Plantation Forestry in Tasmania

The current resource, current processing and future opportunities

Graham Green

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Summary

Tasmania with 146,640 ha of hardwood and 76,100 ha of softwood plantation has 13% of Australia's plantations. The area of plantations represents about 14% of the total commercial forest in the State.

Tasmania's plantation estate is expanding rapidly at an average rate of 13,500 ha/year for the last 5 years, most of which is hardwood. Plantation expansion is largely occurring at the expense of native forest. Since 1999, the conversion rate of native forest to plantation has been 80% on private land and 65% on public land.

There are several drivers of the plantation expansion including: investment by off-shore manufacturers to produce pulpwood on short rotations under joint venture arrangements; domestic prospectus-based investment that provides tax deferral benefits; and the attractiveness of trading in carbon credits.

Private interests are becoming an increasingly dominant factor in controlling the product flow, marketing and end uses of Tasmania's plantation timber. Currently, 62% of plantation trees are privately owned and 27% as joint ventures. Although 40% of plantations are on public land just 11% of the trees are publically owned.

The biggest private plantation owner is Gunns Ltd with 80,000 ha of eucalypts, some of which have been established as joint ventures with its Japanese woodchip customers. The largest softwood holding in the State is currently 42,000 hectares jointly owned by Forestry Tasmania and American multinational GMO Renewable Resources Ltd.

In 2002-03 10,110 hectares of plantation was harvested in Tasmania from which over 2.5 million tonnes of plantation logs from public and private sources were produced. Most of these logs (around 70%) were woodchipped some of which were then exported and some used for the production of paper at Wesley Vale and some used for the production of fibre-based panels. Sawlog, almost exclusively pine, accounts for approximately 22% of the plantation log supply whereas export logs and roundwood account for 6%.

There are currently an estimated 1,115 plantation manufacturing jobs in Tasmania. The bulk of the jobs are in newsprint manufacturing (353), paper (290), sawmilling (310) and panels (110).

- There are 1.4x as many manufacturing jobs per m^3 of timber harvested from plantation forests than from native forests. This is poorer than in 1997 when plantations supported 3x more manufacturing jobs per m^3 than native forest wood.
- Woodchips and pulpwood now constitute 72% of plantation product whereas it was 60% in 1996.
- There is now an increased emphasis on short rotation plantation hardwoods for pulp production.
- Plantation production is becoming increasingly export commodity driven and increasingly controlled by joint ventures with overseas partners.
- In 2002-03 plantations produced 59% of Tasmania's sawn timber yet they represented just 22% of the area logged.

The report investigates ways in which the value of Tasmania's plantation estate may be maximised.

Increase intensive forest management (IFM). Under IFM, special thinning, pruning, fertilising and harvesting techniques are employed to maximise the scale, quality and economic value of plantation resources. This is the best way to maximise the output of quality timber aimed at high value markets.

Reduce export and process locally. Currently plantation raw materials fetch anything from \$5-30 m^3 in royalty and are worth \$65-84 m^3 once transported to a point of export. Manufacturing the plantation timber locally increases the export value of the plantation product by as much as 20x. Local processing of currently exported plantation based woodchips and whole logs would make available an estimated 750,000 tonnes of pulpwood (hardwood & softwood) and 130,000 m^3 of whole logs (softwood). Processing this resource locally could achieve the following:

- \$250 million of new investment
- 375 new jobs
- \$174 million in increased product value – increasing the value of Tasmania's current plantation products by 16% to 1.26 billion.

Aim for high value markets. Production of veneers followed by engineered and manufactured timber products such as MDF (medium density fibreboard), LVL (laminated veneer lumber) and ESL (elongated strand lumber) are the best options for optimising Tasmania's plantation timber resource in terms of employment, investment and resource consumption. Sawn timber ranks as the best option for optimising jobs in relation to investment.

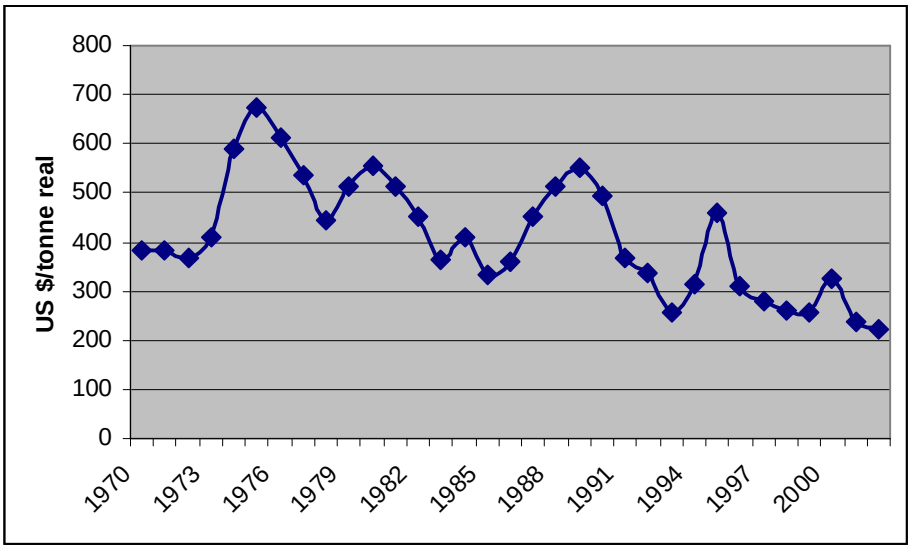
Is a pulp mill the answer? Construction of a pulp mill has the potential to significantly under-value the potential of the State's plantations and would be another example of a resource-hungry, low employment operation that would minimise Tasmania's options to adopt a range of innovative processing plants, for example, LVL will return 9x more jobs per tonne and veneer 22x more jobs per tonne of resource than a pulp mill.

There are significant question marks as to whether the plantation resource will be available to feed a new pulp mill even with an upbeat forecast of timber availability. Given no new plantation establishment, an estimated 6,640,000 (tonnes + m3) of plantation timber, primarily hardwood, will still be available annually from 2019, an increase of 170% on the current volume of 2,520,000 (tonnes + m3).

If the available timber was allocated to a new pulp mill it would consume most of the additional resource and create an estimated 300 new jobs for an investment of \$1.1 billion. Alternatively eight new enterprises, including new LVL, ESL, sawmilling and veneer plants could be established for a combined investment of \$770 million. The combined initiatives would require less resource than a pulp mill (2,000,000 tonnes) and create many more jobs (an estimated 1,320 new jobs).

The pulp mill option is made less attractive by the fact that the real world price for chemical wood-pulp is volatile and has been in decline in real terms since 1970.

Real price for world exports of chemical wood-pulp



Other important socio-economic & environmental factors that need to be weighed up in considering the future of plantation forestry in Tasmania are discussed and include:

- reduced stream flow and consumption of groundwater
- use of a suite of poisons – herbicides, pesticides, 1080 & fungicides
- soil compaction and erosion caused by harvesting operations
- soil nutrient decline and acidification
- visual impact following clearfelling.

Recommendations

Short term (1-5 years)

Reduce export of plantation woodchips and logs - process locally

Manufacturing plantation timber locally increases the export value of the plantation product by as much as 20x. Local processing of currently exported plantation based woodchips and whole logs would make available an estimated 750,000 tonnes of pulpwood (hardwood & softwood) and 130,000 m^3 of whole logs (softwood). Processing this resource locally could achieve the following:

- $250 million of new investment
- 375 new jobs
- $174 million in increased product value – increasing the value of Tasmania's current plantation products by 16% to 1.26 billion.

Increase intensive forest management

Under intensive forest management, special thinning, pruning, fertilising and harvesting techniques are employed to maximise the scale, quality and economic value of plantation resources. This is the best way to maximise the output of quality timber aimed at high value markets.

Reevaluate chemical use

In light of the ongoing controversy over the use of 1080 and recent controversy over aerial spraying there must be a move to:

- minimise the use of chemicals
- ban aerial spraying in accordance with calls made by the Australian Medical Association
- cease use of 1080, triazine chemicals and alpha-cypermethryn
- find alternatives to poisons
- establish more rigorous independent monitoring of chemicals
- cease chemical use in water catchments
- cease chemical use in proximity to organic farms - by defined buffer zones
- cease chemical use in catchments draining to areas used for aquaculture and fisheries.

Cease expansion of the plantation estate

There will be a tripling of current wood production from the existing plantation estate by 2019. The wood available will provide for a host of positive manufacturing options for Tasmania if used wisely with the best interests of the Tasmanian community and economy at heart. There is no need for extra wood beyond what is already coming on line, particularly as increasing the plantation estate comes at a significant social and environmental cost.

Due to conversion forestry, water yield, aesthetics, land productivity, chemical issues, and social issues further broad-scale plantation establishment should cease. Further

expansion should only occur if the plantations can be integrated into the landscape for mutually beneficial outcomes such as through farm forestry initiatives.

Greater transparency and access to information

Currently there is a proliferation of private forestry and joint venture forestry operations being conducted on public land. Tasmanians are getting less and less say into how their public forest land is managed and arguably less and less benefit as products and profits increasingly go to private interests and multinational companies.

There needs to be an enquiry into who is allowing the asset transfer to happen, who has made the decision, who is benefiting, and the long-term implications for the ownership of public assets that are essentially being privatised by stealth. Also, maps need to be made freely available showing: who owns what and which titles are earmarked for transfer to private interests.

Medium term (5-15 years)

Develop small, high value processing initiatives

Production of veneers followed by engineered and manufactured timber products such as MDF (medium density fibreboard), LVL (laminated veneer lumber) and ESL (elongated strand lumber) are the best options for optimising Tasmania's plantation timber resource in terms of employment, investment and resource consumption. Sawn timber is the best option for optimising jobs in relation to investment. Veneer will return 22x more jobs and LVL 9x more jobs per tonne of resource than a pulp mill.

Construction of a pulp mill has the potential to significantly under-value the potential of the State's plantations and would be another example of a resource-hungry, low employment operation that would minimise Tasmania's options to adopt a range of innovative processing plants. The argument for a pulp mill does not stack up in terms of investment, resource or employment grounds.

If the forecasted available plantation timber was allocated to a new pulp mill it would consume most of this resource for just 300 new jobs at an investment of $1.1 billion. Alternatively eight new enterprises, including new LVL, ESL, sawmilling and veneer plants could be established at less investment ($770 million), would use significantly less resource (2 million tonnes) and employ significantly more (an estimated 1,320 new jobs).

Implement restoration forestry

It is clear that there are problems with plantation forestry, for example:

- reduced stream flow and consumption of groundwater
- use of a suite of poisons – herbicides, pesticides, 1080 & fungicides
- soil compaction and erosion caused by harvesting operations
- soil nutrient decline and acidification
- visual impact following clearfelling.

Restoration forestry needs to be investigated as an option for the rejuvenation of degraded plantation land and has the potential to be a major industry in Tasmania in the future.

1.0 Introduction

It is a very important time for Tasmania's plantation industry. Tasmania's plantation processing industry has for several decades focused on the softwood radiata pine, which is currently used to produce sawn timber, pulp, newsprint, paper, panels and veneers. However, a significant amount of Tasmania's softwood plantation resource is currently exported as woodchips or as unprocessed whole logs. Part of the challenge for the future is to invest in innovative technologies that will enable the processing of this valuable resource locally in order to maximise the return to plantation investors and to maximise employment opportunities for Tasmanians.

Plantation hardwoods will potentially provide the cornerstone of the plantation sector into the future as there has been a great deal of recent investment in the establishment of hardwoods. The first fruits of the hardwood plantation resource are beginning to be borne with the export of woodchips and the milling of young plantation hardwood. Although there is relatively little plantation hardwood available at the moment, in ten years time it is estimated that Tasmania will have ten times the current extent of hardwood plantation and more than 5 million tonnes of plantation timber is expected to be available. With the huge investment in the establishment of hardwood plantations in Tasmania, the time is right to begin positioning for new products and new markets that will ultimately be available for such a significant forecast increase in wood availability.

A strong argument can be made for diversifying away from primarily pulpwood products which are resource hungry and do not deliver the employment benefits and export income benefits of more innovative products. It is time for Tasmania to capitalise on opportunities for value adding through solid wood production and engineered products such as laminated veneer lumber.

There has been no shortage of controversy over plantation establishment and management in Tasmania, particularly in relation to the conversion of native forests by clearfelling in order to establish the new plantations. The report investigates whether further plantation expansion is necessary and if so whether the expansion can be taken up on land that is not currently forested, such as unproductive agricultural land or as part of farm forestry initiatives.

Other current controversies over plantation establishment relate to the use of poisons for browsing control, to control weeds and to prevent insect attack. Additionally plantation timbers are becoming recognised for their significant impact on catchment water balance. This is an economic and social impact that needs to be weighed up against competing economic uses of water and also the ecosystem services that stream flow and groundwater provide.

This report provides an overview of Tasmania's plantation timber industry including the extent of the resource, who owns it, the rate of expansion, the current processors, current uses and the manufacturing employment generated. The report provides an analysis of the options Tasmania has for downstream processing the plantation resource now and into the future.

2.0 National context

As at December 2003 Australia had 1,665,693 ha of plantations of which 675,962 ha (41%) were hardwood (mainly eucalypts) and 988,223 ha were softwood species[1]. The plantation estate is steadily expanding with 82,000 ha/annum established in the five years to 2003. This expansion is in line with the target of the 'Plantations for Australia: The 2020 Vision' which contained a target of trebling Australia's plantations from 1997 to 2020.

Tasmania with 146,641 ha of hardwood and 76,104 ha of softwood plantation has 13% of Australia's plantations. However, Tasmania is now a national leader in the establishment of new plantations, particularly hardwood, and had the greatest new area established in 2003 (10,881 ha[2] - 26% of the national total).

2.1 2020 Plantation Vision

Plantations for Australia: The 2020 Vision is a strategic partnership between the Commonwealth, State and Territory Governments and the plantation timber growing and processing industry.

The overarching principle of the Plantations 2020 Vision strategy is to enhance regional wealth creation and international competitiveness through a sustainable increase in Australia's plantation resources, based on a notional target of trebling the area of commercial tree crops by 2020.

3.0 Overview of Tasmania's plantations

3.1 Plantations in context with other forests

As at 30 December 2003, Tasmania had 3.4 million hectares of forested land, including 76,000 hectares of softwood plantation and 146,000 hectares of hardwood plantation (total 222,000 hectares of plantations located on private and public lands)[3] (**Table 1**). The area of plantations represents about 14% of the total commercial forest in the State[4] (**Figure 1**).

[1] National Plantation Inventory 2004 update – Department of Agriculture, Fisheries and Forestry
[2] Ibid
[3] Forestry Tasmania Annual Report 2002/03 & National Plantation Inventory 2004 update
[4] DIER (2004). Rural land use trends in Tasmania. Davey & Maynard Agricultural Consultants.

Table 1: Summary of Tasmania's forested land

	State forest	Public reserves	Private land	Total area
Forest type				
Softwood plantation	54,000	1,000	21,000	76,000
Hardwood plantation	34,000		112,000	146,000
Total plantation	**88,000**	**1,000**	**133,000**	**222,000**
Tall native eucalypt forest(a)	493,000	6,000	150,000	878,000
Low native eucalypt forest(b)	337,000	14,000	685,000	1,548,000
Subtemperate (myrtle) rainforest(c)	176,000		22,000	567,000
Other native forest(d)	56,000	1,000	34,000	152,000
Total forest(e)	**1,149,000**	**22,000**	**1,010,000**	**3,353,000**

(Source: Forestry Tasmania, Annual Report 2002-03 & National Plantation Inventory 2004 update)

(a) Eucalypt forest with current or potential height of 34 m or more.
(b) Eucalypt forest with current or potential height of less than 34 m.
(c) With no significant eucalypt or acacia.
(d) Including acacia spp, melaleuca etc.
(e) Estimates have been rounded and minor discrepancies may occur between sums of component items and totals.

Figure 1: State forest production area 1998-2003

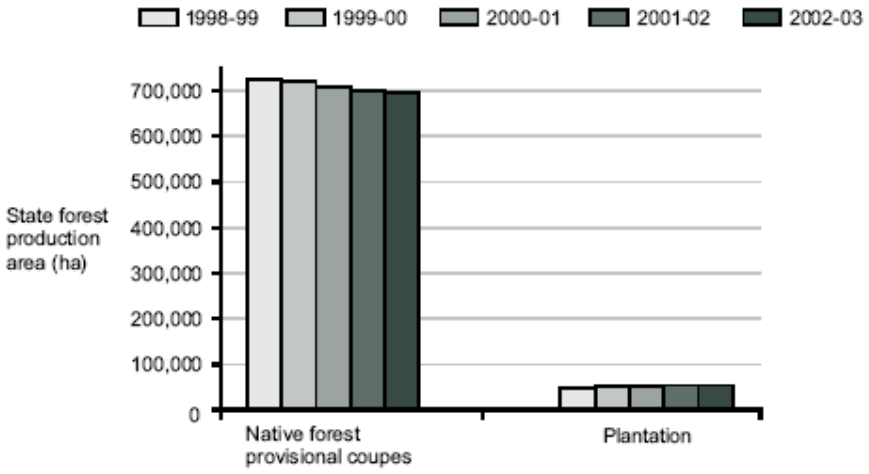


Figure source: Forestry Tasmania Sustainable Forest Management Report 2002-03

3.2 Plantation land ownership

On overview of plantation land ownership, as distinct from tree ownership (**Section 3.3**) is given in **Table 2**. Currently 60% of Tasmania's plantation land is privately owned, a trend that was continued with new establishments in 2003 (**Table 2**).

Table 2: Overview of plantation ownership in Tasmania as at December 2003

	Hardwood	Softwood	Total	%
Total plantations (hectares as at December 2003)				
Public	34,639	54,449	89,088	40%
Private	112,002	21,655	133,657	60%
Total	**146,641**	**76,104**	**222,745**	
Plantations established in 2003 (hectares)				
Public	3,681	1,146	4,827	44%
Private	5,804	250	6,054	56%
Total	**9,485**	**1,396**	**10,881**	

(Data source: National Plantation Inventory 2004 update)

3.3 Plantation tree ownership

An overview of plantation tree ownership in Tasmania is given in **Table 3**. More detail of tree ownership is given in **Figure 2**.

Table 3: Tasmania's plantations by tree ownership

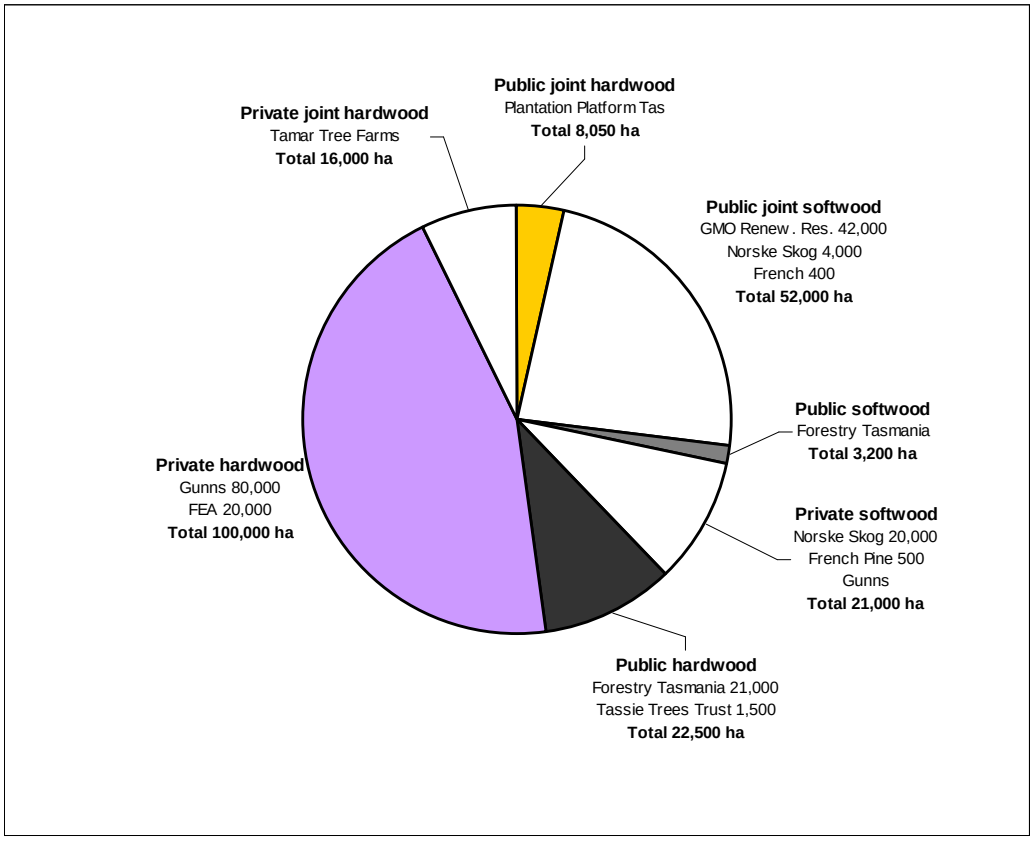
	Hardwood	Softwood	Total	%
Total plantations (Hectares as at Dec 2003)				
Public	22,511	3,192	25,703	11%
Private	116,082	21,004	137,086	62%
Joint*	8,048	51,908	59,956	27%
Total	**146,641**	**76,104**	**222,745**	
Plantations established in 2003 (Hectares)				
Public	1,075	5	1,080	10%
Private	8,193	250	8,443	78%
Joint(a)	217	1,141	1,358	12%
Total	**9,485**	**1,396**	**10,881**	

(Data source: National Plantation Inventory 2004 update)
(a) public and private parties have equity in the tree crop

Summary points from **Tables 2 & 3**:

- Although 40% of Tasmania's plantations are on public land only 11% of plantation trees are publically owned.
- In 2003 - 44% of new plantations were established on public land but only 10% of the trees were publically owned.
- Private interests are becoming an increasingly dominant factor in controlling the product flow, marketing and end uses of trees grown on State Forest.

Figure 2: Plantation tree ownership as at December 2003 (hectares)



Refer to **Section 3.4** (below) for detail of plantation ownership

NOTE: 76,100 ha (35%) of Tasmania's plantations are in joint venture arrangements under which most of the timber is earmarked for export, primarily for paper production.

3.4 The main plantation owners/managers

3.4.1 Gunns plantations and joint ventures

Gunns Ltd owns 175,000 ha of land in Tasmania more than half of this land is managed for the production of eucalypt plantations[5]. The company currently has joint venture arrangements with Forestry Tasmania and its major Japanese woodchip buyers, to establish an expanded eucalypt plantation resource. The development of plantations is funded through a combination of Gunns own funds, the prospectuses of Gunns Plantations Ltd and **joint ventures** with customers[6] for example:

- **Tamar Tree Farms** – a partnership with Mitsubishi Paper Mills and Tokyo Electric Power company[7]. The Tamar Tree Farms Joint Venture aims to establish 1,700 hectares of plantations per annum on a mixture of freehold, State forest and private property in the northeast of the state[8]. The objective of the venture is to supply woodchips from an estate of 25,500 hectares. Forecasts estimate 500,000 tonnes of wood to be available annually from 2012.
- **Plantation Platform of Tasmania** (PPT) – a partnership with Forestry Tasmania, Daio Paper, Kawasho International, Nakabayashi, Nissen, Nikkei BP, Kobunsha and NBS Ricoh[9]. PPT aims to create 7,500 ha of eucalypt plantations in northeast Tasmania over 15 years. The plantation timber will be used for woodchip production and processed in Japan by Daio Paper.

Gunns Ltd eucalypt plantations are managed solely for the production of pulpwood. Plantation wood currently comprises about 20% of their woodchip output, a figure that will rise when more plantations reach maturity[10].

3.4.2 Forestry Tasmania joint ventures

Forestry Tasmania owns some plantation land and timber in its own right but the majority of its holdings are in joint ventures. Forestry Tasmania's plantation joint ventures are summarised in **Figure 2** and **Table 4**. Under joint venture arrangements Forestry Tasmania provides the land, prepares the site, plants seedlings, provides ongoing plantations services and arranges harvest and sale of the trees for a range of customers and joint venture partners[11]. In all, 68% of Forestry Tasmania's plantations are in joint venture arrangements[12].

Most of the State's softwood plantation is jointly owned (50:50) by Forestry Tasmania and GMO Renewable Resources Ltd (a United States-based investment company) and managed by American multinational Rayonier Inc[13]. Rayonier is the

[5] www.privateforests.tas.gov.au
[6] www.gunns.com.au/Forest/plantations.html
[7] Ibid
[8] www.privateforests.tas.gov.au
[9] www.gunns.com.au/Forest/plantations.html
[10] Ibid
[11] www.privateforests.tas.gov.au
[12] Forestry Tasmania Annual Report 2002-03, p8.
[13] www.privateforests.tas.gov.au

manager of 42,000 ha of radiata pine located across the north of the State. Rayonier Tasmania is a subsidiary of Rayonier Inc., a United States-based forest products company, with land holdings in both the United States and New Zealand.

Rayonier specialises in the management and marketing of softwood timber and specialty pulp products, with sales to over 60 countries. Rayonier Tasmania's primary focus is on the management of the Softwood Joint Venture estate but has an interest in expanding that estate and the harvesting and marketing of radiata pine on private blocks[14].

Forestry Tasmania has also issued a number of Tassie Trees Trust prospectuses enabling people or organisations to become growers of commercial eucalypt plantations and has eucalypt joint ventures with Gunns Ltd and the Plantation Platform of Tasmania[15] (refer above) which aims to establish 500 ha of eucalypt plantations per annum on land owned by Forestry Tasmania[16]. Forestry Tasmania also has a softwood joint venture with Norske Skog Paper

Table 4: Forestry Tasmania's plantation ventures as at June 2003

	Softwood (ha)	Hardwood (ha)
Forestry Tasmania plantation on State forest and Crown Land	2,907	20,819
FT joint venture plantation on State forest and Crown land (a)	49,945	6,513
FT joint venture plantation on private land	598	253
Tassie Trees Trust plantation on State forest(b)	305	1,516
FT plantation on private land		278
Private plantation on State forest		3,709
Total	**53,755**	**33,088**

(Data source: Forestry Tasmania Annual Report 2002/2003)

(a) Most of these plantations are jointly owned by Forestry Tasmania and GMO Renewable Resources LLC and managed by Rayonier.

(b)Tassie Trees Trust plantations are mostly jointly owned with private growers

3.4.3 Norske Skog Paper

Norske Skog manages 24,500 ha of plantation (primarily *Pinus radiata)* in Tasmania, most of which is owned by the company, on freehold land or State forest[17]. The main focus of the company's plantation estate is to provide wood to meet the Boyer newsprint mill's needs.

[14] www.privateforests.tas.gov.au
[15] Forestry Tasmania Annual Report 2002-03, p18.
[16] www.privateforests.tas.gov.au
[17] Ibid

3.4.4 Forest Enterprises Australia

Forest Enterprises Australia (FEA) was incorporated in 1985 and began establishing its own eucalypt plantations in 1987, but expanded into the management of timber plantations on behalf of others in the late 1980s. FEA currently manages over 20,000 ha of plantation in Tasmania[18].

3.4.5 French Enterprises P/L

French Enterprises Pty Ltd owns and manages 473 ha of private radiata pine plantation and has joint venture interests totaling 362 ha[19]. Three of the joint ventures are with Forestry Tasmania and one with the Dorset Municipal Council.

3.5 What is the rate of plantation expansion?

In the past 50 years, a large plantation base has been established and is still rapidly expanding. The main species are the eucalypts Tasmanian Blue Gum (*Eucalyptus globulus*) and Shining Gum (*E. nitens*), Radiata pine (*Pinus radiata*) and some Blackwood (*Acacia melanoxylon*).

An increase in the area of plantations, particularly eucalypt plantations, has been a feature of recent years. While the majority of softwood plantations are grown on State forest (55 thousand hectares or 69.6% of all softwood plantations), the majority of hardwood plantations are grown on privately owned land (96 thousand hectares or 74.4% of all hardwood plantations)(**Table 3**).

The current rate of plantation expansion in Tasmania (based on last 5 years) is 13,500 ha per annum (**Table 5**).

Table 5: Total plantations established by calendar year (hectares)

	Softwood (ha)	Hardwood (ha)	Total
1999	2,374	16,467	18,841
2000	2,712	9,933	12,645
2001	2,643	12,310	14,953
2002	544	9,656	10,200
2003	1,396	9,485	10,881
Total	**9,669**	**57,851**	**67,520**

Data source: National Plantation Inventory 2004 update

[18] www.forestenterprise.com - the business

[19] Profiles of Northern Tasmania's core industry sectors. Northern Tasmanian Regional Development board (2002).

There was rapid expansion in eucalypt plantation establishment during 1996-2001 increasing in area by sixty percent or 44,000 hectares[20]. Plantation areas established on State forest since 1999 are given in **Table 5a**.

Table 5a: Plantations established on State forest

	Softwood (ha)	Hardwood (ha)	Total
1999/2000	3,900	4,200	8,100
2000/2001	2,700	4,300	7,000
2001/2002	3,500	4,500	8,000
2002/2003			7,350

Data source: Forestry Tasmania Sustainable Forest Management Report 2001-02 & Forest Practices Board Annual Report 2002-03.

Under the Forestry Growth Plan, revised targets for new Forestry Tasmania plantations are 4,500 ha/year of hardwood and 800 ha/year of softwood[21]. Growth of plantations on State forest is shown in Figure 3.

Figure 3: Area of plantation on State forest 1998-2003

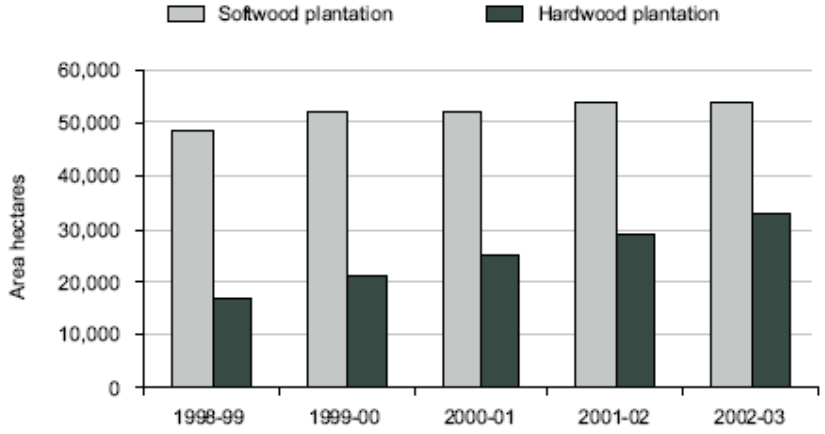


Figure source: Forestry Tasmania Sustainable Forest Management Report 2002-03

3.5.1 Plantation expansion drivers

There are several drivers of the plantation expansion including: investment by off-shore manufacturers to produce pulpwood on short rotations under joint venture arrangements; domestic prospectus-based investment that provide tax deferral benefits; development of the silvicultural knowledge to underpin short rotation production and to a lesser but emerging extent the attractiveness of trading in carbon credits.

[20] Forest Practices Board 2002, State of the Forest Report, State Government, Hobart.
[21] Forestry Tasmania sustainable forest management report 2002-03 p14.

3.6 Are native forests been converted to plantations?

A majority of the plantation expansion currently occurring in Tasmania is coming at the expense of conversion of native forest. Since 1999 80% of plantation expansion on private land and 65% of plantation expansion on public land has come at the expense of native forest (**Table 6**).

Table 6: Conversion of native forests to plantations

	Area clearfelled (ha)	Area converted to plantation or non-forest (ha)	% conversion
1999-00			
Public land	10,700	8,300	78%
Private land	9,600	7,500	78%
2000-01			
Public	10,210	6,990	69%
Private	7,890	6,460	82%
2001-02			
Public	8,070	5,320	66%
Private	4,960	3,960	80%
2002-03			
Public	8,150	3,330	41%
Private	6,450	5,090	79%
Totals 1999-2003			
Public	37,130	23,940	65%
Private	28,900	23,010	80%
Total all forest	**66,030**	**46,950**	**71%**

Data source: Forest Practices Board Annual Reports

3.7 Are plantations being established on prime agricultural land?

In 2002/03 2,870 hectares of new plantations were established on cleared land[22] (97% of this was on private land). This compares to 8,420 hectares of plantation that replaced native forest in the same period (**Table 6**). There has been ongoing controversy in Tasmania about the establishment of plantations of prime agricultural land and the impact this land conversion is having on the sustainability of rural communities, particularly in terms of employment opportunities, lifestyle, social infrastructure, landscape change, and catchment water quantity and quality. The following Table (**Table 7**) shows plantation land classification as at June 2003. The

[22] Forest Practices Board Annual Report 2002-03, p15.

information demonstrates that a minority of plantations have been established on prime agricultural land.

Table 7: Plantation land classification

	Hardwood (ha)	Softwood (ha)	Total (ha)
Class 1-3 (prime agricultural land)	5,000 (4%)	300 (<1%)	5,300 (2.3%)
Class 4 (little or no suitability for cropping)	20,000 (15%)	3,400 (4%)	23,400 (11.3%)
Class 5-7 (unsuitable for cropping & marginal suitability for grazing)	106,000 (81%)	72,000 (95%)	178,000 (86%)
Total	**131,000**	**76,000**	**207,000**

Data source: DIER (2004). Rural land use trends in Tasmania. Davey & Maynard Agricultural Consultants.

Plantations must be grown on sites capable of sustaining adequate growth rates. Consequently there will always be significant pressure to establish plantations on productive land if it is available.

3.8 Plantation age classes

3.8.1 Plantation area and age class

Plantation age classes are given in **Table 8**. The data shows how much plantation was established in five-year age classes and provides an indication of resource availability in the future. Although significant softwood plantation establishment has been occurring since the early 1970s, significant hardwood plantation expansion didn't begin until the late 1980s. Forecast plantation timber availability (based upon a continuation of the current rate of expansion) is discussed in **Section 6.1**.

Table 8: Area of Tasmanian plantations in five-year age classes, 2001

Age classes	Plantation area (ha)	
	softwood	**hardwood**
unknown	5,100	11,200
Pre-1960	300	200
1960-64	200	100
1965-69	3,000	0
1970-74	7,300	300
1975-79	11,300	1,200
1980-84	12,300	4,700
1985-89	10,600	15,700
1990-94	11,200	28,500
1995-99	15,200	36,900
2000-04(a)	3,900	18,800
Total	**80,400**	**117,600**
Latest figure(b)	**76,104**	**146,641**

Data source: Forest Practices Board 2002, *State of the Forest Report*, State Government, Hobart & RPDC (2002) review of the Regional Forest Agreement, p45.
(a) Only two years of planting data were available for this period.
(b) National Plantation Inventory 2004 update.

3.9 Where are the plantations?

Tasmania's plantation estate is depicted in **Figure 4**. Plantation extent by bioregion and catchment is given in the subsequent two sections.

Figure 4: Plantation map of Tasmania

3.9.1 Plantations by catchment

The largest percentage areas of plantation development by catchment occur in the Cam and Emu catchments in the north of the State, which contain 7,770 ha of softwood and hardwood plantations (26.9% of the area of the catchment) and 7,523 ha (29.5% of the area of the catchment), respectively[23]. The Arthur River catchment contains 16,632 ha of plantation, the largest total area of plantation within a catchment[24] (**Appendix 1**).

3.9.2 Plantations on karst

Plantation development presently occurs in only isolated areas containing karst in Tasmania, but is most prevalent in Permian limestones. This karst type has a total area of 21,640 ha with plantation development occurring on 1,017 ha (4.7%)[25]. Plantation development is a potential issue for management of karst in some parts of Tasmania. Karst systems rely on the maintenance of hydrologic and geomorphic processes, which depend on water availability and water quality[26].

3.10 Specialty plantations

Tasmania's specialty timber trees such as myrtle, celery-top pine and sassafras are not ideally suited to growing in plantations due to slow growth rates and susceptibility to dessication and browsing pressure. Plantations of blackwood have however been established in the State. In relation to other specialty timbers, blackwood is fast growing and in 1997 there were 780 hectares of blackwood plantation.

Pure plantings of blackwood have shown poor form in Tasmania with multiple branching and seedling loss due to frost and browsing[27]. Plantation grown blackwood requires pruning to correct form and produce quality sawlogs and the use of 1080 poison is used to control browsing[28]. The rotation objective for blackwood sawlogs is 40 years. The economics of plantation grown blackwood have been described as 'satisfactory' but not as good as the return on growing radiata pine[29].

[23] Private Forests Tasmania 2002, Forest Group Data v.2, Private Forests Tasmania, Burnie, www.privateforests.tas.gov.au
[24] Ibid
[25] Private Forests Tasmania 2002, Forest Group Data v.2, Private Forests Tasmania, Burnie, www.privateforests.tas.gov.au
Ibid
[27] Neilsen & Brown (1997). Growth and silviculture of *Acacia melanoxylon* plantations in Tasmania. Tasforests 9 p51
[28] Ibid
[29] Ibid