likely to adapt their sawmills to cut smallwood. This inevitably will mean that millers will have to pay more for small logs in order to attract logs away from pulp. As indicated elsewhere, sawmillers could initially draw off 500,000 tons of smallwood from pulpwood.

### 9.2 EUCALYPT SAWLOGS

Commercial hardwood sawmilling is confined to Eucalyptus comprising mainly "Saligna" (*E.grandis*) which has not been subject to a specific supply and demand study. The reasons for this are that sawmilling "Saligna" is highly technical and capital intensive requiring high quality sawlogs all of which contribute to making the "Saligna" lumber barely competitive with the imports of Meranti, its main competitor. Furthermore with increased demand for short rotation *E.grandis* by pulpmills, the reduced production of longer rotation "Saligna" sawlogs will not allow for sawmilling of "Saligna" to expand to any great extent. The growth into "Saligna" sawmilling is therefore likely to be very modest.

"Saligna" sawlog consumption at 184,000 tons per annum has been included in the overall demand forecast.

9.3 The summary of supply and demand including softwood and hardwood sawlogs, is as follows:

TABLE 28

YEAR	TOTAL SUPPLY (tons)	TOTAL DEMAND (tons)	ANNUAL BALANCE (tons)	ANNUAL BALANCE (%)	PINE SAWLOG DEMAND ALREADY INCLUDED IN TOTAL DEMAND (tons)
2005	19,753,709	23,016,840	-3,263,132	-14.18	5,594,840
2006	19,981,706	23,121,388	-3,139,682	-13.58	5,749,388
2007	20,459,587	23,049,048	-2,589,461	-11.23	5,907,048
2008	21,673,849	23,571,894	-1,898,044	-8.05	6,069,894
2009	20,884,952	23,486,899	-2,601,947	-11.08	6,097,899
2010	21,284,030	23,639,372	-2,355,342	-9.96	6,250,372
2011	19,579,406	23,795,995	-4,216,589	-17.72	6,406,995
2012	19,004,142	23,955,729	-4,951,587	-20.67	6,566,729
2013	19,097,739	24,119,612	-5,021,873	-20.82	6,730,612
2014	21,470,676	24,153,840	-2,683,164	-11.11	6,764,840
2015	19,203,591	24,323,947	-5,120,356	-21.05	6,934,947
2016	17,633,077	24,497,165	-6,864,088	-28.02	7,108,165
2017	19,183,352	24,674,532	-5,491,180	-22.25	7,285,532
2018	18,297,543	24,857,085	-6,559,542	-26.39	7,468,085
2019	18,732,094	24,897,537	-6,165,443	-24.76	7,508,537
2020	19,133,006	25,085,277	-5,952,271	-23.73	7,696,277
2021	17,158,739	25,278,202	-8,119,463	-32.12	7,889,202
2022	17,911,727	25,475,277	-7,563,549	-29.69	8,086,277
2023	23,181,363	25,677,537	-2,496,174	-9.72	8,288,537
2024	19,886,946	25,726,287	-5,839,341	-22.70	8,337,287
2025	19,787,942	25,934,771	-6,146,829	-23.70	8,545,771
2026	20,416,349	26,148,441	-5,732,093	-21.92	8,759,441
2027	18,606,470	26,367,298	-7,760,828	-29.43	8,978,298
2028	17,974,879	26,592,378	-8,617,498	-32.41	9,203,378
2029	16,546,018	26,821,606	-10,275,588	-38.31	9,432,606
2030	18,007,890	27,058,096	-9,050,206	-33.45	9,669,096
2031	17,782,877	27,299,771	-9,516,895	-34.86	9,910,771
2032	20,950,496	27,547,670	-6,597,175	-23.95	10,158,670
2033	17,334,595	27,800,755	-10,466,161	-37.65	10,411,755
2034	16,597,648	27,800,755	-11,203,107	-40.30	10,411,755
<b>AVERAGE</b>	<b>19,250,547</b>	<b>25,192,500</b>	<b>-5,941,954</b>	<b>-23.16</b>	<b>7,807,434</b>

**NOTES:**

- a) Waste, chips and imports have not been included in Table 28 because the logs from which they were derived have been included.
- b) In order to test the forecast against historical supply, Table 29 is relevant, as 21.7 million tons were used and the projection estimates with new capacity will rise to 23.0 million tons.
- c) The sawlog forecast in Table 26 of the Supply and Demand Study of Softwood Sawlog and Sawn Timber in South Africa (Appendix P) has been adjusted downwards by removing the 2.5% growth and converting it to tons.

## 9.4 RECONCILIATION OF PAST PERFORMANCE WITH FORECASTS

Table 29 tracks the consumption of all roundwood including sawlogs and is expressed in tons.

TABLE 29

PRODUCT	YEAR											
	1992/ 93	1993/ 94	1994/ 95	1995/ 96	1996/ 97	1997/ 98	1998/ 99	1999/ 00	2000/ 01	2001/ 02	2002/ 03	2003/ 04
	m <sup>3</sup> /Tons											
SAWLOGS & VENEER LOGS	4,577,770	4,377,969	5,431,973	6,060,282	6,452,329	4,650,769	4,931,629	4,733,556	4,818,783	4,684,028	5,570,047	5,250,000
PULPWOOD	6,999,382	8,453,087	7,457,873	7,088,645	7,164,107	6,727,382	6,948,674	8,773,337	8,855,512	8,684,073	10,093,163	14,800,000
MINING TIMBER	1,779,639	1,554,565	1,466,095	1,751,308	1,660,225	1,308,540	1,162,611	498,762	332,983	496,423	559,345	829,000
POLES	217,108	242,918	423,924	493,670	533,555	358,897	345,933	484,067	370,679	402,952	331,856	762,000
MATCHWOOD	9,838	13,937	19,142	21,159	18,368	31,408	12,661	n/a	-	n/a	n/a	n/a
CHARCOAL & FIREWOOD	247,119	191,607	137,696	344,427	335,647	348,348	333,120	135,179	188,950	185,528	173,921	29,000
OTHER	65,021	100,092	101,857	315,309	307,374	265,793	267,126	114,439	89,830	87,789	103,942	-
<b>TOTAL</b>	<b>13,895,877</b>	<b>14,934,175</b>	<b>15,038,561</b>	<b>16,074,800</b>	<b>16,471,605</b>	<b>13,691,137</b>	<b>14,001,754</b>	<b>14,739,341</b>	<b>14,656,737</b>	<b>14,540,793</b>	<b>16,832,274</b>	<b>21,670,000</b>

Source: Forestry South Africa

## 9.5 THE CHANGES THAT HAVE OCCURRED TO SUPPLY THE MARKET

- The average age of Pine sawlogs has declined from 14.14 years in 1983 to 11.25 years in 2003, which illustrates how over-felling has dug into the reserves. The over-felling continues today.
- It is accepted that the registered Wattle plantations can only supply at best 1.0 million tons per annum, but at the peak demand 1.6 million tons were used. Wattle jungles in the Eastern Cape as well as KwaZulu-Natal and Swaziland were exploited to make up the deficit but that volume is not sustainable.
- Pulpwood production remained relatively static from 1992 until 1999 as can be seen in Table 29. As Eucalypts account for approximately two thirds of the pulpwood consumed and the demand for mining timber (almost entirely made up of Eucalypts) declined from 1.8 million tons to 0.56 million tons, a surplus of Eucalypts arose. As a result the average age of Eucalypts rose from 5.57 years to 6.09 years from 1991/1992 to 2001/2002. It is this build up that eases the shortage in the first seven to ten years of the study period.

As a result of the above, the plantations have been able to meet the increase in demand to 23.2 million tons per annum. However, the surplus Eucalypt yield and Wattle jungle area have been so diminished, as well as the clearfelling age of Pine for sawlogs having been reduced to a minimum, that the plantations will be able to sustain only 19.8 million tons per annum (Appendix O).

## 10. SENSITIVITY ANALYSES

This section endeavours to provide allowances for some of the imponderables in the form of different scenarios thereby converting the 'forecasts' produced in this report to this point, into 'projections'.

### 10.1 DEMAND

The real growth in the RSA has been approximately 2% p.a. Confidence however is growing and could exceed this and we have therefore used the levels used by Louis Heyl & Associates as follows:

- 2% Conservative
- 3% Average
- 4% Optimistic

There is likely to be considerable interchanging of roundwood between the sectors, some of the more important being:

- The export of 5.1 million tons of chips is likely to be substantially reduced or terminated altogether in favour of supplying the local pulpmills.
- Up to 500,000 tons of Pine pulpwood is likely to be sawn into lumber to supply the local market.
- Board products are likely to draw pulpwood and chips away from pulpmills, but will also increase their efforts to use waste wood.

In view of the introduction of growth the shortages are projected to rise from 3.3 million tons per annum or 14.2% (Table 30) to about 11.2 million tons or 40.3%.

TABLE 30

Annual Average	Total Supply (tons)	SCENARIO 1			SCENARIO 2			SCENARIO 3		
		Total Demand (tons) 2% p.a. - conservative	Annual Balance (tons)	Annual Balance (%)	Total Demand (tons) 3% p.a. - average	Annual Balance (tons)	Annual Balance (%)	Total Demand (tons) 4% p.a. - optimistic	Annual Balance (tons)	Annual Balance (%)
2005 - 2009	21,071,111	24,188,482	-3,117,371	-12.89	24,665,091	-3,593,980	-14.57	25,146,350	-4,075,239	-16.21
2010 - 2014	20,550,899	26,423,866	-5,872,967	-22.23	27,744,802	-7,193,902	-25.93	29,118,044	-8,567,145	-29.42
2015 - 2019	18,999,286	27,215,651	-8,216,364	-30.19	28,576,168	-9,576,881	-33.51	29,990,559	-10,991,272	-36.65
2020 - 2024	19,984,481	28,097,218	-8,112,737	-28.87	29,501,805	-9,517,324	-32.26	30,962,011	-10,977,530	-35.45
2025 - 2029	19,384,983	29,117,811	-9,732,828	-33.43	30,573,418	-11,188,435	-36.60	32,086,664	-12,701,681	-39.59
2030 - 2034	18,781,930	30,363,778	-11,581,849	-38.14	31,881,671	-13,099,741	-41.09	33,459,670	-14,677,740	-43.87
Equivalent Area Required (hectares)			721,835			816,437			914,786	

**NOTE:** Mean Annual Increment used of 16.045 tons/ha/annum shown in Appendix F to determine area.

## 10.2 SUPPLY

Modifications to the Pulpwood Study to produce scenarios four, five and six (Table 32) are as follows:

- Allowance for improved yields as a result of genetic and silvicultural advancement in the future:
 

Pine	3%
Eucalypts	6%
Wattle	6%
- Modifications in the provision for fire and weather losses in para 4.8 to allow for the increased fire damage recorded over the recent past. New percentages applied:
 

Pine	2.6% p.a. (was 1.8% p.a.)
Hardwoods	1.9% p.a. (was 1.4% p.a.)
- Adjustment to the allowance for environmental compliance:

TABLE 31

PREVIOUS ALLOWANCES		NEW ALLOWANCES	
First Rotation/ 15 year period	Second Rotation/ 15 year period	First Rotation/ 15 year period	Second Rotation/ 15 year period
5%	5%	5%	2.5%

- 500,000 tons have been included per annum to account for the possible 3.5% not recorded in the Commercial Timber Resources and Primary Roundwood Processing in South Africa annual report (Para 4).

## 10.3 OTHER FACTORS THAT COULD INFLUENCE THE FORECASTS

- The exchange rate which will depress exports and encourage imports of finished products as well as roundwood and chips.
- The effect that a recession in any of the major countries would have on global markets.
- The effect that accelerated global warming could have on plantations.
- The effect that serious outbreaks of insect pests or disease would have on the plantations.
- The effect that improved technology could have on conserving the resource.
- The effect of substitution and particularly replacement of timber with steel in construction.

It makes good sense to expand the plantations by 785,275 ha at least, which would increase the numbers employed by 72,300 thereby benefiting 289,200 people. This would also increase the country's earnings by about R10.4 billion.

TABLE 32

Annual Average	Total Supply (tons)	SCENARIO 4			SCENARIO 5			SCENARIO 6		
		Total Demand (tons) 2% p.a. - conservative	Annual Balance (tons)	Annual Balance (%)	Total Demand (tons) 3% p.a. - average	Annual Balance (tons)	Annual Balance (%)	Total Demand (tons) 4% p.a. - optimistic	Annual Balance (tons)	Annual Balance (%)
2005 - 2009	21,571,111	24,188,482	-2,617,371	-10.82	24,665,091	-3,093,980	-12.54	25,146,350	-3,575,239	-14.22
2010 - 2014	21,050,899	26,423,866	-5,372,967	-20.33	27,744,802	-6,693,902	-24.13	29,118,044	-8,067,145	-27.70
2015 - 2019	19,499,286	27,215,651	-7,716,364	-28.35	28,576,168	-9,076,881	-31.76	29,990,559	-10,491,272	-34.98
2020 - 2024	20,484,481	28,097,218	-7,612,737	-27.09	29,501,805	-9,017,324	-30.57	30,962,011	-10,477,530	-33.84
2025 - 2029	19,884,983	29,117,811	-9,232,828	-31.71	30,573,418	-10,688,435	-34.96	32,086,664	-12,201,681	-38.03
2030 - 2034	19,281,930	30,363,778	-11,081,849	-36.50	31,881,671	-12,599,741	-39.52	33,459,670	-14,177,740	-42.37
Equivalent Area Required (hectares)			690,673			785,275			883,623	

**NOTE:** The percentage allowance for the growth scenarios commences only in 2008, i.e. after the major expansion.

We are of the opinion that of all these scenarios, Scenario 5 would be the most realistic one to use. The total shortage would rise from 3,093,980 tons per annum in 2005 – 2009 (12.5% shortage) to 12,599,741 tons per annum or a 39.52% shortage at the end of the window period (2034).



YEAR	FORECAST OF ROUNDWOOD OTHER THAN SAWLOGS IN TONS: LIMPOPO: 2005 - 2034										TONS Total Forecast (Rounded to 100)
	TONS										
	Pine (1.00)	E. grandis (1.37)	Other Eucalypts (1.16)	Wattle (1.138)	Wattle Jungle (1.138)	Total Wattle	Total Hardwoods	% Reduction for Fires and Other Factors: Softwood	% Reduction for Fires and Other Factors: Hardwoods		
2005-06	53,947	354,513	371,372	-	-	-	725,886	1.8%	2.5%	760,500	
2006-07	64,174	327,292	269,513	-	-	-	596,805	1.8%	2.5%	644,800	
2007-08	56,118	349,077	248,361	-	-	-	597,438	1.8%	2.5%	637,500	
2008-09	93,049	358,909	271,132	-	-	-	630,041	1.8%	2.5%	705,500	
2009-10	82,702	320,930	224,659	-	-	-	545,588	1.8%	2.5%	613,000	
<b>Annual Average: 2005 - 2009</b>	<b>69,998</b>	<b>342,144</b>	<b>277,007</b>	-	-	-	<b>619,152</b>	<b>1.8%</b>	<b>2.5%</b>	<b>672,300</b>	
2010-11	54,562	314,021	224,659	-	-	-	538,679	1.8%	2.5%	578,700	
2011-12	52,489	308,706	224,659	-	-	-	533,365	1.8%	2.5%	571,400	
2012-13	53,796	306,651	224,659	-	-	-	531,309	1.8%	2.5%	570,700	
2013-14	63,258	311,222	224,659	-	-	-	535,881	1.8%	2.5%	584,500	
2014-15	58,241	376,140	444,432	-	-	-	820,572	1.8%	2.5%	857,000	
<b>Annual Average: 2010 - 2014</b>	<b>56,469</b>	<b>323,348</b>	<b>268,613</b>	-	-	-	<b>591,961</b>	<b>1.8%</b>	<b>2.5%</b>	<b>632,500</b>	
2015-16	36,263	235,849	226,887	-	-	-	462,736	1.8%	2.5%	486,700	
2016-17	32,775	258,433	205,735	-	-	-	464,168	1.8%	2.5%	484,600	
2017-18	32,890	284,996	228,506	-	-	-	513,502	1.8%	2.5%	532,800	
2018-19	34,291	249,154	182,033	-	-	-	431,187	1.8%	2.5%	454,000	
2019-20	39,033	251,853	182,033	-	-	-	433,886	1.8%	2.5%	461,300	
<b>Annual Average: 2015 - 2019</b>	<b>35,051</b>	<b>256,057</b>	<b>205,039</b>	-	-	-	<b>461,096</b>	<b>1.8%</b>	<b>2.5%</b>	<b>483,900</b>	
2020-21	25,993	264,631	182,033	-	-	-	446,664	1.8%	2.5%	460,900	
2021-22	30,717	276,185	198,391	-	-	-	474,576	1.8%	2.5%	492,800	
2022-23	28,299	275,967	198,391	-	-	-	474,358	1.8%	2.5%	490,200	
2023-24	51,423	371,624	428,074	-	-	-	799,698	1.8%	2.5%	830,000	
2024-25	37,941	254,512	210,528	-	-	-	465,041	1.8%	2.5%	490,600	
<b>Annual Average: 2020 - 2024</b>	<b>34,874</b>	<b>288,584</b>	<b>243,483</b>	-	-	-	<b>532,067</b>	<b>1.8%</b>	<b>2.5%</b>	<b>552,900</b>	
2025-26	23,777	265,954	189,377	-	-	-	455,331	1.8%	2.5%	467,200	
2026-27	46,573	295,921	212,148	-	-	-	508,069	1.8%	2.5%	541,000	
2027-28	28,080	247,115	165,674	-	-	-	412,789	1.8%	2.5%	429,900	
2028-29	21,520	252,595	165,674	-	-	-	418,269	1.8%	2.5%	428,800	
2029-30	51,961	247,349	165,674	-	-	-	413,023	1.8%	2.5%	453,600	
<b>Annual Average: 2025 - 2029</b>	<b>34,382</b>	<b>261,787</b>	<b>179,709</b>	-	-	-	<b>441,496</b>	<b>1.8%</b>	<b>2.5%</b>	<b>464,100</b>	
2030-31	42,725	284,685	198,391	-	-	-	483,076	1.8%	2.5%	512,800	
2031-32	90,779	284,095	198,391	-	-	-	482,486	1.8%	2.5%	559,400	
2032-33	52,176	385,937	428,074	-	-	-	814,011	1.8%	2.5%	844,700	
2033-34	40,022	242,500	210,528	-	-	-	453,028	1.8%	2.5%	480,900	
2034-35	45,084	256,117	189,377	-	-	-	445,494	1.8%	2.5%	478,500	
<b>Annual Average: 2030 - 2034</b>	<b>54,157</b>	<b>290,667</b>	<b>244,952</b>	-	-	-	<b>535,619</b>	<b>1.8%</b>	<b>2.5%</b>	<b>575,300</b>	
<b>Annual Average: 2005 - 2034</b>	<b>47,489</b>	<b>293,765</b>	<b>236,467</b>	-	-	-	<b>530,232</b>	<b>1.8%</b>	<b>2.5%</b>	<b>563,500</b>	

Logs included are those of pulpwood dimensions only from each timber type and therefore includes by-products from the sawlog production operations.  
30% of Class A logs from Pine sawtimber compartments (thinnings and clearfellings) were assumed to be pulpwood.

Pulpwood conversion ratios, m<sup>3</sup> to tons, are given in brackets.

Wattle regions were based on Extract Factory or Collection Depot location.

Wattle Jungle forecasts are based on: Mpumalanga South: 23,100 ha @ 3 tons/ha/annum, Northern KZNatal: 6,000 ha @ 3 tons/ha/annum and Eastern Cape: 18,000 ha @ 3 tons/ha/annum for one rotation and 10,000 ha @ 5 tons/ha/annum thereafter.

Mpumalanga South/Central Districts (Combined) includes both Regions' data, Zululand (Combined) includes Maputaland, Zululand and Northern KwaZulu-Natal Regions.

Some smoothing was applied to Pine and Eucalypt clearfelling areas in order to even out yields realistically.

YEAR	FORECAST OF ROUNDWOOD OTHER THAN SAWLOGS IN TONS: MPUMALANGA NORTH: 2005 - 2034											TONS	
	TONS											% Reduction for Fires and Other Factors: Hardwoods	Total Forecast (Rounded to 100)
	Pine (1.00)	E. grandis (1.37)	Other Eucalypts (1.16)	Wattle (1.138)	Wattle Jungle (1.138)	Total Wattle	Total Hardwoods	% Reduction for Fires and Other Factors: Softwood	% Reduction for Fires and Other Factors: Hardwoods	Total Forecast (Rounded to 100)			
2005-06	791,721	1,357,250	398,399	-	-	-	1,755,649	0.9%	2.3%	2,500,800			
2006-07	748,882	1,190,071	623,999	-	-	-	1,814,069	0.9%	2.3%	2,515,500			
2007-08	803,000	1,190,050	612,030	-	-	-	1,802,080	0.9%	2.3%	2,557,400			
2008-09	861,208	1,263,204	373,671	-	-	-	1,636,875	0.9%	2.3%	2,453,600			
2009-10	750,698	1,224,636	257,285	-	-	-	1,481,921	0.9%	2.3%	2,192,600			
<b>Annual Average: 2005 - 2009</b>	<b>791,102</b>	<b>1,245,042</b>	<b>453,077</b>	-	-	-	<b>1,698,119</b>	<b>0.9%</b>	<b>2.3%</b>	<b>2,444,000</b>			
2010-11	848,331	1,216,599	257,285	-	-	-	1,473,884	0.9%	2.3%	2,281,500			
2011-12	717,278	1,212,932	257,285	-	-	-	1,470,217	0.9%	2.3%	2,148,100			
2012-13	886,865	1,208,790	257,285	-	-	-	1,466,075	0.9%	2.3%	2,312,100			
2013-14	771,990	1,215,188	257,285	-	-	-	1,472,472	0.9%	2.3%	2,204,500			
2014-15	559,817	1,339,261	338,156	-	-	-	1,677,417	0.9%	2.3%	2,194,500			
<b>Annual Average: 2010 - 2014</b>	<b>756,856</b>	<b>1,238,554</b>	<b>273,459</b>	-	-	-	<b>1,512,013</b>	<b>0.9%</b>	<b>2.3%</b>	<b>2,228,100</b>			
2015-16	570,983	913,583	565,994	-	-	-	1,479,577	0.9%	2.3%	2,012,200			
2016-17	537,750	904,803	554,025	-	-	-	1,458,828	0.9%	2.3%	1,959,000			
2017-18	547,114	997,782	315,666	-	-	-	1,313,448	0.9%	2.3%	1,826,200			
2018-19	550,456	961,238	199,280	-	-	-	1,160,518	0.9%	2.3%	1,680,000			
2019-20	566,820	963,608	199,280	-	-	-	1,162,888	0.9%	2.3%	1,698,500			
<b>Annual Average: 2015 - 2019</b>	<b>554,625</b>	<b>948,203</b>	<b>366,849</b>	-	-	-	<b>1,315,052</b>	<b>0.9%</b>	<b>2.3%</b>	<b>1,835,200</b>			
2020-21	593,877	965,262	199,280	-	-	-	1,164,542	0.9%	2.3%	1,726,900			
2021-22	545,574	1,038,819	221,762	-	-	-	1,260,581	0.9%	2.3%	1,773,000			
2022-23	587,222	1,043,139	221,762	-	-	-	1,264,901	0.9%	2.3%	1,818,500			
2023-24	807,801	1,272,475	315,674	-	-	-	1,588,150	0.9%	2.3%	2,353,100			
2024-25	703,234	869,648	543,512	-	-	-	1,413,160	0.9%	2.3%	2,078,400			
<b>Annual Average: 2020 - 2024</b>	<b>647,542</b>	<b>1,037,869</b>	<b>300,398</b>	-	-	-	<b>1,338,267</b>	<b>0.9%</b>	<b>2.3%</b>	<b>1,950,000</b>			
2025-26	722,060	865,140	531,544	-	-	-	1,396,683	0.9%	2.3%	2,080,900			
2026-27	752,882	963,023	293,184	-	-	-	1,256,208	0.9%	2.3%	1,974,100			
2027-28	675,660	904,870	176,798	-	-	-	1,081,668	0.9%	2.3%	1,727,000			
2028-29	810,943	898,266	176,798	-	-	-	1,075,065	0.9%	2.3%	1,854,600			
2029-30	685,306	905,470	176,798	-	-	-	1,082,269	0.9%	2.3%	1,737,100			
<b>Annual Average: 2025 - 2029</b>	<b>729,370</b>	<b>907,354</b>	<b>271,025</b>	-	-	-	<b>1,178,378</b>	<b>0.9%</b>	<b>2.3%</b>	<b>1,874,700</b>			
2030-31	898,301	1,044,757	221,762	-	-	-	1,266,519	0.9%	2.3%	2,128,400			
2031-32	791,587	1,040,550	221,762	-	-	-	1,262,312	0.9%	2.3%	2,018,500			
2032-33	564,713	1,283,555	315,674	-	-	-	1,599,229	0.9%	2.3%	2,122,900			
2033-34	561,342	861,102	543,512	-	-	-	1,404,615	0.9%	2.3%	1,929,400			
2034-35	537,455	854,047	531,544	-	-	-	1,385,590	0.9%	2.3%	1,887,100			
<b>Annual Average: 2030 - 2034</b>	<b>670,680</b>	<b>1,016,802</b>	<b>366,851</b>	-	-	-	<b>1,383,653</b>	<b>0.9%</b>	<b>2.3%</b>	<b>2,017,300</b>			
<b>Annual Average: 2005 - 2034</b>	<b>691,696</b>	<b>1,065,637</b>	<b>338,610</b>	-	-	-	<b>1,404,247</b>	<b>0.9%</b>	<b>2.3%</b>	<b>2,058,200</b>			

Logs included are those of pulpwood dimensions only from each timber type and therefore includes by-products from the sawlog production operations.  
30% of Class a logs from Pine sawtimber compartments (thinnings and clearfellings) were assumed to be pulpwood.  
Pulpwood conversion ratios, m<sup>3</sup> to tons, are given in brackets.

Wattle regions were based on Extract Factory or Collection Depot location.  
Wattle Jungle forecasts are based on: Mpumalanga South: 23,100 ha @ 3 tons/ha/annum, Northern KZNatal: 6,000 ha @ 3 tons/ha/annum and Eastern Cape: 18,000 ha @ 3 tons/ha/annum for one rotation and 10,000 ha @ 5 tons/ha/annum thereafter.

Mpumalanga South/Central Districts (Combined) includes both Regions' data, Zululand (Combined) includes Maputaland, Zululand and Northern KwaZulu-Natal Regions.  
Some smoothing was applied to Pine and Eucalypt clearfelling areas in order to even out yields realistically.

FORECAST OF ROUNDWOOD OTHER THAN SAWLOGS IN TONS: MPUMALANGA SOUTH/CENTRAL DISTRICTS(COMBINED): 2005 - 2034													
YEAR	TONS										% Reduction for Fires and Other Factors:		TONS Total Forecast (Rounded to 100)
	Pine (1.00)	E. grandis (1.37)	Other Eucalypts (1.16)	Wattle (1.138)	Wattle Jungle (1.138)	Total Wattle	Total Hardwoods	% Reduction for Fires and Other Factors: Softwood	% Reduction for Fires and Other Factors: Hardwoods				
2005-06	1,095,283	550,167	2,049,299	124,577	69,300	193,877	2,793,343	1.1%	1.0%	3,849,400			
2006-07	1,457,294	564,350	1,979,747	138,805	69,300	208,105	2,752,203	1.1%	1.0%	4,166,800			
2007-08	1,422,105	538,477	2,030,182	171,708	69,300	241,008	2,809,667	1.1%	1.0%	4,188,900			
2008-09	1,528,442	422,232	2,086,499	192,647	69,300	261,947	2,770,678	1.1%	1.0%	4,255,500			
2009-10	1,767,477	386,862	1,833,679	129,589	69,300	198,889	2,419,429	1.1%	1.0%	4,144,200			
<b>Annual Average: 2005 - 2009</b>	<b>1,454,120</b>	<b>492,418</b>	<b>1,995,881</b>	<b>151,465</b>	<b>69,300</b>	<b>220,765</b>	<b>2,709,062</b>	<b>1.1%</b>	<b>1.0%</b>	<b>4,121,000</b>			
2010-11	2,037,575	386,414	1,833,679	155,139	69,300	224,439	2,444,532	1.1%	1.0%	4,436,200			
2011-12	1,548,287	385,994	1,833,679	129,026	69,300	198,326	2,417,999	1.1%	1.0%	3,925,900			
2012-13	1,625,117	385,904	1,833,679	139,455	69,300	208,755	2,428,338	1.1%	1.0%	4,012,200			
2013-14	1,542,460	386,313	1,833,679	123,286	69,300	192,586	2,412,578	1.1%	1.0%	3,914,800			
2014-15	1,150,108	634,020	2,403,237	74,619	69,300	143,919	3,181,176	1.1%	1.0%	4,287,700			
<b>Annual Average: 2010 - 2014</b>	<b>1,580,710</b>	<b>435,729</b>	<b>1,947,590</b>	<b>124,305</b>	<b>69,300</b>	<b>193,605</b>	<b>2,576,924</b>	<b>1.1%</b>	<b>1.0%</b>	<b>4,115,400</b>			
2015-16	1,189,179	511,854	1,686,560	142,373	64,000	206,373	2,404,787	1.1%	1.0%	3,557,600			
2016-17	1,154,375	486,301	1,736,994	126,188	64,000	190,188	2,413,483	1.1%	1.0%	3,531,800			
2017-18	1,155,007	369,998	1,793,311	159,091	64,000	223,091	2,386,400	1.1%	1.0%	3,505,600			
2018-19	1,156,528	334,696	1,540,491	180,030	64,000	244,030	2,119,217	1.1%	1.0%	3,242,500			
2019-20	1,173,409	335,094	1,540,491	116,972	64,000	180,972	2,056,556	1.1%	1.0%	3,197,200			
<b>Annual Average: 2015 - 2019</b>	<b>1,165,700</b>	<b>407,589</b>	<b>1,659,569</b>	<b>144,931</b>	<b>64,000</b>	<b>208,931</b>	<b>2,276,089</b>	<b>1.1%</b>	<b>1.0%</b>	<b>3,406,900</b>			
2020-21	1,168,456	335,018	1,540,491	147,029	64,000	211,029	2,086,538	1.1%	1.0%	3,222,200			
2021-22	1,131,569	365,167	1,664,840	120,917	64,000	184,917	2,214,923	1.1%	1.0%	3,312,600			
2022-23	1,132,653	365,293	1,664,840	131,346	64,000	195,346	2,225,478	1.1%	1.0%	3,324,100			
2023-24	865,961	605,427	2,278,888	115,177	64,000	179,177	3,063,492	1.1%	1.0%	3,890,100			
2024-25	1,298,690	483,053	1,562,211	74,619	64,000	138,619	2,183,882	1.1%	1.0%	3,447,200			
<b>Annual Average: 2020 - 2024</b>	<b>1,119,466</b>	<b>430,791</b>	<b>1,742,254</b>	<b>117,817</b>	<b>64,000</b>	<b>181,817</b>	<b>2,354,863</b>	<b>1.1%</b>	<b>1.0%</b>	<b>3,439,200</b>			
2025-26	1,270,418	457,437	1,612,645	134,263	64,000	198,263	2,268,346	1.1%	1.0%	3,502,800			
2026-27	1,395,474	341,687	1,668,962	118,078	64,000	182,078	2,192,728	1.1%	1.0%	3,551,700			
2027-28	1,607,797	305,178	1,416,142	150,982	64,000	214,982	1,936,302	1.1%	1.0%	3,507,800			
2028-29	1,820,391	304,801	1,416,142	171,920	64,000	235,920	1,956,863	1.1%	1.0%	3,738,500			
2029-30	1,431,478	304,998	1,416,142	108,862	64,000	172,862	1,894,002	1.1%	1.0%	3,291,500			
<b>Annual Average: 2025 - 2029</b>	<b>1,505,111</b>	<b>342,820</b>	<b>1,506,007</b>	<b>136,821</b>	<b>64,000</b>	<b>200,821</b>	<b>2,049,648</b>	<b>1.1%</b>	<b>1.0%</b>	<b>3,518,500</b>			
2030-31	1,555,205	364,903	1,664,840	138,920	64,000	202,920	2,232,663	1.1%	1.0%	3,749,200			
2031-32	1,443,642	364,806	1,664,840	112,807	64,000	176,807	2,206,454	1.1%	1.0%	3,612,900			
2032-33	1,086,201	604,938	2,278,888	123,236	64,000	187,236	3,071,062	1.1%	1.0%	4,115,400			
2033-34	1,109,702	483,081	1,562,211	107,067	64,000	171,067	2,216,359	1.1%	1.0%	3,292,400			
2034-35	1,099,105	457,709	1,612,645	74,619	64,000	138,619	2,208,973	1.1%	1.0%	3,274,600			
<b>Annual Average: 2030 - 2034</b>	<b>1,258,771</b>	<b>455,088</b>	<b>1,756,685</b>	<b>111,330</b>	<b>64,000</b>	<b>175,330</b>	<b>2,387,102</b>	<b>1.1%</b>	<b>1.0%</b>	<b>3,608,900</b>			
<b>Annual Average: 2005 - 2034</b>	<b>1,347,313</b>	<b>427,406</b>	<b>1,767,998</b>	<b>131,112</b>	<b>65,767</b>	<b>196,878</b>	<b>2,392,282</b>	<b>1.1%</b>	<b>1.0%</b>	<b>3,701,600</b>			

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30% of Class a logs from Pine sawtimber compartments (thinnings and clearfellings) were assumed to be pulpwood.

Pulpwood conversion ratios, m<sup>3</sup> to tons, are given in brackets.

Wattle regions were based on Extract Factory or Collection Depot location.

Wattle Jungle forecasts are based on: Mpumalanga South: 23,100 ha @ 3 tons/ha/annum, Northern KZNatal: 6,000 ha @ 3 tons/ha/annum and Eastern Cape: 18,000 ha @ 3 tons/ha/annum for one rotation and 10,000 ha @ 5 tons/ha/annum thereafter.

Mpumalanga South/Central Districts (Combined) includes both Regions' data, Zululand (Combined) includes Maputaland, Zululand and Northern KwaZulu-Natal Regions.

Some smoothing was applied to Pine and Eucalypt clearfelling areas in order to even out yields realistically.

YEAR	FORECAST OF ROUNDWOOD OTHER THAN SAWLOGS IN TONS: ZULULAND (COMBINED): 2005 - 2034											TONS		
	TONS											% Reduction for Fires and Other Factors: Softwood	% Reduction for Fires and Other Factors: Hardwoods	Total Forecast (Rounded to 100)
	Pine (1.00)	E. grandis (1.37)	Other Eucalypts (1.16)	Wattle (1.138)	Wattle Jungle (1.138)	Total Wattle	Total Hardwoods	Total Wattle	Total Hardwoods	Total Wattle	Total Hardwoods			
2005-06	434,478	1,853,180	1,111,608	306,148	18,000	324,148	3,288,936	4.8%	1.4%	3,658,000				
2006-07	362,556	1,816,112	987,604	298,106	18,000	316,106	3,119,822	4.8%	1.4%	3,422,700				
2007-08	355,875	1,831,247	807,007	368,862	18,000	386,862	3,025,116	4.8%	1.4%	3,322,900				
2008-09	363,344	2,081,080	965,905	344,735	18,000	362,735	3,409,720	4.8%	1.4%	3,709,400				
2009-10	304,656	1,601,908	757,933	302,436	18,000	320,436	2,680,278	4.8%	1.4%	2,934,000				
<b>Annual Average: 2005 - 2009</b>	<b>364,182</b>	<b>1,836,705</b>	<b>926,011</b>	<b>324,057</b>	<b>18,000</b>	<b>342,057</b>	<b>3,104,774</b>	<b>4.8%</b>	<b>1.4%</b>	<b>3,409,400</b>				
2010-11	387,814	1,601,838	757,933	283,100	18,000	301,100	2,660,872	4.8%	1.4%	2,994,000				
2011-12	419,430	1,601,525	757,933	268,098	18,000	286,098	2,645,557	4.8%	1.4%	3,009,000				
2012-13	315,079	1,601,214	757,933	245,054	18,000	263,054	2,622,202	4.8%	1.4%	2,886,600				
2013-14	300,017	1,601,061	757,933	287,972	18,000	305,972	2,664,966	4.8%	1.4%	2,914,500				
2014-15	213,637	2,337,522	1,561,310	153,497	18,000	171,497	4,070,329	4.8%	1.4%	4,218,600				
<b>Annual Average: 2010 - 2014</b>	<b>327,196</b>	<b>1,748,632</b>	<b>918,609</b>	<b>247,544</b>	<b>18,000</b>	<b>265,544</b>	<b>2,932,785</b>	<b>4.8%</b>	<b>1.4%</b>	<b>3,204,500</b>				
2015-16	247,680	1,582,300	904,485	324,001	16,500	340,501	2,827,286	4.8%	1.4%	3,024,800				
2016-17	207,243	1,597,685	723,888	275,613	16,500	292,113	2,613,686	4.8%	1.4%	2,775,600				
2017-18	212,751	1,848,148	882,786	346,368	16,500	362,868	3,093,802	4.8%	1.4%	3,254,400				
2018-19	211,485	1,370,519	674,815	322,242	16,500	338,742	2,384,075	4.8%	1.4%	2,553,100				
2019-20	204,488	1,370,480	674,815	279,943	16,500	296,443	2,341,738	4.8%	1.4%	2,504,700				
<b>Annual Average: 2015 - 2019</b>	<b>216,729</b>	<b>1,553,826</b>	<b>772,158</b>	<b>309,633</b>	<b>16,500</b>	<b>326,133</b>	<b>2,652,117</b>	<b>4.8%</b>	<b>1.4%</b>	<b>2,822,500</b>				
2020-21	220,601	1,370,565	674,815	266,318	16,500	282,818	2,328,198	4.8%	1.4%	2,506,700				
2021-22	213,369	1,485,936	735,247	251,316	16,500	267,816	2,488,998	4.8%	1.4%	2,658,400				
2022-23	202,057	1,486,105	735,247	228,272	16,500	244,772	2,466,123	4.8%	1.4%	2,625,100				
2023-24	443,657	2,223,924	1,500,878	271,189	16,500	287,689	4,012,491	4.8%	1.4%	4,380,500				
2024-25	299,177	1,469,228	844,054	153,497	16,500	169,997	2,483,279	4.8%	1.4%	2,734,400				
<b>Annual Average: 2020 - 2024</b>	<b>275,772</b>	<b>1,607,152</b>	<b>898,048</b>	<b>234,118</b>	<b>16,500</b>	<b>250,618</b>	<b>2,755,818</b>	<b>4.8%</b>	<b>1.4%</b>	<b>2,981,000</b>				
2025-26	314,942	1,484,191	663,457	307,219	16,500	323,719	2,471,366	4.8%	1.4%	2,737,700				
2026-27	334,880	1,734,763	822,354	258,830	16,500	275,330	2,832,447	4.8%	1.4%	3,112,800				
2027-28	275,513	1,255,600	614,383	329,586	16,500	346,086	2,216,069	4.8%	1.4%	2,448,300				
2028-29	325,487	1,255,176	614,383	305,459	16,500	321,959	2,191,518	4.8%	1.4%	2,471,700				
2029-30	390,655	1,254,988	614,383	263,161	16,500	279,661	2,149,031	4.8%	1.4%	2,491,800				
<b>Annual Average: 2025 - 2029</b>	<b>328,295</b>	<b>1,396,944</b>	<b>665,792</b>	<b>292,851</b>	<b>16,500</b>	<b>309,351</b>	<b>2,372,086</b>	<b>4.8%</b>	<b>1.4%</b>	<b>2,652,500</b>				
2030-31	321,087	1,486,569	735,247	249,535	16,500	266,035	2,487,851	4.8%	1.4%	2,759,800				
2031-32	287,176	1,486,605	735,247	234,533	16,500	251,033	2,472,885	4.8%	1.4%	2,712,700				
2032-33	202,951	2,224,274	1,500,878	211,490	16,500	227,990	3,953,142	4.8%	1.4%	4,092,300				
2033-34	203,479	1,469,127	844,054	254,407	16,500	270,907	2,584,088	4.8%	1.4%	2,742,800				
2034-35	205,652	1,483,852	663,457	153,497	16,500	169,997	2,317,306	4.8%	1.4%	2,481,700				
<b>Annual Average: 2030 - 2034</b>	<b>243,949</b>	<b>1,630,086</b>	<b>895,776</b>	<b>220,693</b>	<b>16,500</b>	<b>237,193</b>	<b>2,763,054</b>	<b>4.8%</b>	<b>1.4%</b>	<b>2,957,900</b>				
<b>Annual Average: 2005 - 2034</b>	<b>292,687</b>	<b>1,628,891</b>	<b>846,066</b>	<b>271,483</b>	<b>17,000</b>	<b>288,483</b>	<b>2,763,439</b>	<b>4.8%</b>	<b>1.4%</b>	<b>3,004,600</b>				

Logs included are those of pulpwood dimensions only from each timber type and therefore includes by-products from the sawlog production operations.  
 30% of Class A logs from Pine sawtimber compartments (thinnings and clearfellings) were assumed to be pulpwood.  
 Pulpwood conversion ratios, m<sup>3</sup> to tons, are given in brackets.  
 Wattle regions were based on Extract Factory or Collection Depot location.  
 Wattle Jungle forecasts are based on: Mpumalanga South: 23,100 ha @ 3 tons/ha/annum, Northern KZNatal: 6,000 ha @ 3 tons/ha/annum and Eastern Cape: 18,000 ha @ 3 tons/ha/annum for one rotation and 10,000 ha @ 5 tons/ha/annum thereafter.  
 Mpumalanga South/Central Districts (Combined) includes both Regions' data, Zululand (Combined) includes Maputaland, Zululand and Northern KwaZulu-Natal Regions.  
 Some smoothing was applied to Pine and Eucalypt clearfelling areas in order to even out yields realistically.

YEAR	FORECAST OF ROUNDWOOD OTHER THAN SAWLOGS IN TONS: KZN MIDLANDS: 2005 - 2034										TONS		
	TONS										% Reduction for Fires and Other Factors: Softwood	% Reduction for Fires and Other Factors: Hardwoods	Total Forecast (Rounded to 100)
	Pine (1.00)	E. grandis (1.37)	Other Eucalypts (1.16)	Wattle (1.138)	Wattle Jungle (1.138)	Total Wattle	Total Hardwoods						
2005-06	630,498	792,274	822,066	642,202	-	642,202	2,256,543	1.5%	1.5%	2,843,400			
2006-07	740,108	845,647	681,066	659,631	-	659,631	2,186,344	1.5%	1.5%	2,882,400			
2007-08	1,050,091	836,271	528,024	528,187	-	672,187	2,036,481	1.5%	1.5%	3,040,000			
2008-09	1,211,555	776,552	520,039	585,951	-	585,951	1,882,542	1.5%	1.5%	3,047,500			
2009-10	1,297,797	705,177	477,868	514,419	-	514,419	1,697,463	1.5%	1.5%	2,950,200			
<b>Annual Average: 2005 - 2009</b>	<b>986,010</b>	<b>791,184</b>	<b>605,812</b>	<b>614,878</b>	-	<b>614,878</b>	<b>2,011,875</b>	<b>1.5%</b>	<b>1.5%</b>	<b>2,952,660</b>			
2010-11	1,163,536	704,715	477,868	492,550	-	492,550	1,675,133	1.5%	1.5%	2,795,900			
2011-12	695,240	704,345	477,868	439,851	-	439,851	1,622,063	1.5%	1.5%	2,282,300			
2012-13	506,846	704,193	477,868	450,919	-	450,919	1,632,979	1.5%	1.5%	2,107,500			
2013-14	665,673	704,613	477,868	376,083	-	376,083	1,558,563	1.5%	1.5%	2,190,700			
2014-15	505,159	921,264	850,326	324,787	-	324,787	2,096,378	1.5%	1.5%	2,562,200			
<b>Annual Average: 2010 - 2014</b>	<b>707,291</b>	<b>747,826</b>	<b>552,359</b>	<b>416,838</b>	-	<b>416,838</b>	<b>1,717,023</b>	<b>1.5%</b>	<b>1.5%</b>	<b>2,387,720</b>			
2015-16	506,229	715,338	606,588	731,799	-	731,799	2,053,724	1.5%	1.5%	2,521,200			
2016-17	505,490	706,028	453,547	619,069	-	619,069	1,778,644	1.5%	1.5%	2,249,600			
2017-18	515,430	646,965	445,561	631,624	-	631,624	1,724,150	1.5%	1.5%	2,205,700			
2018-19	516,758	575,459	403,390	545,389	-	545,389	1,524,238	1.5%	1.5%	2,010,200			
2019-20	514,313	575,305	403,390	473,856	-	473,856	1,452,551	1.5%	1.5%	1,937,200			
<b>Annual Average: 2015 - 2019</b>	<b>511,644</b>	<b>643,819</b>	<b>462,495</b>	<b>600,347</b>	-	<b>600,347</b>	<b>1,706,661</b>	<b>1.5%</b>	<b>1.5%</b>	<b>2,184,780</b>			
2020-21	514,020	575,781	403,390	461,912	-	461,912	1,441,083	1.5%	1.5%	1,925,600			
2021-22	502,931	623,216	438,879	409,213	-	409,213	1,471,307	1.5%	1.5%	1,944,400			
2022-23	504,010	623,448	438,879	420,281	-	420,281	1,482,608	1.5%	1.5%	1,956,600			
2023-24	557,655	874,787	814,838	345,444	-	345,444	2,035,069	1.5%	1.5%	2,553,500			
2024-25	673,421	669,154	571,099	324,787	-	324,787	1,565,041	1.5%	1.5%	2,204,700			
<b>Annual Average: 2020 - 2024</b>	<b>550,407</b>	<b>673,277</b>	<b>533,417</b>	<b>392,327</b>	-	<b>392,327</b>	<b>1,599,022</b>	<b>1.5%</b>	<b>1.5%</b>	<b>2,116,960</b>			
2025-26	995,416	659,584	418,058	701,160	-	701,160	1,778,803	1.5%	1.5%	2,732,400			
2026-27	1,163,123	600,643	410,073	588,431	-	588,431	1,599,146	1.5%	1.5%	2,720,700			
2027-28	1,243,545	527,805	367,902	600,986	-	600,986	1,496,693	1.5%	1.5%	2,699,000			
2028-29	1,109,686	527,710	367,902	514,750	-	514,750	1,410,362	1.5%	1.5%	2,482,100			
2029-30	650,203	527,853	367,902	443,218	-	443,218	1,338,972	1.5%	1.5%	1,959,200			
<b>Annual Average: 2025 - 2029</b>	<b>1,032,395</b>	<b>568,719</b>	<b>386,367</b>	<b>569,709</b>	-	<b>569,709</b>	<b>1,524,795</b>	<b>1.5%</b>	<b>1.5%</b>	<b>2,518,680</b>			
2030-31	463,545	623,322	438,879	431,274	-	431,274	1,493,474	1.5%	1.5%	1,927,400			
2031-32	621,046	622,940	438,879	378,574	-	378,574	1,440,393	1.5%	1.5%	2,030,300			
2032-33	483,355	874,713	814,838	389,643	-	389,643	2,079,193	1.5%	1.5%	2,523,800			
2033-34	478,241	668,847	571,099	314,806	-	314,806	1,554,752	1.5%	1.5%	2,002,300			
2034-35	473,803	659,560	418,058	324,787	-	324,787	1,402,405	1.5%	1.5%	1,847,900			
<b>Annual Average: 2030 - 2034</b>	<b>503,998</b>	<b>689,876</b>	<b>536,350</b>	<b>367,817</b>	-	<b>367,817</b>	<b>1,594,044</b>	<b>1.5%</b>	<b>1.5%</b>	<b>2,066,340</b>			
<b>Annual Average: 2005 - 2034</b>	<b>715,291</b>	<b>685,784</b>	<b>512,800</b>	<b>493,653</b>	-	<b>493,653</b>	<b>1,692,237</b>	<b>1.5%</b>	<b>1.5%</b>	<b>2,371,200</b>			

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 30% of Class A logs from Pine sawtimber compartments (thinnings and clearfellings) were assumed to be pulpwood.  
 Pulpwood conversion ratios, m<sup>3</sup> to tons, are given in brackets.  
 Wattle regions were based on Extract Factory or Collection Depot location.  
 Wattle Jungle forecasts are based on: Mpumalanga South: 23,100 ha @ 3 tons/ha/annum, Northern KZNatal: 6,000 ha @ 3 tons/ha/annum and Eastern Cape: 18,000 ha @ 3 tons/ha/annum for one rotation and 10,000 ha @ 5 tons/ha/annum thereafter.  
 Mpumalanga South/Central Districts (Combined) includes both Regions' data, Zululand (Combined) includes Maputaland, Zululand and Northern KwaZulu-Natal Regions.  
 Some smoothing was applied to Pine and Eucalypt clearfelling areas in order to even out yields realistically.

Year	Tons										% Reduction for Fires and Other Factors:		Tons Total Forecast (Rounded to 100)
	Pine (1.00)	E. grandis (1.37)	Other Eucalypts (1.16)	Wattle (1.138)	Wattle Jungle (1.138)	Total Wattle	Total Hardwoods	% Reduction for Fires and Other Factors: Softwood	% Reduction for Fires and Other Factors: Hardwoods				
2005-06	350,675	608,326	446,849	34,533	-	34,533	1,089,707	2.7%	0.9%	1,421,500			
2006-07	470,127	628,713	435,816	36,985	-	36,985	1,101,513	2.7%	0.9%	1,549,400			
2007-08	501,246	577,434	233,914	41,730	-	41,730	853,078	2.7%	0.9%	1,333,400			
2008-09	450,842	506,824	386,041	51,299	-	51,299	944,164	2.7%	0.9%	1,374,700			
2009-10	824,235	525,098	261,308	26,466	-	26,466	812,872	2.7%	0.9%	1,607,800			
<b>Annual Average: 2005 - 2009</b>	<b>519,425</b>	<b>569,279</b>	<b>352,786</b>	<b>38,203</b>	-	<b>38,203</b>	<b>960,267</b>	<b>2.7%</b>	<b>0.9%</b>	<b>1,457,400</b>			
2010-11	600,746	524,948	261,308	31,714	-	31,714	817,969	2.7%	0.9%	1,395,400			
2011-12	386,323	524,819	261,308	18,585	-	18,585	804,712	2.7%	0.9%	1,173,600			
2012-13	269,425	524,956	261,308	23,172	-	23,172	809,435	2.7%	0.9%	1,064,600			
2013-14	437,769	525,009	261,308	21,828	-	21,828	808,144	2.7%	0.9%	1,227,100			
2014-15	339,118	536,754	620,244	31,239	-	31,239	1,188,238	2.7%	0.9%	1,507,900			
<b>Annual Average: 2010 - 2014</b>	<b>406,676</b>	<b>527,297</b>	<b>333,095</b>	<b>25,308</b>	-	<b>25,308</b>	<b>885,700</b>	<b>2.7%</b>	<b>0.9%</b>	<b>1,273,700</b>			
2015-16	333,658	514,104	399,694	31,929	-	31,929	945,726	2.7%	0.9%	1,262,200			
2016-17	331,530	463,574	197,792	34,155	-	34,155	695,521	2.7%	0.9%	1,012,100			
2017-18	332,034	392,774	349,919	38,900	-	38,900	781,593	2.7%	0.9%	1,097,900			
2018-19	333,142	411,080	225,185	48,470	-	48,470	684,735	2.7%	0.9%	1,003,000			
2019-20	345,744	411,358	225,185	23,637	-	23,637	660,180	2.7%	0.9%	990,900			
<b>Annual Average: 2015 - 2019</b>	<b>335,222</b>	<b>438,578</b>	<b>279,555</b>	<b>35,418</b>	-	<b>35,418</b>	<b>753,551</b>	<b>2.7%</b>	<b>0.9%</b>	<b>1,073,200</b>			
2020-21	331,268	411,132	225,185	29,884	-	29,884	666,201	2.7%	0.9%	982,800			
2021-22	322,360	443,424	247,045	16,756	-	16,756	707,225	2.7%	0.9%	1,014,800			
2022-23	324,294	443,532	247,045	21,343	-	21,343	711,920	2.7%	0.9%	1,021,300			
2023-24	309,541	504,970	598,385	19,999	-	19,999	1,123,353	2.7%	0.9%	1,414,800			
2024-25	436,509	482,626	377,834	31,239	-	31,239	891,699	2.7%	0.9%	1,308,700			
<b>Annual Average: 2020 - 2024</b>	<b>344,794</b>	<b>457,137</b>	<b>339,099</b>	<b>23,844</b>	-	<b>23,844</b>	<b>820,080</b>	<b>2.7%</b>	<b>0.9%</b>	<b>1,148,500</b>			
2025-26	468,023	431,797	175,933	30,100	-	30,100	637,830	2.7%	0.9%	1,087,700			
2026-27	403,586	361,044	328,059	32,326	-	32,326	721,429	2.7%	0.9%	1,107,900			
2027-28	792,978	379,151	203,326	37,071	-	37,071	619,548	2.7%	0.9%	1,385,800			
2028-29	559,029	378,982	203,326	46,641	-	46,641	628,949	2.7%	0.9%	1,167,400			
2029-30	367,116	378,955	203,326	21,808	-	21,808	604,088	2.7%	0.9%	956,100			
<b>Annual Average: 2025 - 2029</b>	<b>518,147</b>	<b>385,986</b>	<b>222,794</b>	<b>33,589</b>	-	<b>33,589</b>	<b>642,369</b>	<b>2.7%</b>	<b>0.9%</b>	<b>1,141,000</b>			
2030-31	241,844	443,188	247,045	28,055	-	28,055	718,288	2.7%	0.9%	947,400			
2031-32	420,765	443,322	247,045	14,927	-	14,927	705,294	2.7%	0.9%	1,108,600			
2032-33	341,058	504,578	598,385	19,514	-	19,514	1,122,477	2.7%	0.9%	1,444,600			
2033-34	332,418	482,300	377,834	18,170	-	18,170	878,304	2.7%	0.9%	1,194,100			
2034-35	317,846	431,344	175,933	31,239	-	31,239	638,516	2.7%	0.9%	942,300			
<b>Annual Average: 2030 - 2034</b>	<b>330,786</b>	<b>460,946</b>	<b>329,248</b>	<b>22,381</b>	-	<b>22,381</b>	<b>812,576</b>	<b>2.7%</b>	<b>0.9%</b>	<b>1,127,400</b>			
<b>Annual Average: 2005 - 2034</b>	<b>409,175</b>	<b>473,204</b>	<b>309,429</b>	<b>29,790</b>	-	<b>29,790</b>	<b>812,424</b>	<b>2.7%</b>	<b>0.9%</b>	<b>1,203,500</b>			

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Pulpwood conversion ratios, m<sup>3</sup> to tons, are given in brackets.

Wattle regions were based on Extract Factory or Collection Depot location.  
Wattle Jungle forecasts are based on: Mpumalanga South: 23,100 ha @ 3 tons/ha/annum, Northern KZNatal: 6,000 ha @ 3 tons/ha/annum and Eastern Cape: 18,000 ha @ 3 tons/ha/annum for one rotation and 10,000 ha @ 5 tons/ha/annum thereafter.

Mpumalanga South/Central Districts (Combined) includes both Regions' data, Zululand (Combined) includes Maputaland, Zululand and Northern KwaZulu-Natal Regions.  
Some smoothing was applied to Pine and Eucalypt clearfelling areas in order to even out yields realistically.

YEAR	Forecast of Roundwood other than Sawlogs in Tons: Eastern Cape: 2005 - 2034										TONS		
	TONS										% Reduction for Fires and Other Factors: Softwood	% Reduction for Fires and Other Factors: Hardwoods	Total Forecast (Rounded to 100)
	Pine (1.00)	E. grandis (1.37)	Other Eucalypts (1.16)	Wattle (1.138)	Wattle Jungle (1.138)	Wattle Total	Total Hardwoods						
2005-06	277,940	112,466	82,944	-	54,000	54,000	249,410	2.3%	0.8%	518,900			
2006-07	272,222	124,761	73,620	-	54,000	54,000	252,382	2.3%	0.8%	516,300			
2007-08	355,195	102,469	92,192	-	54,000	54,000	248,661	2.3%	0.8%	593,600			
2008-09	397,644	106,567	120,296	-	54,000	54,000	280,862	2.3%	0.8%	667,000			
2009-10	463,683	89,620	80,397	-	54,000	54,000	224,017	2.3%	0.8%	675,200			
<b>Annual Average: 2005 - 2009</b>	<b>353,337</b>	<b>107,177</b>	<b>89,890</b>	-	<b>54,000</b>	<b>54,000</b>	<b>251,066</b>	<b>2.3%</b>	<b>0.8%</b>	<b>594,200</b>			
2010-11	549,366	89,502	80,397	-	54,000	54,000	223,899	2.3%	0.8%	758,800			
2011-12	267,052	89,422	80,397	-	54,000	54,000	223,819	2.3%	0.8%	482,900			
2012-13	299,812	89,395	80,397	-	54,000	54,000	223,792	2.3%	0.8%	514,900			
2013-14	300,809	89,388	80,397	-	54,000	54,000	223,786	2.3%	0.8%	515,800			
2014-15	291,695	170,002	60,335	-	54,000	54,000	284,338	2.3%	0.8%	567,000			
<b>Annual Average: 2010 - 2014</b>	<b>341,747</b>	<b>105,542</b>	<b>76,385</b>	-	<b>54,000</b>	<b>54,000</b>	<b>235,927</b>	<b>2.3%</b>	<b>0.8%</b>	<b>567,900</b>			
2015-16	387,474	111,505	53,201	-	50,000	50,000	214,706	2.3%	0.8%	591,500			
2016-17	216,755	89,089	71,773	-	50,000	50,000	210,862	2.3%	0.8%	420,900			
2017-18	237,705	93,325	99,877	-	50,000	50,000	243,201	2.3%	0.8%	473,400			
2018-19	255,865	76,650	59,978	-	50,000	50,000	186,628	2.3%	0.8%	435,100			
2019-20	278,704	76,522	59,978	-	50,000	50,000	186,501	2.3%	0.8%	457,300			
<b>Annual Average: 2015 - 2019</b>	<b>275,301</b>	<b>89,418</b>	<b>68,961</b>	-	<b>50,000</b>	<b>50,000</b>	<b>208,380</b>	<b>2.3%</b>	<b>0.8%</b>	<b>475,600</b>			
2020-21	314,289	77,111	59,978	-	50,000	50,000	187,089	2.3%	0.8%	492,600			
2021-22	211,061	83,736	64,726	-	50,000	50,000	198,463	2.3%	0.8%	403,000			
2022-23	239,630	83,838	64,726	-	50,000	50,000	198,564	2.3%	0.8%	431,000			
2023-24	153,098	163,497	55,587	-	50,000	50,000	269,084	2.3%	0.8%	416,400			
2024-25	181,055	105,386	48,453	-	50,000	50,000	203,840	2.3%	0.8%	379,000			
<b>Annual Average: 2020 - 2024</b>	<b>219,827</b>	<b>102,714</b>	<b>58,694</b>	-	<b>50,000</b>	<b>50,000</b>	<b>211,408</b>	<b>2.3%</b>	<b>0.8%</b>	<b>424,400</b>			
2025-26	350,300	82,850	67,025	-	50,000	50,000	199,875	2.3%	0.8%	540,500			
2026-27	418,886	87,065	95,128	-	50,000	50,000	232,193	2.3%	0.8%	639,500			
2027-28	385,201	69,951	55,230	-	50,000	50,000	175,181	2.3%	0.8%	550,100			
2028-29	266,474	69,569	55,230	-	50,000	50,000	174,799	2.3%	0.8%	433,700			
2029-30	261,854	69,519	55,230	-	50,000	50,000	174,749	2.3%	0.8%	429,100			
<b>Annual Average: 2025 - 2029</b>	<b>336,543</b>	<b>75,791</b>	<b>65,569</b>	-	<b>50,000</b>	<b>50,000</b>	<b>191,360</b>	<b>2.3%</b>	<b>0.8%</b>	<b>518,600</b>			
2030-31	462,248	83,343	64,726	-	50,000	50,000	198,070	2.3%	0.8%	648,000			
2031-32	325,968	83,234	64,726	-	50,000	50,000	197,960	2.3%	0.8%	514,800			
2032-33	321,522	163,283	55,587	-	50,000	50,000	268,870	2.3%	0.8%	580,800			
2033-34	280,034	104,983	48,453	-	50,000	50,000	203,436	2.3%	0.8%	475,300			
2034-35	288,435	82,607	67,025	-	50,000	50,000	199,632	2.3%	0.8%	479,800			
<b>Annual Average: 2030 - 2034</b>	<b>335,641</b>	<b>103,490</b>	<b>60,103</b>	-	<b>50,000</b>	<b>50,000</b>	<b>213,593</b>	<b>2.3%</b>	<b>0.8%</b>	<b>539,700</b>			
<b>Annual Average: 2005 - 2034</b>	<b>310,399</b>	<b>97,355</b>	<b>69,934</b>	-	<b>51,333</b>	<b>51,333</b>	<b>218,622</b>	<b>2.3%</b>	<b>0.8%</b>	<b>520,100</b>			

Logs included are those of pulpwood dimensions only from each timber type and therefore includes by-products from the sawlog production operations.  
 30% of Class A logs from Pine sawtimber compartments (thinnings and clearfellings) were assumed to be pulpwood.  
 Pulpwood conversion ratios, m<sup>3</sup> to tons, are given in brackets.  
 Wattle regions were based on Extract Factory or Collection Depot location.  
 Wattle Jungle forecasts are based on: Mpumalanga South: 23,100 ha @ 3 tons/ha/annum, Northern KZNatal: 6,000 ha @ 3 tons/ha/annum and Eastern Cape: 18,000 ha @ 3 tons/ha/annum for one rotation and 10,000 ha @ 5 tons/ha/annum thereafter.  
 Mpumalanga South/Central Districts (Combined) includes both Regions' data, Zululand (Combined) includes Maputaland, Zululand and Northern KwaZulu-Natal Regions.  
 Some smoothing was applied to Pine and Eucalypt clearfelling areas in order to even out yields realistically.

YEAR	Forecast of Roundwood other than Sawlogs in Tons: Southern Cape: 2005 - 2034											TONS Total Forecast (Rounded to 100)
	TONS											
	Pine (1.00)	E. grandis (1.37)	Other Eucalypts (1.16)	Wattle (1.138)	Wattle Jungle (1.138)	Total Wattle	Total Hardwoods	% Reduction for Fires and Other Factors: Softwood	% Reduction for Fires and Other Factors: Hardwoods			
2005-06	82,025	132	46,463	-	-	-	46,595	1.9%	1.2%			126,500
2006-07	88,342	132	7,230	-	-	-	7,362	1.9%	1.2%			93,900
2007-08	112,334	132	9,545	-	-	-	9,677	1.9%	1.2%			119,800
2008-09	105,824	132	9,248	-	-	-	9,380	1.9%	1.2%			113,100
2009-10	112,178	216	11,311	-	-	-	11,527	1.9%	1.2%			121,500
<b>Annual Average: 2005 - 2009</b>	<b>100,140</b>	<b>149</b>	<b>16,759</b>	-	-	-	<b>16,908</b>	<b>1.9%</b>	<b>1.2%</b>			<b>115,000</b>
2010-11	199,093	216	6,912	-	-	-	7,128	1.9%	1.2%			202,400
2011-12	74,924	216	9,174	-	-	-	9,390	1.9%	1.2%			82,800
2012-13	96,196	216	7,583	-	-	-	7,799	1.9%	1.2%			102,100
2013-14	72,028	216	19,762	-	-	-	19,978	1.9%	1.2%			90,400
2014-15	87,926	46	4,775	-	-	-	4,821	1.9%	1.2%			91,000
<b>Annual Average: 2010 - 2014</b>	<b>106,033</b>	<b>182</b>	<b>9,641</b>	-	-	-	<b>9,823</b>	<b>1.9%</b>	<b>1.2%</b>			<b>113,700</b>
2015-16	131,622	132	7,296	-	-	-	7,428	1.9%	1.2%			136,500
2016-17	55,456	132	6,568	-	-	-	6,700	1.9%	1.2%			61,000
2017-18	60,698	132	25,792	-	-	-	25,923	1.9%	1.2%			85,200
2018-19	43,923	216	5,049	-	-	-	5,265	1.9%	1.2%			48,300
2019-20	57,646	216	6,988	-	-	-	7,204	1.9%	1.2%			63,700
<b>Annual Average: 2015 - 2019</b>	<b>69,869</b>	<b>166</b>	<b>10,339</b>	-	-	-	<b>10,504</b>	<b>1.9%</b>	<b>1.2%</b>			<b>78,900</b>
2020-21	99,171	132	5,875	-	-	-	6,007	1.9%	1.2%			103,200
2021-22	53,890	216	5,295	-	-	-	5,511	1.9%	1.2%			58,300
2022-23	60,100	216	4,683	-	-	-	4,899	1.9%	1.2%			63,800
2023-24	33,222	50	2,279	-	-	-	2,330	1.9%	1.2%			34,900
2024-25	39,305	132	4,600	-	-	-	4,732	1.9%	1.2%			43,200
<b>Annual Average: 2020 - 2024</b>	<b>57,137</b>	<b>149</b>	<b>4,546</b>	-	-	-	<b>4,696</b>	<b>1.9%</b>	<b>1.2%</b>			<b>60,700</b>
2025-26	39,232	132	4,862	-	-	-	4,993	1.9%	1.2%			43,400
2026-27	41,837	132	4,749	-	-	-	4,881	1.9%	1.2%			45,900
2027-28	56,427	216	5,379	-	-	-	5,595	1.9%	1.2%			60,900
2028-29	29,261	216	4,879	-	-	-	5,096	1.9%	1.2%			33,700
2029-30	27,848	132	6,403	-	-	-	6,535	1.9%	1.2%			33,800
<b>Annual Average: 2025 - 2029</b>	<b>38,921</b>	<b>166</b>	<b>5,254</b>	-	-	-	<b>5,420</b>	<b>1.9%</b>	<b>1.2%</b>			<b>43,500</b>
2030-31	92,585	216	40,492	-	-	-	40,708	1.9%	1.2%			131,100
2031-32	29,227	216	5,036	-	-	-	5,252	1.9%	1.2%			33,900
2032-33	30,718	50	3,171	-	-	-	3,221	1.9%	1.2%			33,300
2033-34	17,335	132	7,026	-	-	-	7,158	1.9%	1.2%			24,100
2034-35	4,124	132	9,115	-	-	-	9,246	1.9%	1.2%			13,200
<b>Annual Average: 2030 - 2034</b>	<b>34,798</b>	<b>149</b>	<b>12,968</b>	-	-	-	<b>13,117</b>	<b>1.9%</b>	<b>1.2%</b>			<b>47,100</b>
<b>Annual Average: 2005 - 2034</b>	<b>67,817</b>	<b>160</b>	<b>9,918</b>	-	-	-	<b>10,078</b>	<b>1.9%</b>	<b>1.2%</b>			<b>76,500</b>

Logs included are those of pulpwood dimensions only from each timber type and therefore includes by-products from the sawlog production operations.  
30% of Class A logs from Pine sawtimber compartments (thinnings and clearfellings) were assumed to be pulpwood.

Pulpwood conversion ratios, m<sup>3</sup> to tons, are given in brackets.

Wattle regions were based on Extract Factory or Collection Depot location.

Wattle Jungle forecasts are based on: Mpumalanga South: 23,100 ha @ 3 tons/ha/annum, Northern KZNatal: 6,000 ha @ 3 tons/ha/annum and Eastern Cape: 18,000 ha @ 3 tons/ha/annum for one rotation and 10,000 ha @ 5 tons/ha/annum thereafter.

Mpumalanga South/Central Districts (Combined) includes both Regions' data, Zululand (Combined) includes Maputaland, Zululand and Northern KwaZulu-Natal Regions.

Some smoothing was applied to Pine and Eucalypt clearfelling areas in order to even out yields realistically.

FORECAST OF ROUNDWOOD OTHER THAN SAWLOGS IN TONS: WESTERN CAPE: 2005 - 2034															
YEAR	TONS							% Reduction for Fires and Other Factors:		Total Hardwoods	Total Wattle	Wattle Jungle (1.138)	Total Hardwoods	% Reduction for Fires and Other Factors: Hardwoods	TONS Total Forecast (Rounded to 100)
	Pine (1.00)	E. grandis (1.37)	Other Eucalypts (1.16)	Wattle (1.138)	Wattle Jungle (1.138)	Total Wattle	Total Hardwoods	Softwood							
2005-06	39,213	129	4,348	-	-	-	4,477	4.0%	5.3%	-	-	4,477	5.3%	41,900	
2006-07	24,124	129	3,338	-	-	-	3,467	4.0%	5.3%	-	-	3,467	5.3%	26,400	
2007-08	18,165	129	3,404	-	-	-	3,533	4.0%	5.3%	-	-	3,533	5.3%	20,800	
2008-09	22,759	129	3,345	-	-	-	3,474	4.0%	5.3%	-	-	3,474	5.3%	25,100	
2009-10	27,573	146	3,519	-	-	-	3,665	4.0%	5.3%	-	-	3,665	5.3%	29,900	
<b>Annual Average: 2005 - 2009</b>	<b>26,367</b>	<b>132</b>	<b>3,591</b>	-	-	-	<b>3,723</b>	<b>4.0%</b>	<b>5.3%</b>	-	-	<b>3,723</b>	<b>5.3%</b>	<b>28,800</b>	
2010-11	57,148	146	3,404	-	-	-	3,550	4.0%	5.3%	-	-	3,550	5.3%	58,200	
2011-12	18,927	146	3,410	-	-	-	3,556	4.0%	5.3%	-	-	3,556	5.3%	21,500	
2012-13	15,625	146	3,405	-	-	-	3,551	4.0%	5.3%	-	-	3,551	5.3%	18,400	
2013-14	14,153	146	3,747	-	-	-	3,893	4.0%	5.3%	-	-	3,893	5.3%	17,300	
2014-15	15,879	80	1,636	-	-	-	1,716	4.0%	5.3%	-	-	1,716	5.3%	16,900	
<b>Annual Average: 2010 - 2014</b>	<b>24,346</b>	<b>133</b>	<b>3,120</b>	-	-	-	<b>3,253</b>	<b>4.0%</b>	<b>5.3%</b>	-	-	<b>3,253</b>	<b>5.3%</b>	<b>26,500</b>	
2015-16	32,535	84	2,222	-	-	-	2,207	4.0%	5.3%	-	-	2,207	5.3%	33,400	
2016-17	10,556	84	2,220	-	-	-	2,304	4.0%	5.3%	-	-	2,304	5.3%	12,300	
2017-18	6,149	84	2,763	-	-	-	2,848	4.0%	5.3%	-	-	2,848	5.3%	8,600	
2018-19	5,513	17	2,302	-	-	-	2,318	4.0%	5.3%	-	-	2,318	5.3%	7,500	
2019-20	10,587	101	2,305	-	-	-	2,407	4.0%	5.3%	-	-	2,407	5.3%	12,400	
<b>Annual Average: 2015 - 2019</b>	<b>13,068</b>	<b>74</b>	<b>2,363</b>	-	-	-	<b>2,437</b>	<b>4.0%</b>	<b>5.3%</b>	-	-	<b>2,437</b>	<b>5.3%</b>	<b>14,800</b>	
2020-21	18,311	101	2,389	-	-	-	2,491	4.0%	5.3%	-	-	2,491	5.3%	19,900	
2021-22	7,469	101	2,296	-	-	-	2,397	4.0%	5.3%	-	-	2,397	5.3%	9,400	
2022-23	6,643	101	2,288	-	-	-	2,390	4.0%	5.3%	-	-	2,390	5.3%	8,600	
2023-24	7,599	38	537	-	-	-	574	4.0%	5.3%	-	-	574	5.3%	7,800	
2024-25	9,246	84	2,219	-	-	-	2,304	4.0%	5.3%	-	-	2,304	5.3%	11,100	
<b>Annual Average: 2020 - 2024</b>	<b>9,854</b>	<b>85</b>	<b>1,946</b>	-	-	-	<b>2,031</b>	<b>4.0%</b>	<b>5.3%</b>	-	-	<b>2,031</b>	<b>5.3%</b>	<b>11,400</b>	
2025-26	10,463	84	2,215	-	-	-	2,300	4.0%	5.3%	-	-	2,300	5.3%	12,200	
2026-27	4,544	84	2,220	-	-	-	2,304	4.0%	5.3%	-	-	2,304	5.3%	6,500	
2027-28	2,047	17	2,289	-	-	-	2,306	4.0%	5.3%	-	-	2,306	5.3%	4,100	
2028-29	1,832	101	2,300	-	-	-	2,401	4.0%	5.3%	-	-	2,401	5.3%	4,000	
2029-30	2,530	101	2,287	-	-	-	2,388	4.0%	5.3%	-	-	2,388	5.3%	4,700	
<b>Annual Average: 2025 - 2029</b>	<b>4,283</b>	<b>78</b>	<b>2,262</b>	-	-	-	<b>2,340</b>	<b>4.0%</b>	<b>5.3%</b>	-	-	<b>2,340</b>	<b>5.3%</b>	<b>6,300</b>	
2030-31	16,248	101	3,239	-	-	-	3,340	4.0%	5.3%	-	-	3,340	5.3%	18,800	
2031-32	3,545	101	2,293	-	-	-	2,395	4.0%	5.3%	-	-	2,395	5.3%	5,700	
2032-33	3,143	38	571	-	-	-	608	4.0%	5.3%	-	-	608	5.3%	3,600	
2033-34	2,878	84	2,228	-	-	-	2,313	4.0%	5.3%	-	-	2,313	5.3%	5,000	
2034-35	745	84	2,331	-	-	-	2,415	4.0%	5.3%	-	-	2,415	5.3%	3,000	
<b>Annual Average: 2030 - 2034</b>	<b>5,312</b>	<b>82</b>	<b>2,132</b>	-	-	-	<b>2,214</b>	<b>4.0%</b>	<b>5.3%</b>	-	-	<b>2,214</b>	<b>5.3%</b>	<b>7,200</b>	
<b>Annual Average: 2005 - 2034</b>	<b>13,872</b>	<b>97</b>	<b>2,569</b>	-	-	-	<b>2,666</b>	<b>4.0%</b>	<b>5.3%</b>	-	-	<b>2,666</b>	<b>5.3%</b>	<b>15,800</b>	

Logs included are those of pulpwood dimensions only from each timber type and therefore includes by-products from the sawlog production operations.  
30% of Class a logs from Pine sawtimber compartments (thinnings and clearfellings) were assumed to be pulpwood.

Pulpwood conversion ratios, m<sup>3</sup> to tons, are given in brackets.

Wattle regions were based on Extract Factory or Collection Depot location.

Wattle Jungle forecasts are based on: Mpumalanga South: 23,100 ha @ 3 tons/ha/annum, Northern KZNatal: 6,000 ha @ 3 tons/ha/annum and Eastern Cape: 18,000 ha @ 3 tons/ha/annum for one rotation and 10,000 ha @ 5 tons/ha/annum thereafter.

Mpumalanga South/Central Districts (Combined) includes both Regions' data, Zululand (Combined) includes Maputaland, Zululand and Northern KwaZulu-Natal Regions.

Some smoothing was applied to Pine and Eucalypt clearfelling areas in order to even out yields realistically.

2004 ROUNDWOOD DEMAND OTHER THAN FOR SAWLOGS ('000 tons - rounded to the closest 1,000 tons)								
		SOFTWOOD	SUB TOTAL	Wattle	HARDWOOD		SUB TOTAL	TOTAL
		Logs			Hard Gum	E.grandis		
<b>PULP AND PAPER</b>								
Sappi	Enstra	-	-	-	280	-	280	280
	Ngodwana	1,700	1,700	-	50	200	250	1,950
	Mandini	800	800	-	220	-	220	1,020
	Saiccor	-	-	190	200	1,750	2,140	2,140
Mondi	Richards Bay	431	431	-	1,221	650	1,871	2,302
	Merebank	617	617	-	-	-	-	617
	Piet Retief	-	-	-	-	70	70	70
<b>Sub Total</b>		<b>3,548</b>	<b>3,548</b>	<b>190</b>	<b>1,971</b>	<b>2,670</b>	<b>4,831</b>	<b>8,379</b>
<b>BOARD MILLS</b>								
Masonite		-	-	-	-	200	200	200
Sonae	White River	13	13	-	-	80	80	93
	Panbult	43	43	-	65	-	65	108
	George	8	8	-	332	-	332	340
PG Bison	Piet Retief	-	-	-	40	40	80	80
	Pietermaritzburg	37	37	-	10	54	64	101
	Stellenbosch	18	18	-	10	-	10	28
	Boksburg	-	-	-	-	60	60	60
Chipboard Industries	near Langeni	66	66	-	-	-	-	66
<b>Sub Total</b>		<b>185</b>	<b>185</b>	<b>-</b>	<b>457</b>	<b>434</b>	<b>891</b>	<b>1,076</b>
<b>CHIPPING PLANTS</b>								
CTC	Richards Bay	-	-	700	527	1,173	2,400	2,400
Silvaceel		-	-	324	871	720	1,915	1,915
Shincell		-	-	100	60	460	620	620
NCT	Durban	-	-	-	-	120	120	120
<b>Sub Total</b>		<b>-</b>	<b>-</b>	<b>1,124</b>	<b>1,458</b>	<b>2,473</b>	<b>5,055</b>	<b>5,055</b>
<b>MINING TIMBER</b>		<b>-</b>	<b>-</b>	<b>-</b>	<b>200</b>	<b>629</b>	<b>829</b>	<b>829</b>
<b>EXPORTS</b>		<b>260</b>	<b>260</b>	<b>-</b>	<b>-</b>	<b>300</b>	<b>300</b>	<b>560</b>
<b>Sub Total</b>		<b>260</b>	<b>260</b>	<b>-</b>	<b>200</b>	<b>929</b>	<b>1,129</b>	<b>1,389</b>
<b>OTHER</b>								
POLES	70% Recovery	316	316	-	-	446	446	762
CHARCOAL TIMBER		-	-	369	60	-	429	429
<b>TOTAL CONSUMED IN RSA</b>		<b>4,309</b>	<b>4,309</b>	<b>1,683</b>	<b>4,146</b>	<b>6,952</b>	<b>12,781</b>	<b>17,090</b>
Less								
Swaziland		25	25	10	-	100	110	135
Zimbabwe		-	-	56	-	-	56	56
Namibia		-	-	-	80	-	80	80
<b>TOTAL DEMAND FOR RSA</b>		<b>4,284</b>	<b>4,284</b>	<b>1,617</b>	<b>4,066</b>	<b>6,852</b>	<b>12,535</b>	<b>16,819</b>
Waste excluded								688

NOTES: The market as it is estimated to be at present.

<b>DEMAND FOR WASTE ('000 tons - rounded to the closest 1,000 tons) 2004 ONWARDS</b>				
		<b>SOFTWOOD</b>	<b>HARDWOOD</b>	<b>TOTAL</b>
		<b>Chips + Waste</b>	<b>Waste</b>	
<b>PULP AND PAPER</b>				
Sappi	Enstra	-	-	-
	Ngodwana	122	-	122
	Mandini	102	-	102
	Saiccor	-	-	-
Mondi	Richards Bay	-	-	-
	Merebank	-	-	-
	Piet Retief	-	-	-
<b>Sub Total</b>		<b>224</b>	<b>-</b>	<b>224</b>
<b>BOARD MILLS</b>				
Masonite		-	-	-
Sonae	White River	17	37	54
	Panbult	43	-	43
	George	29	5	34
PG Bison	Piet Retief	51	30	81
	Pietermaritzburg	6	27	33
	Stellenbosch	25	-	25
	Boksburg	5	60	65
Chipboard Industry		-	44	44
	Langeni	47	-	47
<b>Sub Total</b>		<b>223</b>	<b>203</b>	<b>426</b>
<b>SILICON SMELTERS</b>		-	-	<b>27</b>
<b>HEATLOG</b>		-	-	<b>10</b>
<b>GRAND TOTAL</b>		<b>447</b>	<b>203</b>	<b>688</b>

**NOTE:** While the overall volume of Gum is accurate the split between Hard Gum and Grandis is interpolated and is not accurate.

2005 ROUNDWOOD DEMAND OTHER THAN FOR SAWLOGS ('000 tons - rounded to the closest 1,000 tons)								
		SOFTWOOD	SUB TOTAL	Wattle	HARDWOOD		SUB TOTAL	TOTAL
		Logs			Hard Gum	E.grandis		
<b>PULP AND PAPER</b>								
Sappi	Enstra	-	-	-	280	-	280	280
	Ngodwana	1,000	1,000	-	250	700	950	1,950
	Mandini	800	800	-	220	-	220	1,020
	Saiccor	-	-	190	200	1,950	2,340	2,340
Mondi	Richards Bay	431	431	-	1,421	1,050	2,471	2,902
	Merebank	485	485	-	-	-	-	485
	Piet Retief	-	-	-	-	70	70	70
<b>Sub Total</b>		<b>2,716</b>	<b>2,716</b>	<b>190</b>	<b>2,371</b>	<b>3,770</b>	<b>6,331</b>	<b>9,047</b>
<b>BOARD MILLS</b>								
Masonite		-	-	-	-	200	200	200
Sonae	White River	13	13	-	-	80	80	93
	Panbult	43	43	-	65	-	65	108
	George	8	8	-	-	-	-	8
PG Bison	Piet Retief	100	100	-	-	-	-	100
	Pietermaritzburg	37	37	-	10	54	64	101
	Stellenbosch	18	18	-	10	-	10	28
	Boksburg	-	-	-	-	60	60	60
Chipboard Industries	near Langeni	66	66	-	-	-	-	66
<b>Sub Total</b>		<b>285</b>	<b>285</b>	<b>-</b>	<b>85</b>	<b>394</b>	<b>479</b>	<b>764</b>
<b>CHIPPING PLANTS</b>								
CTC	Richards Bay	-	-	700	527	1,173	2,400	2,400
Silvaceel		-	-	324	871	720	1,915	1,915
Shincell		-	-	100	60	460	620	620
NCT	Durban	-	-	-	-	350	350	350
<b>Sub Total</b>		<b>-</b>	<b>-</b>	<b>1,124</b>	<b>1,458</b>	<b>2,703</b>	<b>5,285</b>	<b>5,285</b>
<b>MINING TIMBER</b>								
		-	-	-	200	579	779	779
<b>EXPORTS</b>								
		-	-	-	-	-	-	-
<b>Sub Total</b>		<b>-</b>	<b>-</b>	<b>-</b>	<b>200</b>	<b>579</b>	<b>779</b>	<b>779</b>
<b>OTHER</b>								
POLES	70% Recovery	316	316	-	-	446	446	762
CHARCOAL TIMBER		-	-	400	472	-	872	872
<b>TOTAL CONSUMED IN RSA</b>		<b>3,317</b>	<b>3,317</b>	<b>1,714</b>	<b>4,586</b>	<b>7,892</b>	<b>14,192</b>	<b>17,509</b>
Less								
Swaziland		25	25	10	-	100	110	135
Zimbabwe		-	-	56	-	-	56	56
Namibia		-	-	-	80	-	80	80
<b>TOTAL DEMAND FOR RSA</b>		<b>3,292</b>	<b>3,292</b>	<b>1,648</b>	<b>4,506</b>	<b>7,792</b>	<b>13,946</b>	<b>17,238</b>
Waste excluded								688

**NOTES:**

1. Export of Eucalypt and Pine roundwood terminated.
2. Merebank intake reduced from 617,000 to 485,000 tons Pine.
3. Mondi Richards Bay intake increased by 600,000 tons Eucalypt.
4. SAICCOR increased by 200,000 tons Eucalypt.
5. PG Bison Piet Retief convert to Pine.
6. NCT Durban up to full production.
7. Mining Timber reduced by 50,000 tons per annum.

2006 ROUNDWOOD DEMAND OTHER THAN FOR SAWLOGS ('000 tons - rounded to the closest 1,000 tons)							
	SOFTWOOD		Wattle	HARDWOOD		SUB TOTAL	TOTAL
	Logs	SUB TOTAL		Hard Gum	E.grandis		
<b>PULP AND PAPER</b>							
Sappi	Enstra	-		280		280	280
	Ngodwana	1,000		250	700	950	1,950
	Mandini	800		220		220	1,020
	Saiccor	-	190	200	1,950	2,340	2,340
Mondi	Richards Bay	431		1,421	1,050	2,471	2,902
	Merebank	485				-	485
	Piet Retief	-			70	70	70
<b>Sub Total</b>		<b>2,716</b>	<b>190</b>	<b>2,371</b>	<b>3,770</b>	<b>6,331</b>	<b>9,047</b>
<b>BOARD MILLS</b>							
Masonite		-			200	200	200
Sonae	White River	13			80	80	93
	Panbult	43		65		65	108
	George	8				-	8
PG Bison	Piet Retief	100				-	100
	Pietermaritzburg	37		10	54	64	101
	Stellenbosch	18		10		10	28
	Boksburg	-			60	60	60
Chipboard Industries	near Langeni	66				-	66
<b>Sub Total</b>		<b>285</b>	<b>-</b>	<b>85</b>	<b>394</b>	<b>479</b>	<b>764</b>
<b>CHIPPING PLANTS</b>							
CTC	Richards Bay	-	700	527	1,173	2,400	2,400
Silvaceel		-	324	871	720	1,915	1,915
Shincell		-	100	60	460	620	620
NCT	Durban				350	350	350
<b>Sub Total</b>		<b>-</b>	<b>1,124</b>	<b>1,458</b>	<b>2,703</b>	<b>5,285</b>	<b>5,285</b>
<b>MINING TIMBER</b>							
		-	-	-	200	529	729
<b>EXPORTS</b>							
		-	-	-	-	-	-
<b>Sub Total</b>		<b>-</b>	<b>-</b>	<b>-</b>	<b>200</b>	<b>529</b>	<b>729</b>
<b>OTHER</b>							
POLES	70% Recovery	316		-	446	446	762
CHARCOAL TIMBER		-	400	472	-	872	872
<b>TOTAL CONSUMED IN RSA</b>		<b>3,317</b>	<b>1,714</b>	<b>4,586</b>	<b>7,842</b>	<b>14,142</b>	<b>17,459</b>
Less							
	Swaziland	25	10	-	100	110	135
	Zimbabwe	-	56	-	-	56	56
	Namibia	-	-	80	-	80	80
<b>TOTAL DEMAND FOR RSA</b>		<b>3,292</b>	<b>1,648</b>	<b>4,506</b>	<b>7,742</b>	<b>13,896</b>	<b>17,188</b>
Waste excluded							688

**NOTES:**

1. Mining Timber reduced by 50,000 tons per annum.

2007 ROUNDWOOD DEMAND OTHER THAN FOR SAWLOGS ('000 tons - rounded to the closest 1,000 tons)								
		SOFTWOOD	SUB TOTAL	Wattle	HARDWOOD		SUB TOTAL	TOTAL
		Logs			Hard Gum	E.grandis		
<b>PULP AND PAPER</b>								
Sappi	Enstra	-	-	-	280	-	280	280
	Ngodwana	1,000	1,000	-	250	700	950	1,950
	Mandini	800	800	-	220	-	220	1,020
	Saiccor	-	-	190	200	1,950	2,340	2,340
Mondi	Richards Bay	431	431	-	1,421	1,050	2,471	2,902
	Merebank	485	485	-	-	-	-	485
	Piet Retief	-	-	-	-	70	70	70
<b>Sub Total</b>		<b>2,716</b>	<b>2,716</b>	<b>190</b>	<b>2,371</b>	<b>3,770</b>	<b>6,331</b>	<b>9,047</b>
<b>BOARD MILLS</b>								
Masonite		-	-	-	-	200	200	200
Sonae	White River	13	13	-	-	80	80	93
	Panbult	43	43	-	65	-	65	108
	George	8	8	-	-	-	-	8
PG Bison	Piet Retief	20	20	-	40	40	80	100
	Pietermaritzburg	37	37	-	10	54	64	101
	Stellenbosch	18	18	-	10	-	10	28
	Boksburg	-	-	-	-	60	60	60
Chipboard Industries	near Langeni	66	66	-	-	-	-	66
	Umtata	50	50	-	-	-	-	50
<b>Sub Total</b>		<b>255</b>	<b>255</b>	<b>-</b>	<b>125</b>	<b>434</b>	<b>559</b>	<b>814</b>
<b>CHIPPING PLANTS</b>								
CTC	Richards Bay	-	-	700	527	1,173	2,400	2,400
Silvacel		-	-	324	871	720	1,915	1,915
Shincell		-	-	100	60	460	620	620
NCT	Durban	-	-	-	-	120	120	120
<b>Sub Total</b>		<b>-</b>	<b>-</b>	<b>1,124</b>	<b>1,458</b>	<b>2,473</b>	<b>5,055</b>	<b>5,055</b>
<b>MINING TIMBER</b>								
		-	-	-	200	479	679	679
<b>EXPORTS</b>								
		-	-	-	-	-	-	-
<b>Sub Total</b>		<b>-</b>	<b>-</b>	<b>-</b>	<b>200</b>	<b>479</b>	<b>679</b>	<b>679</b>
<b>OTHER</b>								
POLES	70% Recovery	316	316	-	-	446	446	762
CHARCOAL TIMBER		-	-	400	472	-	872	872
<b>TOTAL CONSUMED IN RSA</b>		<b>3,287</b>	<b>3,287</b>	<b>1,714</b>	<b>4,626</b>	<b>7,602</b>	<b>13,942</b>	<b>17,229</b>
Less								
Swaziland		25	25	10	-	100	110	135
Zimbabwe		-	-	56	-	-	56	56
Namibia		-	-	-	80	-	80	80
<b>TOTAL DEMAND FOR RSA</b>		<b>3,262</b>	<b>3,262</b>	<b>1,648</b>	<b>4,546</b>	<b>7,502</b>	<b>13,696</b>	<b>16,958</b>
Waste excluded								688

**NOTES:**

CHANGES FROM 2006

1. New Particle Board plant at Umtata 50,000 tons.
2. PG Bison Piet Retief convert to Pine.
3. Mining Timber reduced by 50,000 tons per annum.

2008 ROUNDWOOD DEMAND OTHER THAN FOR SAWLOGS ('000 tons - rounded to the closest 1,000 tons)								
		SOFTWOOD	SUB TOTAL	Wattle	HARDWOOD		SUB TOTAL	TOTAL
		Logs			Hard Gum	E.grandis		
<b>PULP AND PAPER</b>								
Sappi	Enstra	-	-	-	280	-	280	280
	Ngodwana	1,000	1,000	-	250	700	950	1,950
	Mandini	800	800	-	220	-	220	1,020
	Saiccor	-	-	190	200	1,950	2,340	2,340
Mondi	Richards Bay	431	431	-	1,421	1,050	2,471	2,902
	Merebank	485	485	-	-	-	-	485
	Piet Retief	-	-	-	-	70	70	70
NCT	Richards Bay	-	-	-	-	200	200	200
<b>Sub Total</b>		<b>2,716</b>	<b>2,716</b>	<b>190</b>	<b>2,371</b>	<b>3,970</b>	<b>6,531</b>	<b>9,247</b>
<b>BOARD MILLS</b>								
Masonite		-	-	-	-	200	200	200
Sonae	White River	13	13	-	-	80	80	93
	Panbult	43	43	-	65	-	65	108
	George	8	8	-	-	-	-	8
PG Bison	Piet Retief	-	-	-	40	40	80	80
	Pietermaritzburg	37	37	-	10	54	64	101
	Stellenbosch	18	18	-	10	-	10	28
	Boksburg	-	-	-	-	60	60	60
Chipboard Industries	near Langeni	66	66	-	-	-	-	66
	Umtata	50	50	-	-	-	-	50
<b>Sub Total</b>		<b>235</b>	<b>235</b>	<b>-</b>	<b>125</b>	<b>434</b>	<b>559</b>	<b>794</b>
<b>CHIPPING PLANTS</b>								
CTC	Richards Bay	-	-	700	527	1,173	2,400	2,400
Silvacel		-	-	324	871	720	1,915	1,915
Shincell		-	-	100	60	460	620	620
NCT	Durban	-	-	-	-	350	350	350
<b>Sub Total</b>		<b>-</b>	<b>-</b>	<b>1,124</b>	<b>1,458</b>	<b>2,703</b>	<b>5,285</b>	<b>5,285</b>
<b>MINING TIMBER</b>								
		-	-	-	200	429	629	629
<b>EXPORTS</b>								
		-	-	-	-	-	-	-
<b>Sub Total</b>		<b>-</b>	<b>-</b>	<b>-</b>	<b>200</b>	<b>429</b>	<b>629</b>	<b>629</b>
<b>OTHER</b>								
POLES	70% Recovery	316	316	-	-	446	446	762
CHARCOAL TIMBER		-	-	400	472	-	872	872
<b>TOTAL CONSUMED IN RSA</b>		<b>3,267</b>	<b>3,267</b>	<b>1,714</b>	<b>4,626</b>	<b>7,982</b>	<b>14,322</b>	<b>17,589</b>
Less								
Swaziland		25	25	10	-	100	110	135
Zimbabwe		-	-	56	-	-	56	56
Namibia		-	-	-	80	-	80	80
<b>TOTAL DEMAND FOR RSA</b>		<b>3,242</b>	<b>3,242</b>	<b>1,648</b>	<b>4,546</b>	<b>7,882</b>	<b>14,076</b>	<b>17,318</b>
Waste excluded								688

**NOTES:**

CHANGES FROM 2007

1. First phase of production NCT/Sodra pulpmill - international pulp company.
2. Mining Timber reduced by 50,000 tons per annum.

2009 ROUNDWOOD DEMAND OTHER THAN FOR SAWLOGS ('000 tons - rounded to the closest 1,000 tons)							
	SOFTWOOD	SUB TOTAL	Wattle	HARDWOOD		SUB TOTAL	TOTAL
				Logs	Hard Gum		
<b>PULP AND PAPER</b>							
Sappi	Enstra	-	-	280	-	280	280
	Ngodwana	1,000	1,000	250	700	950	1,950
	Mandini	800	800	220	-	220	1,020
	Saiccor	-	-	190	200	1,950	2,340
Mondi	Richards Bay	431	431	-	1,421	1,050	2,471
	Merebank	485	485	-	-	-	485
	Piet Retief	-	-	-	70	70	70
NCT	Richards Bay	-	-	-	450	450	450
<b>Sub Total</b>		<b>2,716</b>	<b>2,716</b>	<b>190</b>	<b>2,371</b>	<b>4,220</b>	<b>6,781</b>
<b>BOARD MILLS</b>							
Masonite		-	-	-	200	200	200
Sonae	White River	13	13	-	80	80	93
	Panbult	43	43	-	65	65	108
	George	8	8	-	-	-	8
PG Bison	Piet Retief	-	-	-	40	40	80
	Pietermaritzburg	37	37	-	10	54	101
	Stellenbosch	18	18	-	10	-	28
	Boksburg	-	-	-	-	60	60
Chipboard Industries	near Langeni	66	66	-	-	-	66
	Umtata	50	50	-	-	-	50
<b>Sub Total</b>		<b>235</b>	<b>235</b>	<b>-</b>	<b>125</b>	<b>434</b>	<b>794</b>
<b>CHIPPING PLANTS</b>							
CTC	Richards Bay	-	-	700	527	1,173	2,400
Silvacel		-	-	324	871	720	1,915
Shincell		-	-	100	60	460	620
NCT	Durban	-	-	-	-	120	120
<b>Sub Total</b>		<b>-</b>	<b>-</b>	<b>1,124</b>	<b>1,458</b>	<b>2,473</b>	<b>5,055</b>
<b>MINING TIMBER</b>							
		-	-	-	200	400	600
<b>EXPORTS</b>							
		-	-	-	-	-	-
<b>Sub Total</b>		<b>-</b>	<b>-</b>	<b>-</b>	<b>200</b>	<b>400</b>	<b>600</b>
<b>OTHER</b>							
POLES	70% Recovery	316	316	-	-	446	762
CHARCOAL TIMBER		-	-	375	393	-	768
<b>TOTAL CONSUMED IN RSA</b>		<b>3,267</b>	<b>3,267</b>	<b>1,689</b>	<b>4,547</b>	<b>7,973</b>	<b>14,209</b>
Less							
Swaziland		25	25	10	-	100	135
Zimbabwe		-	-	56	-	-	56
Namibia		-	-	-	80	-	80
<b>TOTAL DEMAND FOR RSA</b>		<b>3,242</b>	<b>3,242</b>	<b>1,623</b>	<b>4,467</b>	<b>7,873</b>	<b>13,963</b>
Waste excluded							688

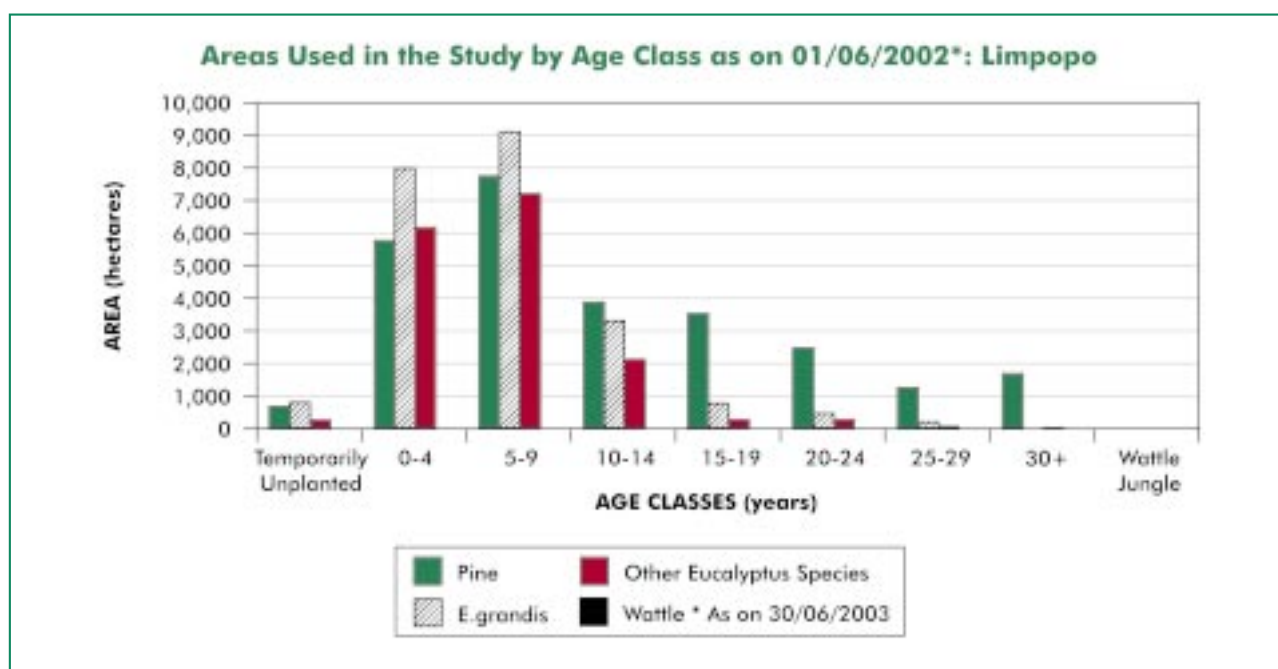
**NOTES:**

CHANGES FROM 2008

1. NCT/Sodra pulpmill up to full production.
2. Mining Timber reduced to the expected sustainable level of 600,000 tons.

**AREAS USED IN THE STUDY IN HECTARES BY GENUS AND AGE CLASS IN FIVE YEAR AGE GROUPINGS ON 01/06/2002\*:  
LIMPOPO REGION**

Age in Years	Pine	E.grandis	Other Eucalyptus Species	Wattle * As on 30/06/2003	TOTAL
Temporarily Unplanted	680	777	227	-	1,684
0 - 4	5,785	7,978	6,133	-	19,897
5 - 9	7,771	9,071	7,208	-	24,050
10 - 14	3,914	3,286	2,070	-	9,270
15 - 19	3,557	832	249	-	4,638
20 - 24	2,487	404	247	-	3,138
25 - 29	1,272	170	51	-	1,494
30 +	1,642	18	32	-	1,693
Wattle Jungle	-	-	-	-	-
<b>TOTALS</b>	<b>27,108</b>	<b>22,537</b>	<b>16,219</b>	-	<b>65,863</b>



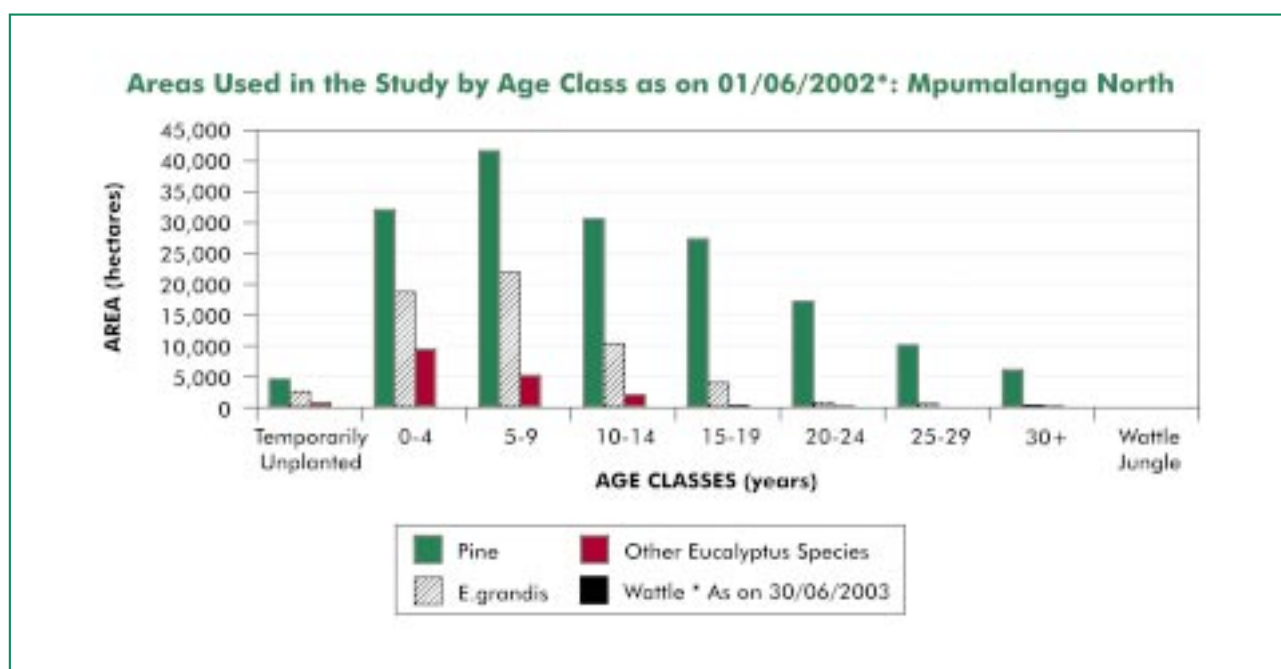
SOURCE: Report on Commercial Timber Resources and Primary Roundwood Processing in South Africa 2001/2002.

Areas Excluded: Jungle (except the Wattle Jungle areas which were estimated), and Pine grown for "Other Products" in the Southern and Western Cape Regions.

Wattle regions were based on Extract Factory or Collection Depot location.

\* Wattle as on 30/06/2003.

AREAS USED IN THE STUDY IN HECTARES BY GENUS AND AGE CLASS IN FIVE YEAR AGE GROUPINGS ON 01/06/2002*: MPUMALANGA NORTH REGION					
Age in Years	Pine	E.grandis	Other Eucalyptus Species	Wattle * As on 30/06/2003	TOTAL
Temporarily Unplanted	4,664	2,533	505	-	7,702
0 - 4	32,006	18,932	9,494	-	60,432
5 - 9	41,337	21,993	5,199	-	68,530
10 - 14	30,598	10,446	1,890	-	42,935
15 - 19	27,164	4,106	168	-	31,437
20 - 24	17,221	448	87	-	17,756
25 - 29	10,216	359	32	-	10,607
30 +	3,162	269	178	-	3,609
Wattle Jungle	-	-	-	-	-
<b>TOTALS</b>	<b>166,368</b>	<b>59,086</b>	<b>17,553</b>	<b>-</b>	<b>243,007</b>



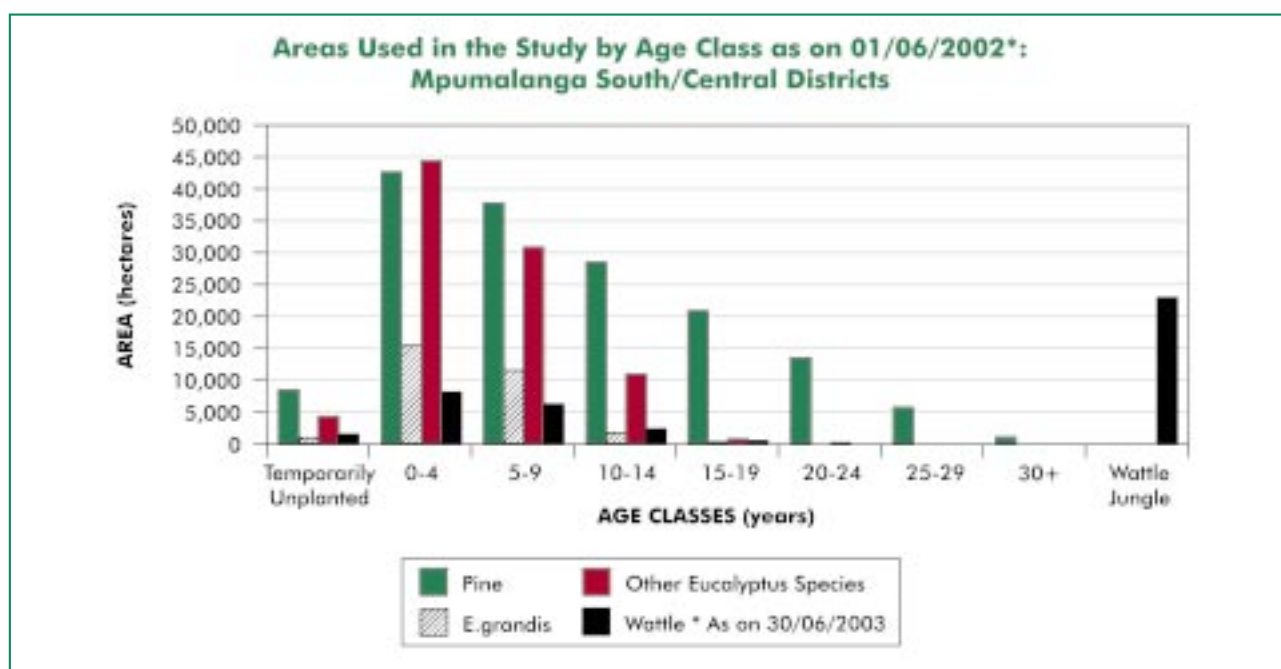
SOURCE: Report on Commercial Timber Resources and Primary Roundwood Processing in South Africa 2001/2002.

Areas Excluded: Jungle (except the Wattle Jungle areas which were estimated), and Pine grown for "Other Products" in the Southern and Western Cape Regions.

Wattle regions were based on Extract Factory or Collection Depot location.

\* Wattle as on 30/06/2003.

AREAS USED IN THE STUDY IN HECTARES BY GENUS AND AGE CLASS IN FIVE YEAR AGE GROUPINGS ON 01/06/2002*: MPUMALANGA SOUTH/CENTRAL DISTRICTS REGION					
Age in Years	Pine	E.grandis	Other Eucalyptus Species	Wattle * As on 30/06/2003	TOTAL
Temporarily Unplanted	8,612	1,001	4,331	1,525	15,469
0 - 4	42,606	15,504	44,464	8,242	110,817
5 - 9	37,769	11,728	30,914	6,108	86,519
10 - 14	28,693	1,561	11,141	1,782	43,177
15 - 19	20,803	216	876	399	22,294
20 - 24	13,399	7	140	-	13,545
25 - 29	5,741	-	47	-	5,788
30 +	924	13	5	-	943
Wattle Jungle	-	-	-	23,100	23,100
<b>TOTALS</b>	<b>158,547</b>	<b>30,030</b>	<b>91,917</b>	<b>41,156</b>	<b>321,650</b>



SOURCE: Report on Commercial Timber Resources and Primary Roundwood Processing in South Africa 2001/2002.

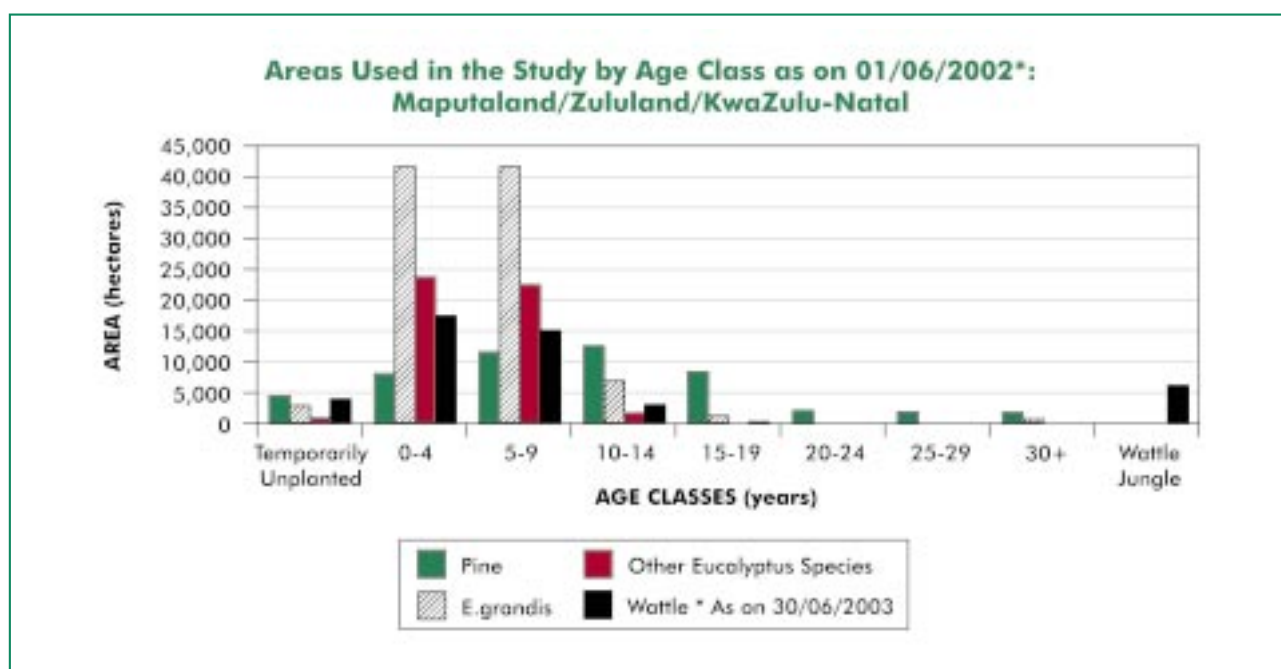
Areas Excluded: Jungle (except the Wattle Jungle areas which were estimated), and Pine grown for "Other Products" in the Southern and Western Cape Regions.

Wattle regions were based on Extract Factory or Collection Depot location.

\* Wattle as on 30/06/2003.

**AREAS USED IN THE STUDY IN HECTARES BY GENUS AND AGE CLASS IN FIVE YEAR AGE GROUPINGS ON 01/06/2002\*:  
MAPUTALAND/ZULULAND/NORTHERN KWAZULU-NATAL REGION**

Age in Years	Pine	E.grandis	Other Eucalyptus Species	Wattle * As on 30/06/2003	TOTAL
Temporarily Unplanted	4,475	2,642	607	3,724	11,449
0 - 4	8,145	41,499	23,853	17,362	90,859
5 - 9	11,598	41,364	22,364	15,088	90,413
10 - 14	12,525	6,904	1,518	2,762	23,709
15 - 19	8,353	951	7	129	9,439
20 - 24	1,891	25	-	-	1,916
25 - 29	1,707	6	6	-	1,719
30 +	1,351	563	38	-	1,952
Wattle Jungle	-	-	-	6,000	6,000
<b>TOTALS</b>	<b>50,045</b>	<b>93,953</b>	<b>48,393</b>	<b>45,065</b>	<b>237,456</b>



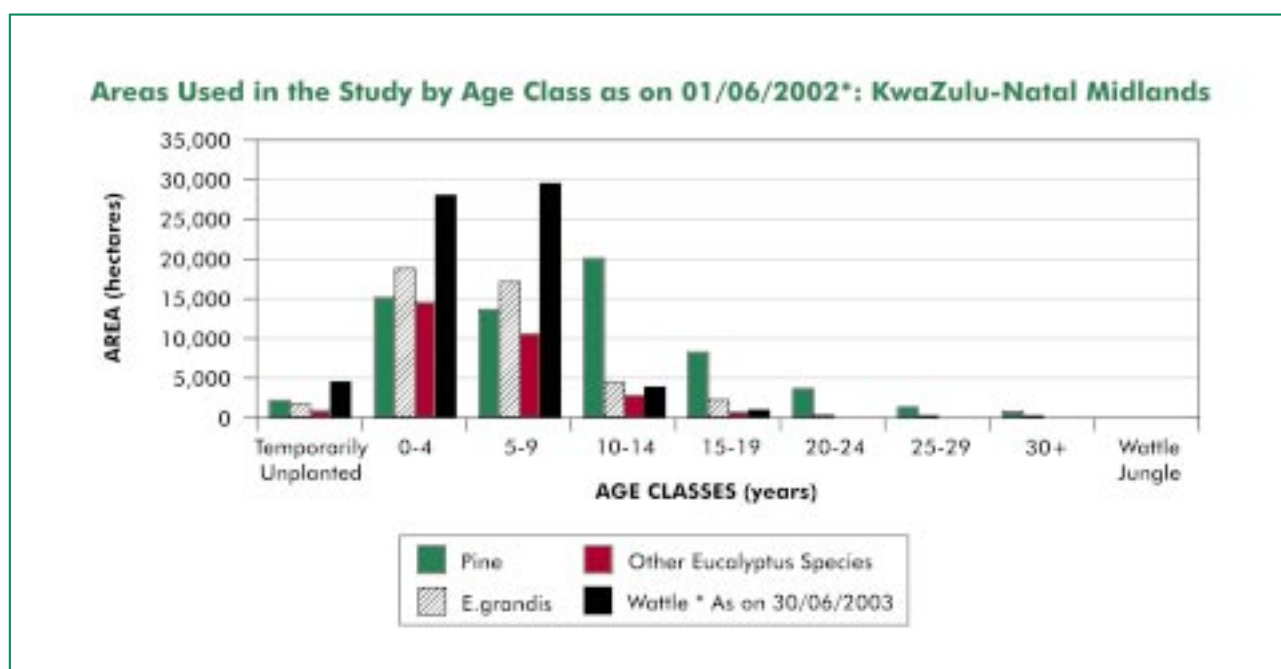
SOURCE: Report on Commercial Timber Resources and Primary Roundwood Processing in South Africa 2001/2002.

Areas Excluded: Jungle (except the Wattle Jungle areas which were estimated), and Pine grown for "Other Products" in the Southern and Western Cape Regions.

Wattle regions were based on Extract Factory or Collection Depot location.

\* Wattle as on 30/06/2003.

AREAS USED IN THE STUDY IN HECTARES BY GENUS AND AGE CLASS IN FIVE YEAR AGE GROUPINGS ON 01/06/2002*: KWAZULU-NATAL MIDLANDS REGION					
Age in Years	Pine	E.grandis	Other Eucalyptus Species	Wattle * As on 30/06/2003	TOTAL
Temporarily Unplanted	2,027	1,492	733	4,553	8,805
0 - 4	15,094	18,736	14,524	27,949	76,303
5 - 9	13,660	17,110	10,943	29,565	71,278
10 - 14	20,121	4,503	2,765	4,157	31,546
15 - 19	8,076	1,753	356	541	10,726
20 - 24	3,820	295	15	-	4,130
25 - 29	893	213	3	-	1,109
30 +	584	187	21	-	791
Wattle Jungle	-	-	-	-	-
<b>TOTALS</b>	<b>64,274</b>	<b>44,289</b>	<b>29,360</b>	<b>66,765</b>	<b>204,688</b>



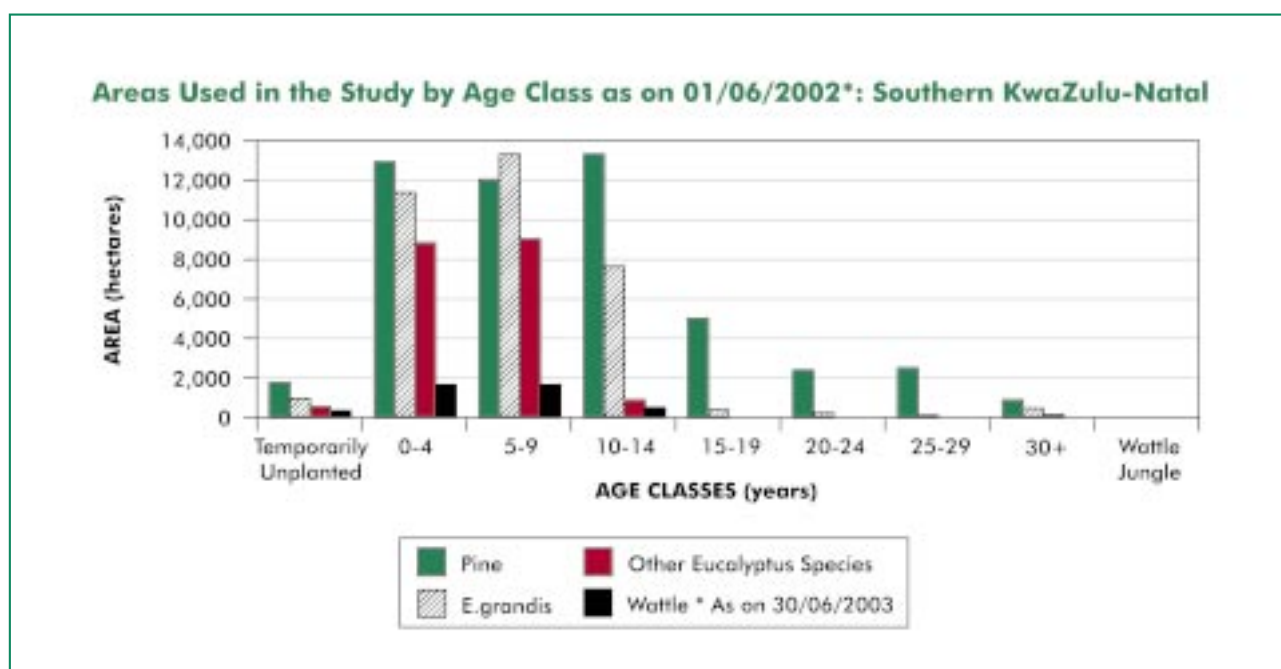
SOURCE: Report on Commercial Timber Resources and Primary Roundwood Processing in South Africa 2001/2002.

Areas Excluded: Jungle (except the Wattle Jungle areas which were estimated), and Pine grown for "Other Products" in the Southern and Western Cape Regions.

Wattle regions were based on Extract Factory or Collection Depot location.

\* Wattle as on 30/06/2003.

AREAS USED IN THE STUDY IN HECTARES BY GENUS AND AGE CLASS IN FIVE YEAR AGE GROUPINGS ON 01/06/2002*: SOUTHERN KWAZULU-NATAL REGION					
Age in Years	Pine	E.grandis	Other Eucalyptus Species	Wattle * As on 30/06/2003	TOTAL
Temporarily Unplanted	1,798	894	397	276	3,364
0 - 4	12,765	11,392	8,853	1,689	34,699
5 - 9	12,029	13,187	9,045	1,703	35,964
10 - 14	13,145	7,572	823	481	22,021
15 - 19	4,951	363	18	14	5,346
20 - 24	2,370	212	2	-	2,584
25 - 29	2,433	82	2	-	2,517
30 +	851	416	91	-	1,358
Wattle Jungle	-	-	-	-	-
<b>TOTALS</b>	<b>50,342</b>	<b>34,118</b>	<b>19,231</b>	<b>4,163</b>	<b>107,853</b>



SOURCE: Report on Commercial Timber Resources and Primary Roundwood Processing in South Africa 2001/2002.

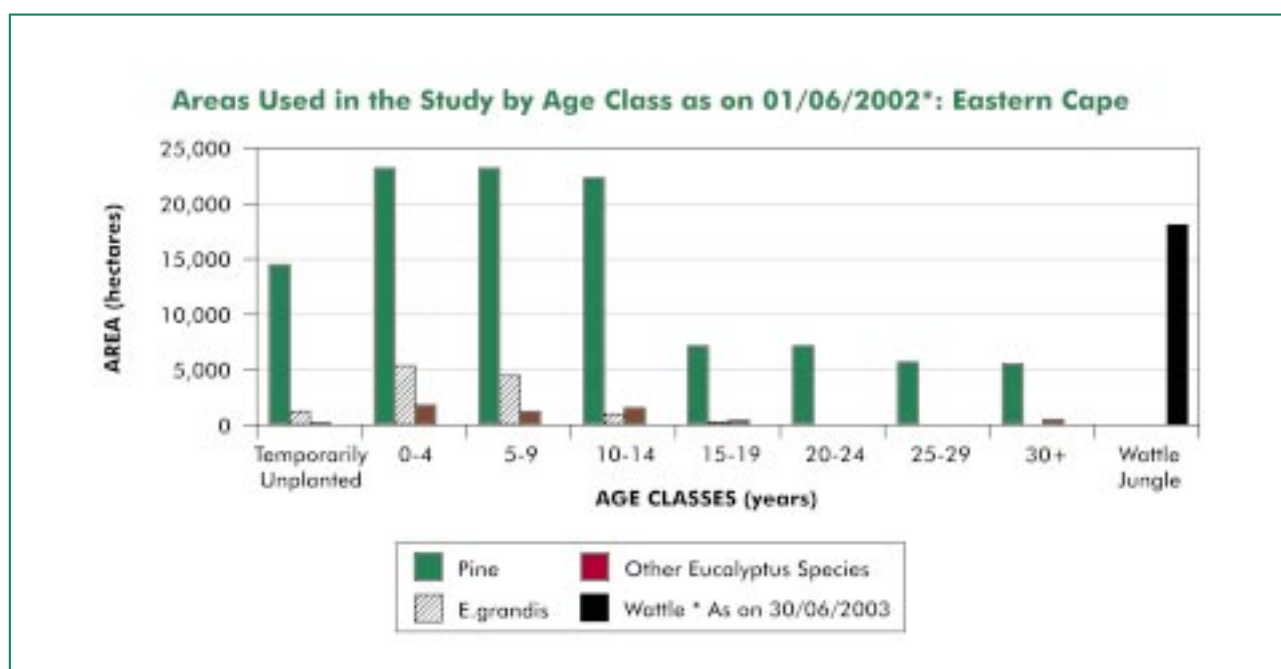
Areas Excluded: Jungle (except the Wattle Jungle areas which were estimated), and Pine grown for "Other Products" in the Southern and Western Cape Regions.

Wattle regions were based on Extract Factory or Collection Depot location.

\* Wattle as on 30/06/2003.

**AREAS USED IN THE STUDY IN HECTARES BY GENUS AND AGE CLASS IN FIVE YEAR AGE GROUPINGS ON 01/06/2002\*:  
EASTERN CAPE REGION**

Age in Years	Pine	E.grandis	Other Eucalyptus Species	Wattle * As on 30/06/2003	TOTAL
Temporarily Unplanted	14,571	865	108	-	15,544
0 - 4	23,354	5,379	1,586	-	30,319
5 - 9	23,278	4,360	867	-	28,505
10 - 14	22,364	696	1,088	-	24,148
15 - 19	7,216	143	270	-	7,629
20 - 24	7,218	16	30	-	7,264
25 - 29	5,481	54	11	-	5,546
30 +	5,260	44	217	-	5,521
Wattle Jungle	-	-	-	18,000	18,000
<b>TOTALS</b>	<b>108,740</b>	<b>11,558</b>	<b>4,177</b>	<b>18,000</b>	<b>142,476</b>



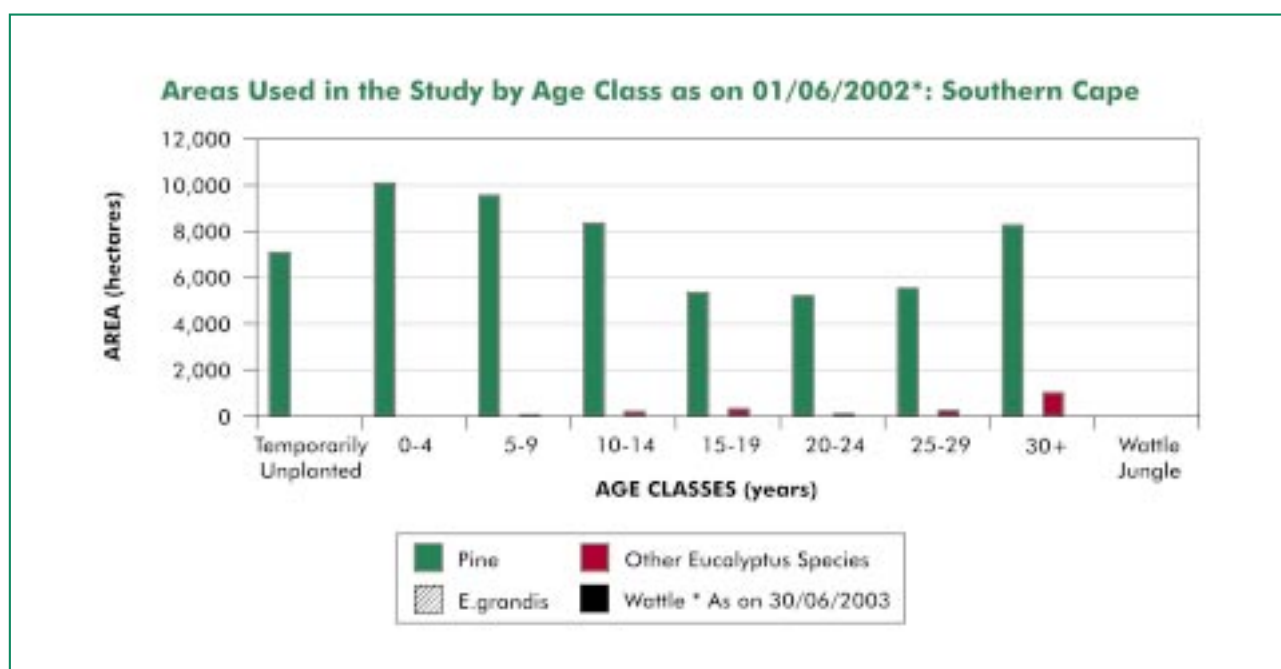
SOURCE: Report on Commercial Timber Resources and Primary Roundwood Processing in South Africa 2001/2002.

Areas Excluded: Jungle (except the Wattle Jungle areas which were estimated), and Pine grown for "Other Products" in the Southern and Western Cape Regions.

Wattle regions were based on Extract Factory or Collection Depot location.

\* Wattle as on 30/06/2003.

AREAS USED IN THE STUDY IN HECTARES BY GENUS AND AGE CLASS IN FIVE YEAR AGE GROUPINGS ON 01/06/2002*: SOUTHERN CAPE REGION					
Age in Years	Pine	E.grandis	Other Eucalyptus Species	Wattle * As on 30/06/2003	TOTAL
Temporarily Unplanted	7,024	5	-	-	7,029
0 - 4	10,066	-	9	-	10,074
5 - 9	9,637	-	29	-	9,666
10 - 14	8,191	-	140	-	8,330
15 - 19	5,319	-	214	-	5,533
20 - 24	5,108	-	71	-	5,180
25 - 29	5,368	12	134	-	5,513
30 +	8,137	2	927	-	9,066
Wattle Jungle	-	-	-	-	-
<b>TOTALS</b>	<b>58,849</b>	<b>19</b>	<b>1,523</b>	<b>-</b>	<b>60,392</b>



SOURCE: Report on Commercial Timber Resources and Primary Roundwood Processing in South Africa 2001/2002.

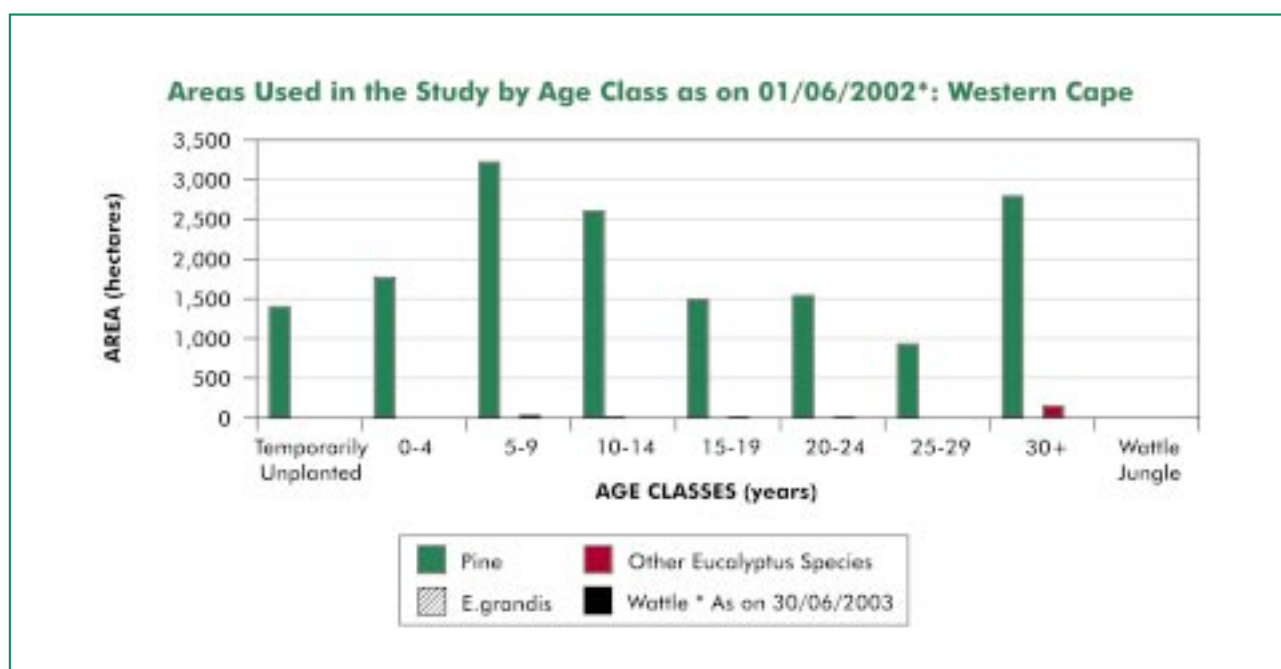
Areas Excluded: Jungle (except the Wattle Jungle areas which were estimated), and Pine grown for "Other Products" in the Southern and Western Cape Regions.

Wattle regions were based on Extract Factory or Collection Depot location.

\* Wattle as on 30/06/2003.

**AREAS USED IN THE STUDY IN HECTARES BY GENUS AND AGE CLASS IN FIVE YEAR AGE GROUPINGS ON 01/06/2002\*:  
WESTERN CAPE REGION**

Age in Years	Pine	E.grandis	Other Eucalyptus Species	Wattle * As on 30/06/2003	TOTAL
Temporarily Unplanted	1,403	-	-	-	1,403
0 - 4	1,748	1	-	-	1,749
5 - 9	3,176	-	18	-	3,193
10 - 14	2,602	4	-	-	2,606
15 - 19	1,493	-	8	-	1,500
20 - 24	1,534	-	8	-	1,542
25 - 29	932	-	-	-	932
30 +	2,772	5	151	-	2,928
Wattle Jungle	-	-	-	-	-
TOTALS	15,660	10	184	-	15,854



SOURCE: Report on Commercial Timber Resources and Primary Roundwood Processing in South Africa 2001/2002.

Areas Excluded: Jungle (except the Wattle Jungle areas which were estimated), and Pine grown for "Other Products" in the Southern and Western Cape Regions.

Wattle regions were based on Extract Factory or Collection Depot location.

\* Wattle as on 30/06/2003.

VOLUME : MASS AND MASS : VOLUME CONVERSION RATIOS							
Industrial Roundwood Type		Ratios Used in this Study			Historically Accepted Ratios		
		m <sup>3</sup> per ton	tons per m <sup>3</sup>	Notes	m <sup>3</sup> per ton	tons per m <sup>3</sup>	Notes
Softwood:	Sawlogs	0.94	1.06		0.94	1.06	
	Pulpwood	1.00	1.00		1.00	1.00	
	Poles@	1.00	1.00		1.00	1.00	
	Other Products@	1.00	1.00		1.00	1.00	
E.grandis:	Sawlogs	0.94	1.06	3 weeks air dry	0.94	1.06	6 weeks air dry
	Pulpwood	1.37	0.73	3 weeks air dry	1.47	0.68	6 weeks air dry
	Mining Timber@	1.37	0.73	3 weeks air dry	1.47	0.68	6 weeks air dry
	Poles@	1.37	0.73	3 weeks air dry	1.47	0.68	6 weeks air dry
	Other Products@	1.37	0.73	3 weeks air dry	1.47	0.68	6 weeks air dry
Other Eucalypts:	Sawlogs	0.78	1.28	3 weeks air dry	0.78	1.28	6 weeks air dry
	Pulpwood	1.16	0.86	3 weeks air dry	1.25	0.80	6 weeks air dry
	Mining Timber@	1.16	0.86	3 weeks air dry	1.25	0.80	6 weeks air dry
	Poles@	1.16	0.86	3 weeks air dry	1.25	0.80	6 weeks air dry
	Other Products@	1.16	0.86	3 weeks air dry	1.25	0.80	6 weeks air dry
Wattle:	Pulpwood	1.138	0.879	6 weeks air dry	1.138	0.879	6 weeks air dry
	Mining Timber@	1.138	0.879	6 weeks air dry	1.138	0.879	6 weeks air dry
	Poles@	1.138	0.879	6 weeks air dry	1.138	0.879	6 weeks air dry
	Other Products@	1.138	0.879	6 weeks air dry	1.138	0.879	6 weeks air dry

@ assumed for the purposes of this study.

REGION	SUMMARY OF STUDY DETAILS			
	Area Excluded: Jungle: (All Timber Types except Wattle)	Total Area Included in Study (including additional Wattle Jungle Areas)	Total Area per Region (including additional Wattle Jungle Areas)	% of the Total Area Included in the Study
Limpopo	58	65,864	66,807	98.6%
Mpumalanga North	412	243,007	243,669	99.7%
Central Districts	61	19,310	19,387	99.6%
Mpumalanga South	110	302,340	304,934	99.1%
Totals/Wtd. Averages: Central Districts/ Mpumalanga South	171	321,650	324,321	99.2%
Maputaland	-	19,320	19,336	99.9%
Zululand	30	118,054	119,636	98.7%
Northern KwaZulu-Natal	168	99,979	100,458	99.5%
Totals/Wtd. Averages: Maputaland/Zululand/ Northern KwaZulu-Natal	198	237,353	239,430	99.1%
KwaZulu-Natal Midlands	66	204,790	205,910	99.5%
Southern KwaZulu-Natal	35	107,855	108,143	99.7%
Eastern Cape	449	142,477	143,434	99.3%
Southern Cape	77	60,392	63,802	94.7%
Western Cape	619	15,854	18,543	85.5%
Total and weighted averages	2,086	1,399,242	1,414,059	99.0%

**NOTES:**

Source(Unless otherwise stated): Report on Commercial Timber Resources and Primary Roundwood Processing in South Africa: 2001/2002.

Areas in shaded columns were excluded.

N/A: Not Applicable

Wattle areas (except jungle areas) were obtained from industry sources and inserted on a pro rata basis based on Commercial Timber Resource areas.

The Wattle jungle area of 47,100 hectares is an estimate and was not obtained from the Report on Commercial Timber Resources and Primary Roundwood Processing in South Africa: 2001/2002.

Mean annual increment figures for Pine sawlog and Eucalyptus sawlog areas were calculated using the pulpwood conversion ratios as the product to be removed from the yields will be pulpwood and not sawlogs.

SUMMARY: ALL AREAS EXCEPT SAWLOG AND WATTLE JUNGLE AREAS:				
Timber Type:	Softwood	E.grandis	Other Eucalypts	Wattle
%:	25.8%	32.6%	26.6%	15.0%
Area: (ha)	220,379	279,096	227,489	128,049
MAI:(t/ha/yr)	14.612	17.966	19.568	8.066
MAI:(m <sup>3</sup> /ha/yr)	14.612	24.614	22.698	9.179
Total Area:	855,013	Total MAI: t/ha/yr	16.045	
		Total MAI: m <sup>3</sup> /ha/yr	19.215	

AREAS MAIs AND ROTATION AGES USED IN THE STUDY BY PRODUCT TYPE															
SOFTWOOD															
REGION	Sawlog					Pulpwood					Poles			Other Products	
	Area	Average Mean Annual Increment at Clearfelling Age (Tons/ha/year)	Rotation Applied	Area	Rotation Applied	Area	Average Mean Annual Increment at Clearfelling Age (Tons/ha/year)	Rotation Applied	Area	Average Mean Annual Increment at Clearfelling Age (Tons/ha/year)	Rotation Applied	Area	Average Mean Annual Increment at Clearfelling Age (Tons/ha/year)	Rotation Applied	
	hectares	tons	years	hectares	years	hectares	tons	years	hectares	tons	years	hectares	tons	years	
Limpopo	26,179	16.0	28	952	18	35	16.0	18	-	18	-	16.0	18	28	
Mpumalanga North	135,899	16.5	28	30,744	18	-	15.0	18	-	18	-	15.0	18	28	
Central Districts	3,423	15.0	28	12,649	18	-	9.0	18	-	18	-	9.0	18	28	
Mpumalanga South	67,386	17.0	28	75,118	18	-	15.0	18	-	18	-	15.0	18	28	
Totals/Wtd. Averages: Central Districts/Mpumalanga South	70,809	16.9	28	87,767	18	-	14.1	18	-	18	-	0.0	18	28	
Maputaland	5,771	11.0	28	4,496	18	-	8.0	18	-	18	-	8.0	18	28	
Zululand	13,828	15.0	28	8,778	18	-	13.5	18	-	18	-	13.5	18	28	
Northern KwaZulu-Natal	10,742	17.0	28	6,479	18	-	15.0	18	-	18	-	15.0	18	28	
Totals/Wtd. Averages: Maputaland/Zululand/ Northern KwaZulu-Natal	30,341	14.9	28	19,753	18	-	12.7	18	-	18	-	0.0	18	28	
KwaZulu-Natal Midlands	22,000	16.0	28	42,150	18	146	16.0	18	146	18	5	16.0	18	28	
Southern KwaZulu-Natal	25,763	16.5	28	24,576	18	-	15.0	18	-	18	-	15.0	18	28	
Eastern Cape	95,539	16.0	28	9,853	18	3511	14.5	18	3511	18	12	14.5	18	28	
Southern Cape	58,652	13.0	28	3	18	272	13.0	18	272	18	2,381	13.0	18	28	
Western Cape	15,485	14.5	28	2	18	590	13.5	18	590	18	1,790	14.5	18	28	
Total and weighted averages	480,667	15.8	(X 0.94)	215,800	(X 1.00)	4,554	14.6	(X 1.00)	4,554	(X 1.00)	14,340	13.7	(X 1.00)	(X 1.00)	

SUMMARY: SOFTWOOD AREAS:		
Subdivision:	Excl. Sawlogs	Incl. Sawlogs
%	31%	100%
Area: (ha)	220,379	701,046
MAI:(t/ha/yr)	14.612	15.441
MAI:(m <sup>3</sup> /ha/yr)	14.612	14.790

**NOTES:**  
 Source(Unless otherwise stated): Report on Commercial Timber Resources and Primary Roundwood Processing in South Africa: 2001/2002.  
 Areas in shaded columns were excluded.  
 N/A: Not Applicable  
 Wattle areas (except jungle areas) were obtained from industry sources and inserted on a pro rata basis based on Commercial Timber Resource areas.  
 The Wattle jungle area of 47,100 hectares is an estimate and was not obtained from the Report on Commercial Timber Resources and Primary Roundwood Processing in South Africa: 2001/2002.  
 Mean annual increment figures for Pine sawlog and Eucalyptus sawlog areas were calculated using the pulpwood conversion ratios as the product to be removed from the yields will be pulpwood and not sawlogs.

AREAS MAIs AND ROTATION AGES USED IN THE STUDY BY PRODUCT TYPE															
REGION	E-GRANDIS														
	Sawlog			Pulpwood			Mining Timber			Poles			Other Purposes		
	Area hectares	Average Mean Annual Increment at Clearfelling Age (Tons/ha/year)	Rotation Applied years	Area hectares	Average Mean Annual Increment at Clearfelling Age (Tons/ha/year)	Rotation Applied years	Area hectares	Average Mean Annual Increment at Clearfelling Age (Tons/ha/year)	Rotation Applied years	Area hectares	Average Mean Annual Increment at Clearfelling Age (Tons/ha/year)	Rotation Applied years	Area hectares	Average Mean Annual Increment at Clearfelling Age (Tons/ha/year)	Rotation Applied years
Limpopo	7,722	25.5	25	2,973	19.4	9	7,703	19.4	9	3,208	19.4	9	931	19.4	9
Mpumalanga North	8,269	25.5	25	20,868	21.8	9	29,084	21.8	9	811	21.8	9	131	21.8	9
Central Districts	-	8.0	25	1,232	9.4	9	-	9.4	9	-	9.4	9	-	9.4	9
Mpumalanga South	114	13.5	25	24,772	15.9	9	3,796	15.9	9	115	15.9	9	8	15.9	9
Totals/Wtd. Averages: Central Districts/Mpumalanga South	114	13.5	25	26,004	15.6	9	3,796	15.9	9	115	15.9	9	8	15.9	9
Maputaland	-	-	25	8,421	12.9	9	-	12.9	9	-	12.9	9	7	12.9	9
Zululand	480	21.9	25	64,139	21.0	9	-	21.0	9	-	21.0	9	5	21.0	9
Northern KwaZulu-Natal	11	13.5	25	20,092	15.9	9	716	15.9	9	69	15.9	9	43	15.9	9
Totals/Wtd. Averages: Maputaland/Zululand/Northern KwaZulu-Natal	491	21.7	25	92,652	19.2	9	716	15.9	9	69	15.9	9	55	16.0	10
KwaZulu-Natal Midlands	105	14.3	25	43,298	16.9	9	286	16.9	9	640	16.9	9	1	16.9	9
Southern KwaZulu-Natal	75	12.5	25	33,271	14.8	9	138	14.8	9	647	14.8	9	7	14.8	9
Eastern Cape	4	8.0	25	931	9.4	9	188	9.4	9	10,387	9.4	9	149	9.4	9
Southern Cape	-	-	25	14	9.4	9	5	9.4	9	-	9.4	9	-	9.4	9
Western Cape	-	-	25	-	9.4	9	-	9.4	9	5	9.4	9	5	9.4	9
Total and weighted averages	16,780	25.2	(X 0.94)	220,011	17.8	(X 1.37)	41,916	20.6	(X 1.37)	28,257	12.7	(X 1.37)	1,287	18.2	(X 1.37)
	m <sup>2</sup> /ha/yr:	23.665		24.442						17.352				24.971	

**NOTES:**

Source(Unless otherwise stated): Report on Commercial Timber Resources and Primary Roundwood Processing in South Africa: 2001/2002.

Areas in shaded columns were excluded.

N/A: Not Applicable

Wattle areas (except jungle areas) were obtained from industry sources and inserted on a pro rata basis based on Commercial Timber Resource areas.

The Wattle jungle area of 47,100 hectares is an estimate and was not obtained from the Report on Commercial Timber Resources and Primary Roundwood Processing in South Africa: 2001/2002.

Mean annual increment figures for Pine sawlog and Eucalyptus sawlog areas were calculated using the pulpwood conversion ratios as the product to be removed from the yields will be pulpwood and not sawlogs

SUMMARY: E-GRANDIS:					SUMMARY: EUCALYPTUS SAWLOG AREAS:				
Subdivision:	All Timber	E-grandis	E-div.	Total	Subdivision:	E-grandis	E-div.	Total	
%	100%				%				
Area: (ha)	295,876	16,780	907	17,687	Area: (ha)	16,780	907	17,687	
MAI:(t/ha/yr)	18.375	25.2	12.9	24.55	MAI:(t/ha/yr)	25.2	12.9	24.55	
MAI:(m <sup>3</sup> /ha/yr)	24.560	23.665	10.062		MAI:(m <sup>3</sup> /ha/yr)	23.665	10.062		

AREAS MAIs AND ROTATION AGES USED IN THE STUDY BY PRODUCT TYPE																		
OTHER EUCALYPTUS SPECIES																		
REGION	Sawlog***			E. diversicolor Sawlog			Pulpwood			Mining Timber			Poles			Other Purposes		
	Area hectares	Average Mean Annual Increment at Clearfelling Age (Tons/ha/year)	Rotation Applied years	Area hectares	Average Mean Annual Increment at Clearfelling Age (Tons/ha/year)	Rotation Applied years	Area hectares	Average Mean Annual Increment at Clearfelling Age (Tons/ha/year)	Rotation Applied years	Area hectares	Average Mean Annual Increment at Clearfelling Age (Tons/ha/year)	Rotation Applied years	Area hectares	Average Mean Annual Increment at Clearfelling Age (Tons/ha/year)	Rotation Applied years	Area hectares	Average Mean Annual Increment at Clearfelling Age (Tons/ha/year)	Rotation Applied years
Limpopo	17	-	-	10,287	15.7	9	3,491	15.7	9	1,938	15.7	9	486	15.7	9	15.7	9	
Mpumalanga North	279	-	-	15,077	20.1	9	1,830	20.1	9	306	20.1	9	121	20.1	9	20.1	9	
Central Districts	-	-	-	1,063	8.3	9	999	8.3	9	-	8.3	9	-	8.3	9	8.3	9	
Mpumalanga South	217	-	-	87,019	21.2	9	1,634	21.2	9	-	21.2	9	1,115	21.2	9	21.2	9	
Totals/Wtd. Averages: Central Districts/ Mpumalanga South	217	-	-	88,082	21.1	9	2,633	16.3	9	-	0.0	9	1,115	21.2	9	21.2	9	
Maputaland	-	-	-	622	8.3	9	-	8.3	9	-	8.3	9	3	8.3	9	8.3	9	
Zululand	-	-	-	26,523	21.0	9	-	21.0	9	-	21.0	9	-	21.0	9	21.0	9	
Northern KwaZulu-Natal	-	-	-	20,954	17.8	9	67	17.8	9	240	17.8	9	-	17.8	9	17.8	9	
Totals/Wtd. Averages: Maputaland/Zululand/ Northern KwaZulu-Natal	-	-	-	48,099	19.5	9	67	17.8	9	240	17.8	9	3	8.3	9	8.3	9	
KwaZulu-Natal Midlands	190	-	-	28,976	18.9	9	289	18.9	9	5	18.9	9	-	18.9	9	18.9	9	
Southern KwaZulu-Natal	87	-	-	18,944	17.7	9	60	17.7	9	156	17.7	9	-	17.7	9	17.7	9	
Eastern Cape	70	-	-	1,469	17.7	9	30	17.7	9	2,618	17.7	9	165	17.7	9	17.7	9	
Southern Cape	-	-	-	879	12.9	25	639	17.7	9	-	17.7	9	5	17.7	9	17.7	9	
Western Cape	-	-	-	28	12.9	25	5	15.9	9	24	15.9	9	329	15.9	9	15.9	9	
Total and weighted averages	860	0.0	-	211,578	19.7	-	8,400	17.0	-	5,287	17.1	-	2,224	18.9	-	18.9	-	
	m³/ha/yr:	0.000	(X 0.94)		10.062	(X 0.78)		22.897	(X 1.16)		19.706	(X 1.16)		19.836	(X 1.16)		21.913	(X 1.16)

SUMMARY: EUCALYPTUS AREAS: INCLUDING SAWLOGS:						SUMMARY: EUCALYPTUS AREAS: EXCLUDING SAWLOGS:					
Subdivision:	E. grandis %	Other Eucalypts %	Total %	Subdivision:	E. grandis %	Other Eucalypts %	Total %	Subdivision:	E. grandis %	Other Eucalypts %	Total %
Area: (ha)	295,876	228,396	524,272	Area: (ha)	279,096	227,489	506,585	Area: (ha)	279,096	227,489	506,585
MAI:(t/ha/yr)	18.375	19.541	18.883	MAI:(t/ha/yr)	17.966	19.568	18.685	MAI:(t/ha/yr)	17.966	19.568	18.685
MAI:(m³/ha/yr)	24.560	22.648	23.727	MAI:(m³/ha/yr)	24.61	22.698	23.754	MAI:(m³/ha/yr)	24.61	22.698	23.754

Sawlogs\*\*\* excluded from summary.

**NOTES:**  
 Source(Unless otherwise stated): Report on Commercial Timber Resources and Primary Roundwood Processing in South Africa: 2001/2002.  
 Areas in shaded columns were excluded.  
 N/A: Not Applicable  
 Wattle areas (except jungle areas) were obtained from industry sources and inserted on a pro rata basis based on Commercial Timber Resource areas.  
 The Wattle jungle area of 47,100 hectares is an estimate and was not obtained from the Report on Commercial Timber Resources and Primary Roundwood Processing in South Africa: 2001/2002.  
 Mean annual increment figures for Pine sawlog and Eucalyptus sawlog areas were calculated using the pulpwood conversion ratios as the product to be removed from the yields will be pulpwood and not sawlogs

AREAS MAIs AND ROTATION AGES USED IN THE STUDY BY PRODUCT TYPE																			
WATTLE																			
REGION	Pulpwood				Mining Timber				Poles			Other Purposes			Jungle (Areas Estimated. Not from Report on Commercial Timber Resources and Primary Roundwood Processing in South Africa: 2001/2002.)				
	Area	Average Mean Annual Increment at Clearfelling Age (Tons/ha/year)	Rotation Applied	Area	Average Mean Annual Increment at Clearfelling Age (Tons/ha/year)	Rotation Applied	Area	Average Mean Annual Increment at Clearfelling Age (Tons/ha/year)	Rotation Applied	Area	Average Mean Annual Increment at Clearfelling Age (Tons/ha/year)	Rotation Applied	Area	Average Mean Annual Increment at Clearfelling Age (Tons/ha/year)	Rotation Applied	Area	Average Mean Annual Increment at Clearfelling Age (Tons/ha/year)	Rotation Applied	
	hectares	tons	years	hectares	tons	years	hectares	tons	years	hectares	tons	years	hectares	tons	years	hectares	tons	years	
Limpopo	-	6.0	10	-	6.0	10	-	6.0	10	-	6.0	10	-	6.0	10	-	-	-	10
Mpumalanga North	-	6.0	10	-	6.0	10	-	6.0	10	-	6.0	10	-	6.0	10	-	-	-	10
Central Districts	-	6.0	10	-	6.0	10	-	6.0	10	-	6.0	10	-	6.0	10	-	-	-	10
Mpumalanga South	17,415	8.1	10	540	8.1	10	-	8.1	10	101	8.1	10	23,100	8.1	10	23,100	3.0	10	
Totals/Wtd. Averages: Central Districts/ Mpumalanga South	17,415	8.1	10	540	8.1	10	-	0.0	10	101	8.1	10	23,100	8.1	10	23,100	3.0	10	
Maputaland	-	N/A	10	-	N/A	10	-	N/A	10	-	N/A	10	-	N/A	10	-	-	-	10
Zululand	4,195	7.4	10	-	7.4	10	136	7.4	10	136	7.4	10	-	7.4	10	-	-	10	
Northern KwaZulu-Natal	33,596	7.7	10	387	7.7	10	339	7.7	10	413	7.7	10	6,000	7.7	10	6,000	3.0	10	
Totals/Wtd. Averages: Moputaland/Zululand/ Northern KwaZulu-Natal	37,791	7.7	10	387	7.7	10	475	7.6	10	413	7.7	10	6,000	7.7	10	6,000	3.0	10	
KwaZulu-Natal Midlands	62,991	8.3	10	159	8.3	10	3,536	8.3	10	78	8.3	10	-	8.3	10	-	-	10	
Southern KwaZulu-Natal	4,107	7.9	10	49	7.9	10	-	7.9	10	7	7.9	10	-	7.9	10	-	-	10	
Eastern Cape	-	5.0	10	-	5.0	10	-	5.0	10	-	5.0	10	-	5.0	10	18,000	3.0	10	
Southern Cape	-	N/A	10	-	N/A	10	-	N/A	10	-	N/A	10	-	N/A	10	-	-	-	10
Western Cape	-	N/A	10	-	N/A	10	-	N/A	10	-	N/A	10	-	N/A	10	-	-	-	10
Total and weighted averages	122,304	8.1		1,135	8.0		4,011	8.2		599	7.8		47,100	7.8		47,100	3.0		
	m <sup>3</sup> /ha/yr:	9.175	(X 1.138)		9.085	(X 1.138)		9.353	(X 1.138)		8.931	(X 1.138)		8.931	(X 1.138)		3.414	(X 1.138)	

SUMMARY: WATTLES:		
Subdivision:	Excl. Jungle	Incl. Jungle
%	73%	100%
Area: (ha)	128,049	175,149
MAI:(t/ha/yr)	8.066	6.703
MAI:(m <sup>3</sup> /ha/yr)	9.179	7.628

**NOTES:**  
 Source(Unless otherwise stated): Report on Commercial Timber Resources and Primary Roundwood Processing in South Africa: 2001/2002.  
 Areas in shaded columns were excluded.  
 N/A: Not Applicable  
 Wattle areas (except jungle areas) were obtained from industry sources and inserted on a pro rata basis based on Commercial Timber Resource areas.  
 The Wattle jungle area of 47,100 hectares is an estimate and was not obtained from the Report on Commercial Timber Resources and Primary Roundwood Processing in South Africa: 2001/2002.  
 Mean annual increment figures for Pine sawlog and Eucalyptus sawlog areas were calculated using the pulpwood conversion ratios as the product to be removed from the yields will be pulpwood and not sawlogs.

REGION	SUMMARY OF AREAS IN HECTARES														Areas Used in Study	
	Totals: Softwood	Totals: E-graminis	Totals: Other Eucalyptus Species	Totals: Wattle	Totals: Hardwood Species	Region Totals	Estimated Wattle Jungle Areas	Region Totals with Wattle Jungle Areas Added	Jungle Areas Softwood	Jungle Areas E-graminis	Jungle Areas Other Eucalyptus Species	Original Jungle Areas Wattle	Areas Excluded Softwood	Areas Excluded Other Hardwood Species		Total of Areas Excluded
Limpopo	27,166	22,537	16,219	-	885	66,807	-	66,807	58	-	-	-	-	885	943	65,864
Mpumalanga North	166,643	59,163	17,613	-	250	243,669	-	243,669	275	78	59	-	-	250	662	243,007
Central Districts	16,077	1,232	2,062	-	16	19,387	-	19,387	-	-	61	-	-	16	77	19,310
Mpumalanga South	142,504	28,805	89,985	18,056	2,484	281,834	23,100	304,934	34	6	70	-	-	2,484	2,594	302,340
Mpumalanga South/Central Districts (Combined)	158,581	30,037	92,047	18,056	2,500	301,221	23,100	324,321	34	6	131	-	-	2,500	2,671	321,650
Maputland	10,267	8,428	625	-	16	19,336	-	19,336	-	-	-	-	-	16	16	19,320
Zululand	22,606	64,624	26,523	4,331	1,552	119,636	-	119,636	-	30	-	-	-	1,552	1,582	118,054
Northern KwaZulu-Natal	17,221	20,931	21,261	34,735	310	94,458	6,000	100,458	27	41	100	-	-	310	478	99,980
Maputland/Zululand/ Northern KwaZulu-Natal (Combined)	50,094	93,983	48,409	39,066	1,878	233,430	6,000	239,430	27	71	100	-	-	1,878	2,076	237,354
KwaZulu-Natal Midlands	64,301	44,330	29,460	66,764	1,055	205,910	-	205,910	50	1	15	-	-	1,055	1,121	204,790
Southern KwaZulu-Natal	50,342	34,138	19,247	4,163	253	108,143	-	108,143	-	20	15	-	-	253	288	107,855
Eastern Cape	108,915	11,659	4,352	-	508	125,434	18,000	143,434	174	100	175	-	-	508	957	142,477
Southern Cape	61,308	19	1,523	-	952	63,802	-	63,802	77	-	-	-	2,381	952	60,392	
Western Cape	17,867	10	386	-	280	18,543	-	18,543	418	-	201	-	1,790	280	15,854	
<b>Total</b>	<b>705,217</b>	<b>295,876</b>	<b>229,256</b>	<b>128,049</b>	<b>8,561</b>	<b>1,366,959</b>	<b>47,100</b>	<b>1,414,059</b>	<b>1,113</b>	<b>276</b>	<b>697</b>	<b>-</b>	<b>4,171</b>	<b>8,561</b>	<b>14,817</b>	<b>1,399,242</b>
Percentages:	49.9%	20.9%	16.2%	9.1%	0.6%	96.7%	3.3%	100.0%	0.1%	0.0%	0.0%	0.0%	0.3%	0.6%	1.0%	99.0%
Percentage of Eucalypts Combined:	38.4%															

**NOTES:**

SOURCE: (unless otherwise stated): Report on Commercial Timber Resources and Primary Roundwood Processing in South Africa 2001/2002.

Areas in shaded columns were excluded.

Wattle areas (except jungle areas) were obtained from industry sources and inserted on a pro rata basis based on Commercial Timber Resource areas.

Wattle jungle areas were estimated and the areas added to the grand total.

REGION	AREA ACCORDING TO THE MAIN PURPOSE FOR WHICH TREES ARE GROWN											
	SAWTIMBER						PULPWOOD					
	Sawlogs: Softwood	Sawlogs: E.grandis	Sawlogs: Other Eucalyptus Species	Sawlogs: Wattle	Sawlogs: Other Hardwood Species	Totals: Sawlogs	Pulpwood: Softwood	Pulpwood: E.grandis	Pulpwood: Other Eucalyptus Species	Pulpwood: Wattle	Pulpwood: Other Hardwood Species	Totals: Pulpwood
Limpopo	26,179	7,722	17	-	109	34,027	952	2,973	10,287	-	4	14,216
Mpumalanga North	135,899	8,269	279	-	5	144,452	30,744	20,868	15,077	-	136	66,825
Central Districts	3,423	-	-	-	-	3,423	12,649	1,232	1,063	-	16	14,960
Mpumalanga South	67,386	114	217	-	2	67,719	75,118	24,772	87,019	17,415	2,020	206,344
Mpumalanga South/Central Districts (Combined)	70,809	114	217	-	2	71,142	87,767	26,004	88,082	17,415	2,036	221,304
Mpumalanga	5,771	-	-	-	-	5,771	4,496	8,421	622	-	-	13,539
Zululand	13,828	480	-	-	-	14,308	8,778	64,139	26,523	4,195	34	103,669
Northern KwaZulu-Natal	10,742	11	-	-	-	10,753	6,479	20,092	20,954	33,596	236	81,357
Mpumalanga/Northern KwaZulu-Natal (Combined)	30,341	491	-	-	-	30,832	19,753	92,652	48,099	37,791	270	198,565
KwaZulu-Natal Midlands	22,000	105	190	-	165	22,460	42,150	43,298	28,976	62,991	733	178,148
Southern KwaZulu-Natal	25,763	75	87	-	117	26,042	24,576	33,271	18,944	4,107	126	81,024
Eastern Cape	95,539	4	70	-	135	95,748	9,853	931	1,469	-	9	12,262
Southern Cape	58,652	-	879	-	513	60,044	3	14	639	-	26	682
Western Cape	15,485	-	28	-	2	15,515	2	-	5	-	107	114
<b>Total</b>	<b>480,667</b>	<b>16,780</b>	<b>1,767</b>	<b>-</b>	<b>1,048</b>	<b>500,262</b>	<b>215,800</b>	<b>220,011</b>	<b>211,578</b>	<b>122,304</b>	<b>3,447</b>	<b>773,140</b>
Percentages:	96.1%	3.4%	0.4%	0.0%	0.2%	100.0%	27.9%	28.5%	27.4%	15.8%	0.4%	100.0%
Percentage of Eucalypts Combined:			3.7%									

**NOTES:**

SOURCE: (unless otherwise stated): Report on Commercial Timber Resources and Primary Roundwood Processing in South Africa 2001/2002.

Areas in shaded columns were excluded.

Wattle areas (except jungle areas) were obtained from industry sources and inserted on a pro rata basis based on Commercial Timber Resource areas. Wattle Jungle areas were estimated and the areas added to the grand total.

REGION	AREA ACCORDING TO THE MAIN PURPOSE FOR WHICH TREES ARE GROWN															
	POLES AND DROPPERS						MINING TIMBER						OTHER PRODUCTS			
	Poles and Droppers: Softwood	Poles and Droppers: Egrandis	Poles and Droppers: Other Eucalyptus Species	Poles and Droppers: Wattle	Poles and Droppers: Other Hardwood Species	Totals: Poles and Droppers	Mining Timber: Softwood	Mining Timber: Egrandis	Mining Timber: Other Eucalyptus Species	Mining Timber: Wattle	Mining Timber: Other Hardwood Species	Totals: Mining Timber	Other Products: Softwood	Other Products: Egrandis	Other Products: Other Eucalyptus Species	Other Products: Wattle
Limpopo	35	3,208	1,938	-	-	5,181	-	7,703	3,491	-	11,195	-	931	486	-	
Mpumalanga North	-	811	306	-	-	1,117	-	29,084	1,830	50	30,964	-	131	121	-	
Central Districts	-	-	-	-	-	-	-	-	999	-	999	5	-	-	-	
Mpumalanga South	-	115	-	-	-	115	-	3,796	1,634	413	6,383	-	8	1,115	101	
Mpumalanga South/Central Districts (Combined)	-	115	-	-	-	115	-	3,796	2,633	413	7,382	5	8	1,115	101	
Maputaland	-	-	-	-	4	4	-	-	-	-	-	-	7	3	-	
Zululand	-	-	-	136	-	136	-	-	-	-	-	-	5	-	-	
Northern KwaZulu-Natal	-	69	240	339	-	648	-	716	67	43	1,213	-	43	-	413	
Maputaland/Zululand/Northern KwaZulu-Natal(Combined)	-	69	240	475	4	788	-	716	67	43	1,213	-	55	3	413	
KwaZulu-Natal Midlands	146	640	5	3,536	-	4,327	-	286	289	57	791	5	1	-	78	
Southern KwaZulu-Natal	-	647	156	-	-	803	-	138	60	8	255	3	7	-	7	
Eastern Cape	3,511	10,387	2,618	-	20	16,536	-	188	30	7	225	12	149	165	-	
Southern Cape	272	-	-	-	-	272	-	5	-	-	5	2,381	-	5	-	
Western Cape	590	5	24	-	165	784	-	-	-	-	-	1,790	5	329	-	
<b>Total</b>	<b>4,554</b>	<b>15,882</b>	<b>5,287</b>	<b>4,011</b>	<b>189</b>	<b>29,923</b>	-	<b>41,916</b>	<b>8,400</b>	<b>1,135</b>	<b>52,030</b>	<b>4,196</b>	<b>1,287</b>	<b>2,224</b>	<b>599</b>	
Percentages:	15.2%	53.1%	17.7%	13.4%	0.6%	100.0%	0.0%	80.6%	16.1%	2.2%	100.0%	36.2%	11.1%	19.2%	5.2%	
Percentage of Eucalypts Combined:	70.7%															

**NOTES:**

SOURCE: (unless otherwise stated): Report on Commercial Timber Resources and Primary Roundwood Processing in South Africa 2001/2002.

Areas in shaded columns were excluded.

Wattle areas (except jungle areas) were obtained from industry sources and inserted on a pro rata basis based on Commercial Timber Resource areas.

Wattle Jungle areas were estimated and the areas added to the grand total.

AREAS DAMAGED AS A RESULT OF FIRE AND SEVERE WEATHER CONDITIONS: SOFTWOOD: 1991 - 2002																				
YEAR	Limpopo		Mpumalanga North		Mpumalanga South Central Districts (Combined)		Mpumalanga Zululand Northern KwaZulu-Natal (Combined)		KwaZulu-Natal Midlands		Southern KwaZulu-Natal		Eastern Cape		Southern Cape		Western Cape		All Areas	
	Area Damaged by Fire (ha)	Area damaged as a result of Severe Weather Conditions (ha)	Area Damaged by Fire (ha)	Area damaged as a result of Severe Weather Conditions (ha)	Area Damaged by Fire (ha)	Area damaged as a result of Severe Weather Conditions (ha)	Area Damaged by Fire (ha)	Area damaged as a result of Severe Weather Conditions (ha)	Area Damaged by Fire (ha)	Area damaged as a result of Severe Weather Conditions (ha)	Area Damaged by Fire (ha)	Area damaged as a result of Severe Weather Conditions (ha)	Area Damaged by Fire (ha)	Area damaged as a result of Severe Weather Conditions (ha)	Area Damaged by Fire (ha)	Area damaged as a result of Severe Weather Conditions (ha)	Area Damaged by Fire (ha)	Area damaged as a result of Severe Weather Conditions (ha)	Area Damaged by Fire (ha)	Area damaged as a result of Severe Weather Conditions (ha)
1991/92	279	237	780	3,413	1,041	476	694	402	1,571	282	405	310	234	210	480	33	200	3	5,684	5,366
1992/93	72	1,397	728	1,177	882	786	3,768	1,384	785	1,084	295	817	687	25	292	122	81	52	7,590	6,844
1993/94	33	361	888	244	766	529	2,545	1,066	497	925	2,915	352	6,404	111	27	19	49	48	14,124	3,655
1994/95	1,968	278	5,784	-	1,418	504	2,829	1,051	558	600	3,241	282	3,600	106	500	19	208	49	20,106	2,889
1995/96	50	218	271	14	520	420	1,791	743	727	452	1,987	310	914	63	588	135	196	-	7,044	2,355
1996/97	25	2	322	19	402	1,179	1,431	542	552	500	999	344	818	40	3,423	19	99	-	8,071	2,645
1997/98	154	35	395	8	564	110	2,141	701	157	8	459	33	685	-	327	-	227	24	5,109	919
1998/99	49	-	731	34	686	466	1,245	324	206	127	419	236	960	174	4,126	-	2,579	25	11,001	1,386
1999/00	221	-	101	55	511	15	1,175	-	557	4	592	196	3,598	-	2,177	-	1,717	-	10,649	270
2000/01	27	-	343	163	4,532	7	1,475	-	469	3	397	8	3,018	-	313	-	1,645	-	12,219	181
2001/02	2	-	578	179	2,457	471	1,288	-	428	19	344	1	5,919	4	116	-	728	6	11,860	680
<b>Average per Year</b>	<b>262</b>	<b>230</b>	<b>993</b>	<b>482</b>	<b>1,253</b>	<b>451</b>	<b>1,853</b>	<b>565</b>	<b>592</b>	<b>364</b>	<b>1,096</b>	<b>263</b>	<b>2,440</b>	<b>67</b>	<b>1,124</b>	<b>32</b>	<b>703</b>	<b>19</b>	<b>10,314</b>	<b>2,472</b>
<b>Total Area of Region</b>	<b>27,166</b>	<b>27,166</b>	<b>166,643</b>	<b>166,643</b>	<b>158,581</b>	<b>158,581</b>	<b>50,095</b>	<b>64,301</b>	<b>64,301</b>	<b>64,301</b>	<b>50,342</b>	<b>50,342</b>	<b>108,914</b>	<b>108,914</b>	<b>61,307</b>	<b>61,307</b>	<b>17,868</b>	<b>17,868</b>	<b>705,217</b>	<b>705,217</b>
%	1.0%	0.8%	0.6%	0.3%	0.8%	0.3%	3.7%	1.1%	0.9%	0.6%	2.2%	0.5%	2.2%	0.1%	1.8%	0.1%	3.9%	0.1%	1.5%	0.4%
Combined Averages:	1.8%		0.9%		1.1%		4.8%		1.5%		2.7%		2.3%		1.9%		4.0%		1.8%	

SOURCE: Report on Commercial Timber Resources and Primary Roundwood Processing in South Africa: 1991/1992 - 2001/2002. Overall estimates (Hardwood and Softwood) for 2002/2003 are 35,000 ha.

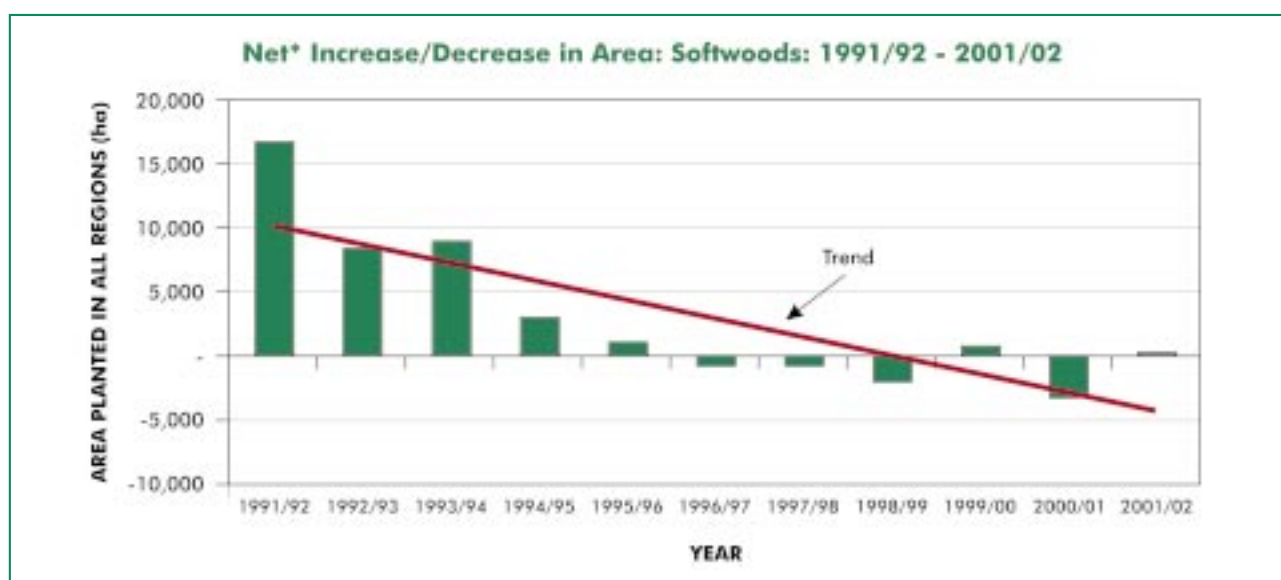
AREAS DAMAGED AS A RESULT OF FIRE AND SEVERE WEATHER CONDITIONS: HARDWOOD: 1991 - 2002																				
YEAR	Limpopo		Mpumalanga North		Mpumalanga South Central Districts (Combined)		Mpumalanga Zululand Northern KwaZulu-Natal (Combined)		KwaZulu-Natal Midlands		Southern KwaZulu-Natal		Eastern Cape		Southern Cape		Western Cape		All Areas	
	Area Damaged by Fire (ha)	Area damaged as a result of Severe Weather Conditions (ha)	Area Damaged by Fire (ha)	Area damaged as a result of Severe Weather Conditions (ha)	Area Damaged by Fire (ha)	Area damaged as a result of Severe Weather Conditions (ha)	Area Damaged by Fire (ha)	Area damaged as a result of Severe Weather Conditions (ha)	Area Damaged by Fire (ha)	Area damaged as a result of Severe Weather Conditions (ha)	Area Damaged by Fire (ha)	Area damaged as a result of Severe Weather Conditions (ha)	Area Damaged by Fire (ha)	Area damaged as a result of Severe Weather Conditions (ha)	Area Damaged by Fire (ha)	Area damaged as a result of Severe Weather Conditions (ha)	Area Damaged by Fire (ha)	Area damaged as a result of Severe Weather Conditions (ha)	Area Damaged by Fire (ha)	Area damaged as a result of Severe Weather Conditions (ha)
1991/92	239	1,604	1,474	2,937	632	918	2,148	874	880	668	398	687	-	-	12	-	2	-	5,785	7,688
1992/93	26	5,204	825	603	797	1,557	3,084	1,786	1,388	3,143	148	1,342	62	-	3	-	1	-	6,334	13,635
1993/94	307	1,123	1,675	409	640	1,351	2,014	516	894	787	259	868	1	1	1	-	-	-	5,791	5,055
1994/95	131	838	1,761	415	1,363	1,029	1,906	405	680	1,721	158	193	19	1	13	-	-	-	6,031	4,602
1995/96	219	115	421	18	1,145	487	1,771	299	777	1,175	196	55	160	-	-	-	-	-	4,689	2,149
1996/97	44	74	468	18	936	708	639	269	3,477	911	117	25	149	-	-	-	-	-	5,830	2,005
1997/98	36	109	97	5	645	122	1,765	151	227	34	98	-	123	-	1	-	175	-	3,167	421
1998/99	146	207	344	24	419	305	2,965	197	1,034	900	325	20	200	-	21	-	-	-	5,454	1,653
1999/00	57	-	6,908	125	214	13	1,014	64	739	110	511	15	74	1	45	10	10	-	9,572	338
2000/01	74	30	227	-	1,209	113	1,819	69	682	27	370	104	459	5	1	-	206	3	5,047	351
2001/02	421	10	330	-	510	388	2,387	96	318	54	298	2	379	-	224	-	-	-	4,867	550
<b>Average per Year</b>	<b>155</b>	<b>847</b>	<b>1,321</b>	<b>414</b>	<b>774</b>	<b>636</b>	<b>1,956</b>	<b>430</b>	<b>1,009</b>	<b>866</b>	<b>262</b>	<b>301</b>	<b>148</b>	<b>1</b>	<b>29</b>	<b>1</b>	<b>36</b>	<b>0</b>	<b>5,688</b>	<b>3,495</b>
<b>Total Area of Region</b>	<b>39,673</b>	<b>39,673</b>	<b>77,078</b>	<b>77,078</b>	<b>143,553</b>	<b>143,553</b>	<b>176,326</b>	<b>176,326</b>	<b>123,421</b>	<b>123,421</b>	<b>64,949</b>	<b>64,949</b>	<b>18,017</b>	<b>18,017</b>	<b>2,494</b>	<b>2,494</b>	<b>675</b>	<b>675</b>	<b>646,186</b>	<b>646,186</b>
%	0.4%	2.1%	1.7%	0.5%	0.5%	0.4%	1.1%	0.2%	0.8%	0.7%	0.4%	0.5%	0.8%	0.0%	1.2%	0.0%	5.3%	0.0%	0.9%	0.5%
Combined Averages:	2.5%		2.3%		1.0%		1.4%		1.5%		0.9%		0.8%		1.2%		5.3%		1.4%	

SOURCE: Report on Commercial Timber Resources and Primary Roundwood Processing in South Africa: 1991/1992 - 2001/2002. Overall estimates (Hardwood and Softwood) for 2002/2003 are 35,000 ha.

NET INCREASE/DECREASE IN AREA: SOFTWOODS: 1991 - 2001	
YEAR	Net increase/decrease in Area: Softwoods
1991/92	16,331
1992/93	8,310
1993/94	8,722
1994/95	3,145
1995/96	717
1996/97	-510
1997/98	-523
1998/99	-1,443
1999/00	475
2000/01	-3,142
2001/02	208
<b>10 yr. Av.: 1992 - 2001</b>	<b>1,596</b>
<b>5 yr. Av.: 1997 - 2001</b>	<b>-885</b>

SOURCE: Report on Commercial Timber Resources and Primary Roundwood Processing in South Africa: 1991/1992 - 2001/2002.

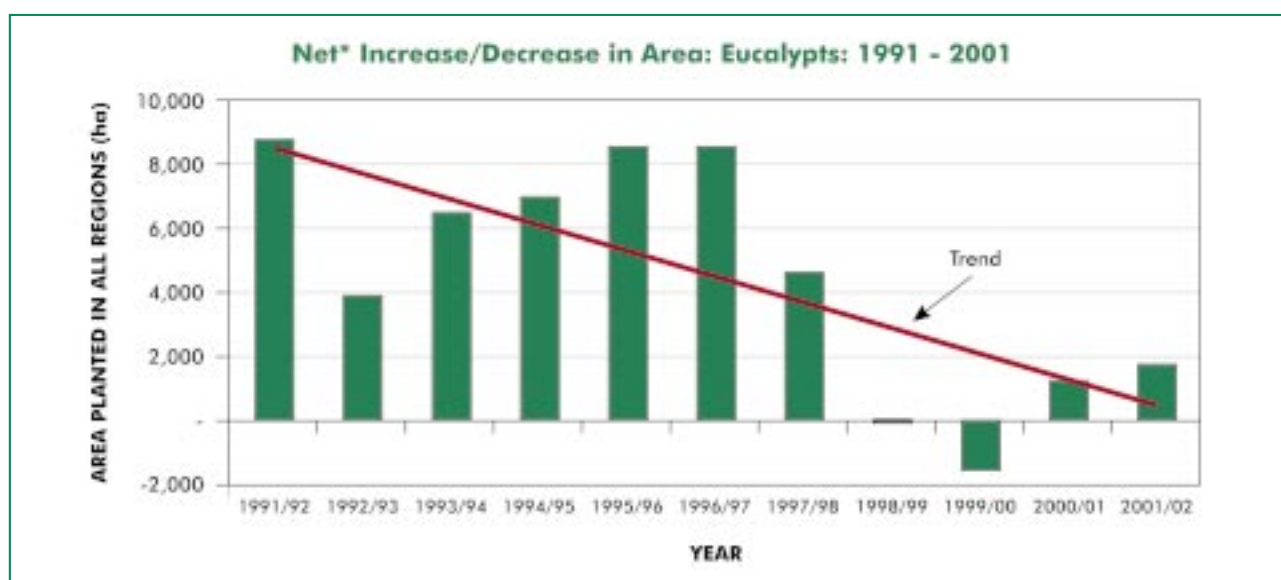
\* The net increase is the area afforested in a given year less the area converted therefrom to another Genus or to non-forestry activities.



NET INCREASE/DECREASE IN AREA: EUCALYPTS: 1991 - 2001	
YEAR	Net increase/decrease in Area: Eucalypts
1991/92	8,666
1992/93	3,898
1993/94	6,488
1994/95	7,016
1995/96	8,442
1996/97	8,403
1997/98	4,562
1998/99	-32
1999/00	-1,463
2000/01	1,228
2001/02	1,695
<b>10 yr. Av.: 1992 - 2001</b>	<b>4,024</b>
<b>5 yr. Av.: 1997 - 2001</b>	<b>1,198</b>

SOURCE: Report on Commercial Timber Resources and Primary Roundwood Processing in South Africa: 1991/1992 - 2001/2002.

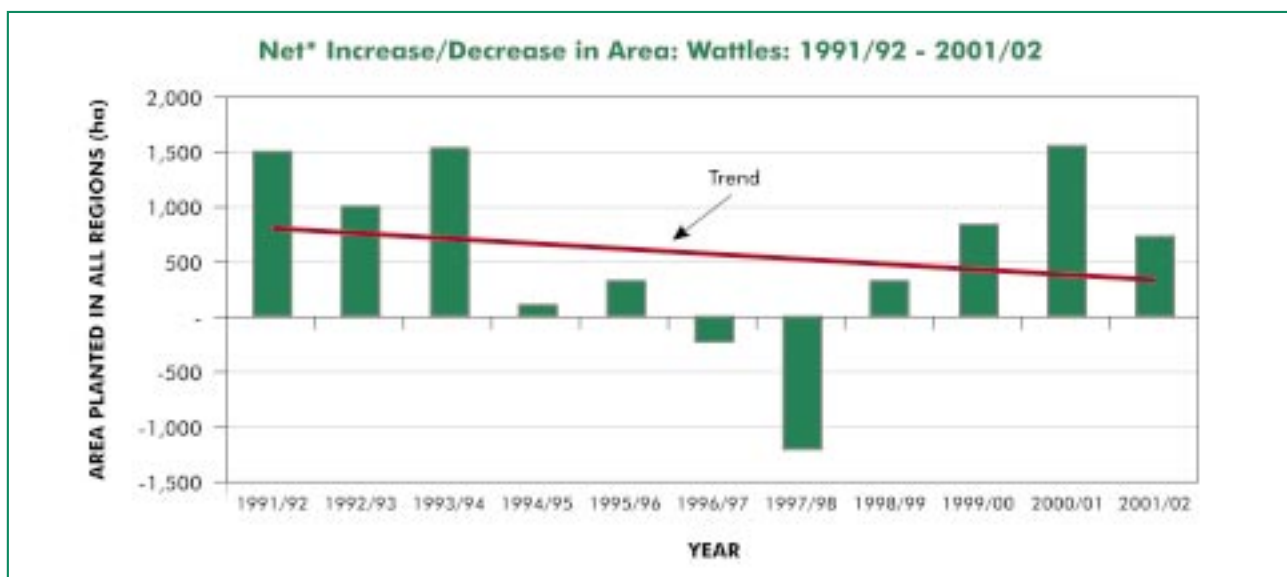
\* The net increase is the area afforested in a given year less the area converted therefrom to another Genus or to non-forestry activities.



NET INCREASE/DECREASE IN AREA: WATTLES: 1991 - 2001	
YEAR	Net increase/decrease in Area: Wattles
1991/92	1,498
1992/93	1,003
1993/94	1,533
1994/95	95
1995/96	295
1996/97	-206
1997/98	-1,193
1998/99	325
1999/00	850
2000/01	1,557
2001/02	754
<b>10 yr. Av.: 1992 - 2001</b>	<b>501</b>
<b>5 yr. Av.: 1997 - 2001</b>	<b>459</b>

SOURCE: Report on Commercial Timber Resources and Primary Roundwood Processing in South Africa: 1991/1992 - 2001/2002.

\* The net increase is the area afforested in a given year less the area converted therefrom to another Genus or to non-forestry activities.



ANALYSIS OF WATTLE JUNGLE AREAS								
REGION	FIRST ROTATION (10 Yrs)				FOLLOWING TWO ROTATIONS (20 yrs)			
	Period (years)	Area (hectares)	MAI (tons per hectare per year)	Yield per Annum (Tons)	Period (years)	Area (hectares)	MAI (tons per hectare per year)	Yield per Annum (Tons)
Mpumalanga South	10	23,100	3.0	69,300	20	12,800	5.0	64,000
Northern KwaZulu-Natal	10	6,000	3.0	18,000	20	3,300	5.0	16,500
Eastern Cape	10	18,000	3.0	54,000	20	10,000	5.0	50,000
TOTALS: (Area/Yield)		47,100		141,300		26,100		130,500

**NOTE:** Areas and MAI's were estimated.

HISTORY OF ANNUAL PURCHASES OF PULPWOOD AND RELATED PRODUCTS IN TONS: 1991/02 - 2001/02																				
YEAR	Softwood Pulp (1.0)	Eucalyptus grandis Pulp (1.47)	Other Eucalyptus Species Pulp (1.25)	Wattle Pulp (1.19)	Other Hardwood Species Pulp (1.25)	Poles: Softwood (1.0)	Poles: Egrandis (1.47)	Poles: Other Eucalyptus Species (1.25)	Poles: Wattle (1.19) since 2000/2001	Poles: Other Hardwood Species (1.25)	Mining Timber: Egrandis (1.47)	Mining Timber: Other Eucalyptus Species (1.25)	Mining Timber: Wattle (1.19) since 2000/2001	Mining Timber: Other Hardwood Species (1.25)	Charcoal: Softwood (1.0)	Charcoal: Egrandis (1.47)	Charcoal: Other Eucalyptus Species (1.25)	Charcoal: Wattle (1.19) since 2000/2001	Charcoal: Other Hardwood Species (1.25)	TOTAL
1991/92	3,472,695	1,774,284	1,135,313	1,027,251	43,760	144,165	76,815	13,523	-	-	1,271,166	188,931	81,637	-	-	-	22,000	229,106	-	9,480,646
1992/93	3,464,575	2,230,877	710,551	615,677	25,696	146,369	69,548	10,822	-	-	971,759	90,967	54,079	-	-	-	4,425	134,387	-	8,529,732
1993/94	3,099,521	3,658,468	503,006	725,517	21,627	93,375	78,187	13,298	5,042	-	824,706	299,038	71,345	-	1,000	-	13,242	55,867	-	9,463,239
1994/95	3,212,017	3,401,071	687,314	591,280	1,217	94,811	77,365	20,254	5,042	-	695,415	294,159	27,515	-	1,000	-	7,500	107,349	16,073	9,239,383
1995/96	3,216,517	3,702,966	760,254	681,427	769	107,240	89,099	13,675	3,782	-	504,622	184,330	5,970	-	1,000	-	7,500	78,033	34,980	9,392,164
1996/97	3,005,678	3,691,383	773,176	625,632	1,620	116,149	90,883	12,970	1,824	-	433,240	190,857	7,480	-	1,113	-	7,485	97,976	-	9,057,466
1997/98	3,420,617	3,847,136	2,024,000	1,595,277	1,292	104,633	40,630	17,035	3,782	-	455,094	184,280	-	-	-	11,800	-	265,690	-	11,971,266
1998/99	3,309,704	3,560,676	1,684,643	1,334,288	1,424	114,957	28,154	17,602	-	-	217,783	302,270	-	-	-	-	-	250,172	-	10,821,673
1999/00	2,942,097	3,731,257	1,583,102	1,033,920	644,614	107,595	103,346	16,838	-	2,927	375,801	164,499	-	-	-	-	21,659	186,878	-	10,914,533
2000/01	3,313,255	3,693,987	1,446,976	759,800	-	101,801	147,976	1,032	-	-	514,110	34,328	-	-	-	-	25,630	201,436	-	10,240,331
2001/02	3,178,348	3,382,408	2,122,239	1,303,405	-	112,079	132,018	44,118	-	-	383,914	-	-	455	-	-	25,630	157,657	-	10,883,550
Average per Year:	3,239,548	3,334,047	1,220,961	935,770	67,456	113,016	84,911	16,470	1,770	266	604,328	175,787	22,548	41	374	5,733	11,372	160,414	4,641	9,999,453

\* Figures in brackets are conversion ratios - m<sup>3</sup> to tons.

SOURCE: Report on Commercial Timber Resources and Primary Roundwood Processing in South Africa: 1991/1992 - 2001/2002.

This information was extracted from the Annual Reports on Commercial Timber Resources but the volumes reported are too low compared to the independently gathered information and has therefore not been used. Data included in the table on the right is for information only. It is given in tons as all yields in this study are quoted in tons.

HISTORY OF ANNUAL PURCHASES: SAWTIMBER AND VENEER PRODUCTS IN TONS 1991/02 - 2001/02			
YEAR	Softwood Sawtimber and Veneer (tons) (1:0.94)	Egrandis and Other Eucalyptus Species Sawtimber and Veneer (tons) (1:0.94, 1:0.78)	Other Hardwood Species Sawtimber and Veneer (tons) (1:0.78)
1991/92	3,569,602	704,810	15,990
1992/93	3,489,231	311,275	10,246
1993/94	2,994,126	329,170	12,237
1994/95	3,286,973	326,030	11,965
1995/96	3,063,511	299,249	10,563
1996/97	3,186,062	319,785	11,819
1997/98	3,111,211	233,789	15,956
1998/99	3,260,327	284,731	10,214
1999/00	3,277,377	256,431	6,951
2000/01	3,364,052	254,245	10,288
2001/02	3,665,490	230,658	17,762
Average per Year:	3,297,087	322,743	12,181
			TOTAL (tons)
			4,290,402
			3,810,752
			3,335,532
			3,624,969
			3,373,322
			3,517,666
			3,360,956
			3,555,272
			3,540,759
			3,628,585
			3,913,910
			3,632,012

ESTIMATE OF CHIP SOURCE										
Sawmill	Chip Volume Recovered Per Annum (m <sup>3</sup> )	Piet Retief	Mandini	Sonae	PG Bison PMB	Magnaboard	George	Stellenbosch	Ngodwana	Silicon Smelters
Bracken Timbers	11,770		11,770							
Cape Sawmills	25,032							25,032		
Densa	9,264								9,264	
e'Mpuluzi	17,318			17,318						
Graskop	18,000	18,000								
Great Brak	5,356						5,356			
KLF Blyde	7,663								7,663	
KLF Timbadola	5,140									5,140
Kusel	7,692		7,692							
Langeni	41,024					41,024				
Lomati	50,000								50,000	
Madiba Mills	2,074								2,074	
Malenge	43,521		43,521							
Mogoboya	-									
MTO George	23,181						23,181			
Newington Timber Co.	7,362	7,362								
Nicholson & Mullin	12,702								12,702	
Pine Valley	5,083								5,083	
R F Gevers	9,548	9,548								
Rance Timber	6,444					6,444				
Seven Oaks	5,647				5,647					
Singisi	26,820		26,820							
Stevens Lumber Mill	22,255									22,255
Swaziland	-									
TTC Sabie	23,249								23,249	
Weza	12,519		12,519							
White River	6,834								6,834	
York Lumber	4,789								4,789	
Yorkcor Golden Rhino	9,779	9,779								
Yorkcor Roburnia	6,784	6,784								
<b>TOTAL</b>	<b>426,851</b>	<b>51,473</b>	<b>102,321</b>	<b>17,318</b>	<b>5,647</b>	<b>47,468</b>	<b>28,538</b>	<b>25,032</b>	<b>121,658</b>	<b>27,395</b>

TABLE 24A: CONTRIBUTION OF FORESTRY & FOREST PRODUCTS INDUSTRY TO G.D.P. (Expressed In Real terms)													
C.P.I	8.4	9.6	11.1	12.6	14.0	16.0	18.8	22.2	25.3	28.7	33.0	37.7	43.7
	YEAR												
EXPRESSED IN 2002/03 VALUES													
	1979/80	1980/81	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92
RAND MILLION													
Total R.S.A. G.D.P.	609548	638844	633225	642270	663907	670856	643910	639009	651988	686481	695982	692151	597119
Agriculture, Forestry & Fisheries G.D.P.	44036	41323	46108	35683	33250	39375	36638	39414	41680	40829	41261	34440	29712
Manufacturing G.D.P.	132476	145656	154856	153119	162643	153113	148676	149694	158455	173240	176421	174493	150535
Forestry G.D.P.	1,960.7	2,252.2	2,028.8	2,259.4	2,204.3	2,263.1	2,375.5	2,605.1	2,672.7	2,901.4	2,723.3	2,419.3	2,452.0
Forest Products G.D.P.	8,299.9	9,897.1	8,906.3	9,155.6	8,992.8	10,426.3	10,954.3	12,998.3	13,293.5	16,284.3	16,148.8	14,409.7	12,948.7
Forestry as % to Agricultural G.D.P.	4.5%	5.5%	4.4%	6.3%	6.6%	5.7%	6.5%	6.6%	6.4%	7.1%	6.6%	7.0%	8.3%
Forest Products as % to Manufacturing G.D.P.	6.3%	6.8%	5.8%	6.0%	5.5%	6.8%	7.4%	8.7%	8.4%	9.4%	9.2%	8.3%	8.6%
Forest Products as % to Total G.D.P.	1.4%	1.5%	1.4%	1.4%	1.4%	1.6%	1.7%	2.0%	2.0%	2.4%	2.3%	2.1%	2.2%

TABLE 24B: CONTRIBUTION OF FORESTRY & FOREST PRODUCTS INDUSTRY TO G.D.P. (Expressed in real terms)														
C.P.I	48.5	52.8	58.1	62.0	67.5	71.9	77.8	80.3	85.8	90.6	100.0	Change on prev. year		Growth per annum
	YEAR													
EXPRESSED IN 2002/03 VALUES														
	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03			
RAND MILLION														
Total R.S.A. G.D.P.	878623	913104	943372	996705	1015895	1027715	1029267	1106420	1146210	1237192	1209499	-2.2%	3.0%	
Agriculture, Forestry & Fisheries G.D.P.	33575	38356	33248	38260	37244	33779	32129	32453	36284	46466	41935	-9.8%	-0.2%	
Manufacturing G.D.P.	170396	174371	182754	184073	184599	179439	174828	187046	193859	218647	208267	-4.7%	2.0%	
Forestry G.D.P.	2,101.1	2,014.0	2,771.1	2,899.8	2,586.6	2,959.4	2,915.6	3,205.6	3,161.2	3,605.1	4,079.9	13.2%	3.2%	
Forest Products G.D.P.	10,495.9	11,841.5	12,872.3	14,513.3	13,544.7	14,033.5	15,184.2	16,012.1	13,830.4	15,239.4	14,590.7	-4.3%	2.5%	
Forestry as % to Agricultural G.D.P.	6.3%	5.3%	8.3%	7.6%	6.9%	8.8%	9.1%	9.9%	8.7%	7.8%	9.7%	25.4%	3.5%	
Forest Products as % to Manufacturing G.D.P.	6.2%	6.8%	7.0%	7.9%	7.3%	7.8%	8.7%	8.6%	7.1%	7.0%	7.0%	0.5%	0.5%	
Forest Products as % to Total G.D.P.	1.2%	1.3%	1.4%	1.5%	1.3%	1.4%	1.5%	1.4%	1.2%	1.2%	1.2%	-2.1%	-0.5%	

SOURCE: FORESTRY SOUTH AFRICA

FORECAST OF ROUNDWOOD OTHER THAN SAWLOGS IN TONS: ALL REGIONS: 2005 - 2034: INCLUDING ADJUSTMENTS										
YEAR	TONS							% Reduction for Fires and Other Factors: Softwood	% Reduction for Fires and Other Factors: Hardwoods	TONS Total Forecast (Rounded to 100)
	Pine (1.00)	E. grandis (1.37)	Other Eucalypts (1.16)	Wattle (1.138)	Wattle Jungle (1.138)	Wattle Total	Total Hardwoods			
2005-06	3,868,452	5,966,143	5,653,351	1,173,908	141,300	1,315,208	12,934,701	2.6%	1.9%	16,453,400
2006-07	4,354,663	5,827,040	5,365,649	1,201,538	141,300	1,342,838	12,535,527	2.6%	1.9%	16,535,200
2007-08	4,814,353	5,750,802	4,838,539	1,329,756	141,300	1,471,056	12,060,397	2.6%	1.9%	16,516,800
2008-09	5,185,708	5,846,566	5,020,344	1,245,110	141,300	1,386,410	12,253,321	2.6%	1.9%	17,067,600
2009-10	5,799,928	5,145,868	4,142,435	1,031,285	141,300	1,172,585	10,460,887	2.6%	1.9%	15,907,500
Annual Average: 2005-2009	<b>4,804,621</b>	<b>5,707,284</b>	<b>5,004,063</b>	<b>1,196,319</b>	<b>141,300</b>	<b>1,337,619</b>	<b>12,048,967</b>	<b>2.6%</b>	<b>1.9%</b>	<b>16,496,100</b>
2010-11	6,075,117	5,128,704	4,137,650	1,020,253	141,300	1,161,553	10,427,906	2.6%	1.9%	16,143,100
2011-12	4,305,349	5,117,793	4,140,054	906,894	141,300	1,048,194	10,306,042	2.6%	1.9%	14,300,500
2012-13	4,190,824	5,110,753	4,138,362	910,117	141,300	1,051,417	10,300,533	2.6%	1.9%	14,183,500
2013-14	4,293,201	5,123,146	4,151,634	857,719	141,300	999,019	10,273,799	2.6%	1.9%	14,257,000
2014-15	3,318,227	6,693,996	6,661,518	619,191	141,300	760,491	14,116,005	2.6%	1.9%	17,076,300
Annual Average: 2010-2014	<b>4,436,544</b>	<b>5,434,878</b>	<b>4,645,844</b>	<b>862,835</b>	<b>141,300</b>	<b>1,004,135</b>	<b>11,084,857</b>	<b>2.6%</b>	<b>1.9%</b>	<b>15,192,100</b>
2015-16	3,538,693	4,859,834	4,720,103	1,303,907	138,330	1,442,237	11,022,173	2.6%	1.9%	14,256,400
2016-17	3,143,487	4,776,497	4,189,695	1,118,326	138,330	1,256,656	10,222,848	2.6%	1.9%	13,087,600
2017-18	3,192,772	4,912,258	4,392,831	1,246,543	138,330	1,384,873	10,689,961	2.6%	1.9%	13,593,800
2018-19	3,201,200	4,217,772	3,490,074	1,161,898	138,330	1,300,228	9,008,073	2.6%	1.9%	11,952,300
2019-20	3,286,466	4,223,610	3,492,133	948,072	138,330	1,086,402	8,802,145	2.6%	1.9%	11,833,300
Annual Average: 2015-2019	<b>3,272,524</b>	<b>4,597,994</b>	<b>4,056,967</b>	<b>1,155,749</b>	<b>138,330</b>	<b>1,294,079</b>	<b>9,949,040</b>	<b>2.6%</b>	<b>1.9%</b>	<b>12,944,700</b>
2020-21	3,384,565	4,239,717	3,491,043	959,452	138,330	1,097,782	8,828,541	2.6%	1.9%	11,954,700
2021-22	3,109,509	4,575,809	3,793,188	846,094	138,330	984,424	9,353,420	2.6%	1.9%	12,201,800
2022-23	3,177,454	4,580,937	3,792,532	849,316	138,330	987,646	9,361,115	2.6%	1.9%	12,275,500
2023-24	3,326,856	6,547,934	6,507,396	796,918	138,330	935,248	13,990,579	2.6%	1.9%	16,961,700
2024-25	3,788,935	4,764,333	4,565,974	619,191	138,330	757,521	10,087,828	2.6%	1.9%	13,583,600
Annual Average: 2020-2024	<b>3,357,464</b>	<b>4,941,746</b>	<b>4,430,026</b>	<b>814,194</b>	<b>138,330</b>	<b>952,524</b>	<b>10,324,297</b>	<b>2.6%</b>	<b>1.9%</b>	<b>13,395,500</b>
2025-26	4,320,470	4,672,480	4,036,451	1,273,507	138,330	1,411,837	10,120,769	2.6%	1.9%	14,133,500
2026-27	4,698,638	4,817,899	4,218,520	1,087,925	138,330	1,226,255	10,262,674	2.6%	1.9%	14,640,800
2027-28	5,219,264	4,081,772	3,338,980	1,216,143	138,330	1,354,473	8,775,225	2.6%	1.9%	13,688,800
2028-29	5,108,975	4,080,113	3,339,016	1,131,497	138,330	1,269,827	8,688,956	2.6%	1.9%	13,496,800
2029-30	4,001,033	4,082,178	3,340,063	917,672	138,330	1,056,002	8,478,242	2.6%	1.9%	12,211,400
Annual Average: 2025-2029	<b>4,669,676</b>	<b>4,346,889</b>	<b>3,654,606</b>	<b>1,125,349</b>	<b>138,330</b>	<b>1,263,679</b>	<b>9,265,173</b>	<b>2.6%</b>	<b>1.9%</b>	<b>13,634,300</b>
2030-31	4,232,615	4,592,308	3,831,497	929,052	138,330	1,067,382	9,491,186	2.6%	1.9%	13,430,400
2031-32	4,150,158	4,586,779	3,792,911	815,693	138,330	954,023	9,333,713	2.6%	1.9%	13,195,700
2032-33	3,193,807	6,576,463	6,509,257	818,916	138,330	957,246	14,042,965	2.6%	1.9%	16,883,500
2033-34	3,142,500	4,743,436	4,568,393	766,518	138,330	904,848	10,216,677	2.6%	1.9%	13,080,600
2034-35	3,087,700	4,651,487	4,041,082	619,191	138,330	757,521	9,450,090	2.6%	1.9%	12,275,300
Annual Average: 2030-2034	<b>3,561,356</b>	<b>5,030,094</b>	<b>4,548,628</b>	<b>789,874</b>	<b>138,330</b>	<b>928,204</b>	<b>10,506,926</b>	<b>2.6%</b>	<b>1.9%</b>	<b>13,773,100</b>
<b>Annual Average: 2005-2034</b>	<b>4,017,031</b>	<b>5,009,814</b>	<b>4,390,022</b>	<b>990,720</b>	<b>139,320</b>	<b>1,130,040</b>	<b>10,529,877</b>	<b>2.6%</b>	<b>1.9%</b>	<b>14,239,300</b>

Logs included are those of pulpwood dimensions only from each timber type and therefore includes by-products from the sawlog production operations.

30% of Class a logs from Pine sawtimber compartments (thinnings and clearfellings) were assumed to be pulpwood.

Wattle regions were based on Extract Factory or Collection Depot location.

Wattle Jungle forecasts are based on: Mpumalanga South: 23,100 ha @ 3 tons/ha/annum, Northern KZNatal: 6,000 ha @ 3 tons/ha/annum and Eastern Cape: 18,000 ha @ 3 tons/ha/annum for one rotation and 10,000 ha @ 5 tons/ha/annum thereafter.

Mpumalanga South/Central Districts (Combined) includes both Regions' data, Zululand (Combined) includes Maputaland, Zululand and Northern KwaZulu-Natal Regions.

Some smoothing was applied to Pine and Eucalypt clearfelling areas in order to even out yields realistically.

Allowance of 6% Pine and Eucalypt increase in MAI.

Increase in fire damage.

Reduction from 5% to 2.5% of area to be removed for environmental reasons (DWAf).

YEAR	CURRENT SUPPLY AND DEMAND LEVELS ADJUSTED BY PUBLISHED/KNOWN INCREASES ONLY Analysis of Supply and Demand for Roundwood other than Sawlogs in '000 Tons: 2005 - 2034										OVERSUPPLY (+) / UNDERSUPPLY (-)					% SHORTAGE
	SUPPLY					DEMAND										
	Pine	Eucalypt	Wattle	Total		Pine	Eucalypt	Wattle	Total		Pine	Eucalypt	Wattle	Total	Cumulative	
2005	3,684	10,808	1,231	15,724	3,292	12,298	1,648	17,238	392	-1,490	-417	-1,514	-1,514	8.78		
2006	4,147	10,411	1,257	15,816	3,292	12,248	1,648	17,188	855	-1,837	-391	-1,372	-2,886	7.98		
2007	4,585	9,850	1,376	15,812	3,262	12,048	1,648	16,958	1,323	-2,198	-272	-1,146	-4,033	6.76		
2008	4,939	10,108	1,298	16,345	3,242	12,428	1,648	17,318	1,697	-2,320	-350	-973	-5,006	5.62		
2009	5,524	8,640	1,099	15,262	3,242	12,340	1,623	17,205	2,282	-3,700	-524	-1,943	-6,948	11.29		
<b>5yr Avg 2005-2009</b>	<b>4,576</b>	<b>9,964</b>	<b>1,252</b>	<b>15,792</b>	<b>3,266</b>	<b>12,272</b>	<b>1,643</b>	<b>17,181</b>	<b>1,310</b>	<b>-2,309</b>	<b>-391</b>	<b>-1,390</b>	<b>-4,077</b>	<b>8.09</b>		
2010	5,786	8,619	1,088	15,494	3,242	12,340	1,623	17,205	2,544	-3,721	-535	-1,711	-8,659	9.95		
2011	4,101	8,612	983	13,695	3,242	12,340	1,623	17,205	859	-3,728	-640	-3,510	-12,169	20.40		
2012	3,991	8,603	986	13,581	3,242	12,340	1,623	17,205	749	-3,737	-637	-3,624	-15,794	21.06		
2013	4,089	8,627	937	13,653	3,242	12,340	1,623	17,205	847	-3,713	-686	-3,552	-19,345	20.64		
2014	3,160	12,423	715	16,299	3,242	12,340	1,623	17,205	-82	83	-908	-906	-20,251	5.27		
<b>5yr Avg 2010-2014</b>	<b>4,225</b>	<b>9,377</b>	<b>942</b>	<b>14,544</b>	<b>3,242</b>	<b>12,340</b>	<b>1,623</b>	<b>17,205</b>	<b>983</b>	<b>-2,963</b>	<b>-681</b>	<b>-2,661</b>	<b>-15,244</b>	<b>15.46</b>		
2015	3,370	8,911	1,342	13,623	3,242	12,340	1,623	17,205	128	-3,429	-281	-3,582	-23,833	20.82		
2016	2,994	8,340	1,169	12,503	3,242	12,340	1,623	17,205	-248	-4,000	-454	-4,702	-28,535	27.33		
2017	3,041	8,655	1,288	12,985	3,242	12,340	1,623	17,205	-201	-3,685	-335	-4,220	-32,756	24.53		
2018	3,049	7,170	1,209	11,428	3,242	12,340	1,623	17,205	-193	-5,170	-414	-5,777	-38,533	33.58		
2019	3,130	7,177	1,011	11,318	3,242	12,340	1,623	17,205	-112	-5,163	-612	-5,887	-44,420	34.22		
<b>5yr Avg 2015-2019</b>	<b>3,117</b>	<b>8,051</b>	<b>1,204</b>	<b>12,371</b>	<b>3,242</b>	<b>12,340</b>	<b>1,623</b>	<b>17,205</b>	<b>-125</b>	<b>-4,289</b>	<b>-419</b>	<b>-4,834</b>	<b>-33,615</b>	<b>28.09</b>		
2020	3,224	7,191	1,021	11,436	3,242	12,340	1,623	17,205	-18	-5,149	-602	-5,769	-50,189	33.53		
2021	2,962	7,785	916	11,662	3,242	12,340	1,623	17,205	-280	-4,555	-707	-5,543	-55,732	32.22		
2022	3,026	7,789	919	11,734	3,242	12,340	1,623	17,205	-216	-4,551	-704	-5,471	-61,203	31.80		
2023	3,169	11,844	870	15,882	3,242	12,340	1,623	17,205	-73	-496	-753	-1,323	-62,526	7.69		
2024	3,609	8,379	705	12,693	3,242	12,340	1,623	17,205	367	-3,961	-918	-4,512	-67,038	26.23		
<b>5yr Avg 2020-2024</b>	<b>3,198</b>	<b>8,598</b>	<b>886</b>	<b>12,681</b>	<b>3,242</b>	<b>12,340</b>	<b>1,623</b>	<b>17,205</b>	<b>-44</b>	<b>-3,742</b>	<b>-737</b>	<b>-4,524</b>	<b>-59,338</b>	<b>26.29</b>		
2025	4,115	7,802	1,285	13,201	3,242	12,340	1,623	17,205	873	-4,538	-338	-4,004	-71,042	23.27		
2026	4,475	8,106	1,112	13,694	3,242	12,340	1,623	17,205	1,233	-4,234	-511	-3,511	-74,553	20.41		
2027	4,971	6,603	1,232	12,806	3,242	12,340	1,623	17,205	1,729	-5,737	-391	-4,399	-78,952	25.57		
2028	4,851	6,600	1,153	12,604	3,242	12,340	1,623	17,205	1,609	-5,740	-470	-4,601	-83,553	26.74		
2029	3,795	6,604	954	11,353	3,242	12,340	1,623	17,205	553	-5,736	-669	-5,852	-89,405	34.01		
<b>5yr Avg 2025-2029</b>	<b>4,441</b>	<b>7,143</b>	<b>1,147</b>	<b>12,732</b>	<b>3,242</b>	<b>12,340</b>	<b>1,623</b>	<b>17,205</b>	<b>1,199</b>	<b>-5,197</b>	<b>-476</b>	<b>-4,473</b>	<b>-79,501</b>	<b>26.00</b>		
2030	4,016	7,834	965	12,815	3,242	12,340	1,623	17,205	774	-4,506	-658	-4,390	-93,795	25.52		
2031	3,937	7,793	859	12,590	3,242	12,340	1,623	17,205	695	-4,547	-764	-4,615	-98,410	26.82		
2032	3,027	11,869	862	15,758	3,242	12,340	1,623	17,205	-215	-471	-761	-1,447	-99,857	8.41		
2033	2,968	8,360	813	12,142	3,242	12,340	1,623	17,205	-274	-3,980	-810	-5,063	-104,920	29.43		
2034	2,916	7,784	705	11,405	3,242	12,340	1,623	17,205	-326	-4,556	-918	-5,800	-110,721	33.71		
<b>5yr Avg 2030-2034</b>	<b>3,373</b>	<b>8,728</b>	<b>841</b>	<b>12,942</b>	<b>3,242</b>	<b>12,340</b>	<b>1,623</b>	<b>17,205</b>	<b>131</b>	<b>-3,612</b>	<b>-782</b>	<b>-4,263</b>	<b>-101,541</b>	<b>24.78</b>		

Figures include allowances for Fire and Weather damage.

TABLE 26: SUPPLY AND DEMAND OF SAWLOGS (PRIOR TO ADJUSTMENTS)						
Year		Demand	Supply	Annual Shortage	Percentage Shortage	Accumulative Shortage
		(Paragraph 3.6)	(Paragraph 5.9)			
		(m <sup>3</sup> )	(m <sup>3</sup> )	(m <sup>3</sup> )	(%)	(m <sup>3</sup> )
2004	1	5,250,000	3,811,950	1,438,050	27%	1,438,050
2005	2	5,394,000	3,614,950	1,779,050	33%	3,217,100
2006	3	5,543,000	3,743,000	1,800,000	32%	5,017,100
2007	4	5,695,000	4,196,100	1,498,900	26%	6,516,000
2008	5	5,852,000	4,836,350	1,015,650	17%	7,531,650
2009	6	5,879,000	5,112,150	766,850	13%	8,298,500
2010	7	6,026,000	5,269,750	756,250	13%	9,054,750
2011	8	6,177,000	5,358,400	818,600	13%	9,873,350
2012	9	6,331,000	4,925,000	1,406,000	22%	11,279,350
2013	10	6,489,000	4,944,700	1,544,300	24%	12,823,650
2014	11	6,522,000	4,688,600	1,833,400	28%	14,657,050
2015	12	6,686,000	5,072,750	1,613,250	24%	16,270,300
2016	13	6,853,000	4,649,200	2,203,800	32%	18,474,100
2017	14	7,024,000	5,653,900	1,370,100	20%	19,844,200
2018	15	7,200,000	6,284,300	915,700	13%	20,759,900
2019	16	7,239,000	6,796,500	442,500	6%	21,202,400
2020	17	7,420,000	7,062,450	357,550	5%	21,559,950
2021	18	7,606,000	4,993,950	2,612,050	34%	24,172,000
2022	19	7,796,000	5,634,200	2,161,800	28%	26,333,800
2023	20	7,991,000	6,688,150	1,302,850	16%	27,636,650
2024	21	8,038,000	6,589,650	1,448,350	18%	29,085,000
2025	22	8,239,000	6,018,350	2,220,650	27%	31,305,650
2026	23	8,445,000	6,146,400	2,298,600	27%	33,604,250
2027	24	8,656,000	5,279,600	3,376,400	39%	36,980,650
2028	25	8,873,000	4,875,750	3,997,250	45%	40,977,900
2029	26	9,094,000	4,708,300	4,385,700	48%	45,363,600
2030	27	9,322,000	4,708,300	4,613,700	49%	49,977,300
2031	28	9,555,000	4,708,300	4,846,700	51%	54,824,000
2032	29	9,794,000	4,708,300	5,085,700	52%	59,909,700
2033	30	10,038,000	4,708,300	5,329,700	53%	65,239,400

SOURCE: Supply and Demand Study of Softwood Sawlog and Sawn Timber in South Africa by Crickmay & Associates (2004)