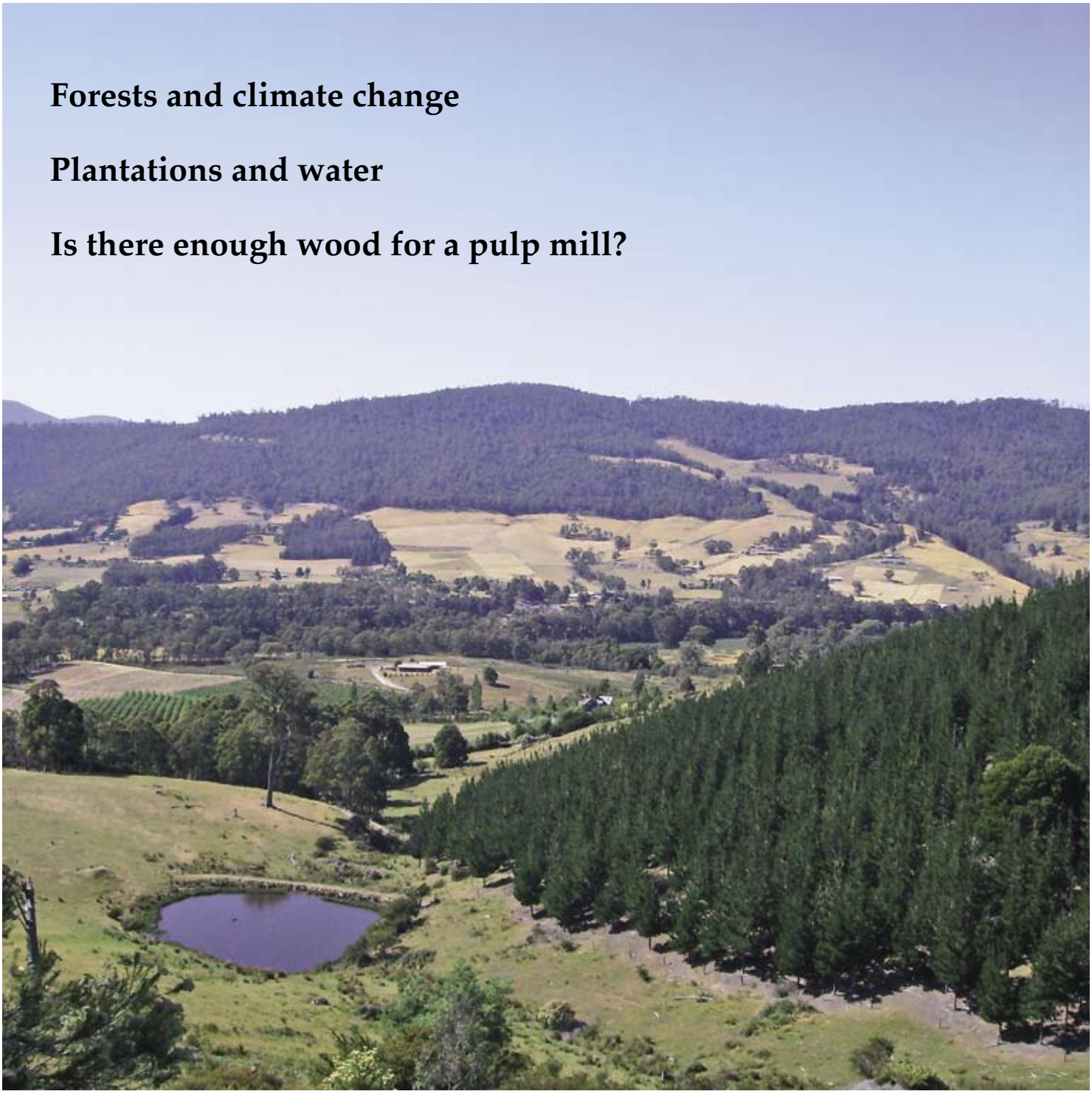
TREELine

PRIVATE FORESTS TASMANIA

Forests and climate change

Plantations and water

Is there enough wood for a pulp mill?



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Tasmania

Welcome

The environmental benefits provided by properly managed native and plantation forests are becoming increasingly important in the formulation of forest and environmental policy. This is particularly so when discussion is centered around the impacts of greenhouse gas emissions on climate change, and the very positive role that forests play in helping address these emissions.

In this edition of TREELine, there is a brief introductory article to the role that forests play in helping address climate change. There is a burgeoning amount of information on this area, and readers can find more detailed information from the Australian Greenhouse Accounting Office, among other sources.

As May is the time for the annual Agfest event, this edition of TREELine features articles on the four issues which Private Forests Tasmania will be highlighting at our Agfest site. We welcome any readers to come and visit us when at Agfest and discuss not only the issues raised in this edition but any issues relevant to private forestry.

We have also enclosed with this edition a flyer from the Forest Conservation Fund, an Australian Government program that was part of the Government's 2004 election package. Private forest owners who own any old-growth forests, or forests that are under-represented in the CAR reserve system, could consider their options under the program. Private Forests Tasmania is happy to help on a consultancy basis any interested landowners who wish to appropriately value their forests for tendering under the program.

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Cover photo: Pine plantation and native forest regrowth integrated with farming pratices, Huon Valley.

Private Forests Tasmania promotes sustainable management of native forests and plantations, and fosters the use and value of trees in land management.

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Forests and climate change

It is now widely accepted that the increased presence in the earth's atmosphere of greenhouse gases is a major contributor to climate change. While there is continued and robust debate about the extent of such contribution, there can be little doubt that an overall reduction in the amount of greenhouse gases will be beneficial.

There are six main greenhouse gasses (CO_2, CH_4, N_2O, HFCs, FCFs and SF6) but the one that gains most attention in the media and public debate is CO_2 (carbon dioxide) and it is in respect of this that forests can and do play an important role.

Global emissions of carbon due to industrial development have been increasing for about the last 140 years, since the beginning of the Industrial Revolution. The largest increase has occurred within the last 55 years.

In Australia, the net emission of greenhouse gasses in 2003-2004 was approximately 323 million tonnes with 43 million tonnes of CO_2 (Ximenes, Robinson & Wright, 2006). While this seems a huge number, to put this in a global perspective, it represents about 1% of total global greenhouse gas emissions.

And to put it in a personal perspective, it has been estimated by the Australian Greenhouse Office that the average Australian passenger car, traveling around 14,000 km per year, generates about 4.3 tonnes of carbon dioxide each year. Trucks can produce about three times as much per kilometer. One hectare of a eucalypt plantation can sequester enough carbon dioxide in an average year to offset the annual travel of about five passenger cars.

Forests do not provide the sole answer as industry and individuals need to do more to reduce emissions of greenhouse gases, but they do offer an important way of reducing carbon dioxide in the atmosphere through storing carbon in the trees, in understorey plants and in the soil within the forest.

Australia's forests are estimated to currently store a total of 10.5 billion tonnes of carbon ["Australia's Forests At A Glance, 2007"]. This is equal to about 477 years of Australia's annual carbon emissions.

Removing carbon dioxide from the atmosphere

All plants capture CO_2 from the atmosphere via photosynthesis and convert this carbon to biomass.

Trees absorbing carbon - Northwest Tasmania

Trees store much more carbon than other plants. Trees are generally larger than other plants and have woody trunks and branches. Trees store carbon for relatively long periods of time compared with other plants, as trees generally live longer than other plants. The largest portion of carbon in the earth's terrestrial ecosystems is stored in forests.

About half the dry-weight of a tree or wood product is carbon. Dry weight is the weight of the tree once most of the water (around 85 percent) has been removed. One tonne of carbon stored within a tree represents 3.67 tonnes of carbon dioxide that has been removed from the atmosphere. Carbon stored in wood is released back into the atmosphere only when the wood or wood product decays or is burnt. When wood is burnt charcoal can be created and charcoal can take considerably more time to decay.

Carbon dioxide can be removed from the atmosphere when other forms of land cover such as crops or grasses are converted to forest. Establishing forests, including plantation forests as well as regenerating cleared forests, coupled with sound and efficient management practices, is a positive move to store carbon and reduce carbon dioxide in the atmosphere.

What is carbon sequestering?

Forests are capable of sequestering or capturing carbon and storing atmospheric carbon from CO_2. This process is part of the carbon cycle. See Figure 1. Carbon is stored in the forests in 'above ground' biomass eg, foliage, branches, bole, as well as 'below ground' biomass consisting of the root systems, organic matter and soil. Carbon is absorbed and then stored as carbon rich organic compounds such as cellulose, hemicelluloses, lignin, starch, lipid and waxes. This is achieved though the processes of photosynthesis and tree growth. The maximum rate of carbon assimilation is achieved in conjunction with the maximum growth rate of a tree species, with mature forests able to store large quantities of carbon for the life of the forest (Unwin & Kriedemann, 2000).

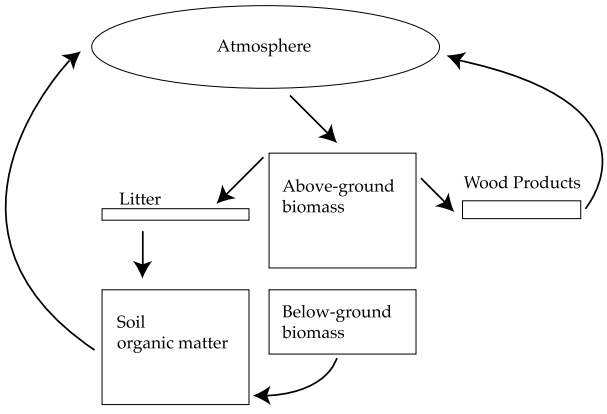


Figure 1. The carbon cycle

One hectare of a eucalypt plantation can sequester enough carbon dioxide in an average year to offset the annual travel of about five passenger cars

The new and growing forests are the real 'lungs of the earth'.

There is a popular myth that old-growth forests are the most effective way of continuing to store carbon. However, once a forest is mature, its ability to take up carbon declines. New growth on the over mature trees absorbs carbon but carbon is released with the decay of the over mature forest. Harvesting forests and regenerating is a more efficient and effective means of carbon storing than leaving a forest to become an old-growth forest. The wood removed from the forest is used in wood products and becomes part of a carbon store. The wood used to build a house also stores carbon, and is only released when the house is destroyed. When the area harvested is regenerated, more carbon is captured and stored in new wood. [There may be many very good and sound reasons to conserve old-growth forests, but continued carbon storage is not one of them.]

The CRC for Greenhouse Accounting has produced a model to compare the carbon storage in an un-harvested forest over 200 years with a forest that is harvested on a 35-year rotation basis for the same period. The findings are that at the end of the 200-year period the carbon stored in the forest that is harvested together with the carbon stored in the wood products from those trees harvested, is more than double the carbon stored in the forest that is left un-harvested.

Why use wood?

Wood products have important environmental advantages over alternative building materials in addition to storing carbon from the atmosphere. By choosing wood products wherever possible in house construction, greenhouse gas emissions equivalent to up to 25 tonnes of CO_2 per house could be saved in Australia. Construction materials such as aluminum, cement and plastic products require large energy inputs, usually from fossil fuels, during manufacture. The manufacture of wood products typically requires less energy than competing materials (Ximenes, Robinson & Wright, 2006).

Plantations and water

In Tasmania, tree plantations are regarded as an agricultural land use, and like all crops they use water. There are no specific restraints on the extent of a particular land-use in any catchment apart from land-use zones in local planning schemes and legislation such as vegetation clearing controls. Nearly all of the current agricultural land was originally forested. Clearing for agriculture has significantly altered the natural hydrological balance across the landscape.

With appropriate plantation planning and management, plantations can be a viable and positive part of the rural economy with minimal impacts on stream flow.[1]

Plantations can fight dryland salinity, absorb green house gases and create new wood resources to reduce the dependence on timber from native forests and imported products. Plantations are significant contributors to many rural economies and since 1998 $3.4 billon has been injected into regional communities for plantation forestry. The plantation industry also can significantly contribute to regional economies. For example, in the Mount Gambier region of South Australia, agriculture (including 'high value' products such as dairy and wine) uses 10 times as much land as plantations but produces only 25% more regional economic output (including the contribution by local processing of plantation products).

In Tasmania the average catchment area planted to plantations is about 6%. Scientists believe that as a generalisation, only where more than 20% of a catchment is planted to a high water using, rapidly growing forest is any impact on surface water yield detected. Plantations are often established in areas of high annual rainfall (above 1,000mm/yr) because trees will grow faster, produce more wood and increase the financial return on the investment.

Tasmania has about 237,200 hectares of plantations[2], which represents about 3.5 per cent of its total land area. The proportion of plantations and other land uses in some major catchment groupings is shown below.

Land use in areas with more than 600mm average annual rainfall

Catchment land use	Tamar, Esk	North-west Tasmania[A]
Plantations	3.4%	9.6%
Agriculture	29.9%	35.0%
Forests and woodlands	63.9%	54.1%
Other	2.1%	1.2%

[A] *North-west Tasmania is the Smithton-Burnie Coast, Mersey, Rubicon and Forth River catchments*

Hydrology concerns water movement and storage above and below the ground. The majority of water resources are not seen as they are stored underground. Trees influence catchment hydrology as they take up water from the soil and transpire through the leaves, intercept or store rainwater on branches, leaves and forest litter on the ground and take up water from ground-water-tables.

How much water do trees use?

Tree water use depends on a complex combination of factors – soil texture, structure and water holding capacity, catchment topography, water-table levels, annual rainfall, sunlight, temperature, wind, humidity, tree species and age. Water use is also influenced by plantation management including harvesting. The impact of plantations on ground-water recharge also varies with the proportion of the catchment planted to plantations.

The effect on stream flow of converting agricultural land to plantation depends on the proportion of catchment area affected. It is difficult to detect scientifically an impact on stream flow in catchments smaller than 1,000 hectares where less than 20% of a catchment is planted and rainfall is uniform across the catchment. In larger catchments this is not the case and impacts on run-off depend on location of plantations in relation to rainfall and other land uses. A plantation's water use increases after planting, reaches a peak when the growth rate is highest (10-20 years after planting) and is less for some years after plantations are thinned. The hydrological impact can vary depending on the location of plantations in catchments. These and other factors should be taken into account when considering whether plantations will have a significant hydrological effect.[1]

Trees use more water than pasture.

Figure 1 shows the water used by trees (native forest) and pasture (grass).[3] The solid line curves have been developed for 19 catchments in Victoria (by scientists Holmes and Sinclair) and the dotted line curves for over 250 catchments world wide (by scientist Zhang). The curves show that, as rainfall increases above 500mm/yr, trees use an increasing amount of water compared to grass. For example, where the annual rainfall is 600mm/yr trees transpire 40 mm/yr more water than grass. Where the annual rainfall is 800mm/yr the difference increases to 90mm/yr and at 1300mm/yr rainfall the difference increases further to 215mm/yr. (100mm of annual rainfall equals 1.0 megalitre of water)

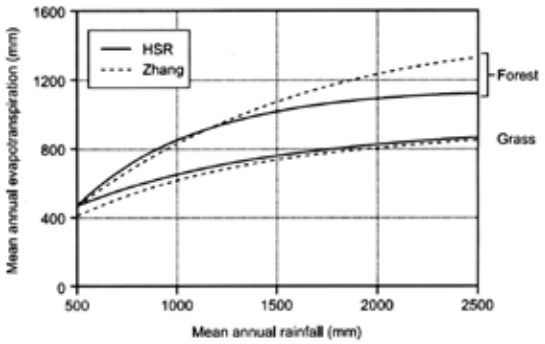


Figure 1. Water use by forests, plantations and grass.

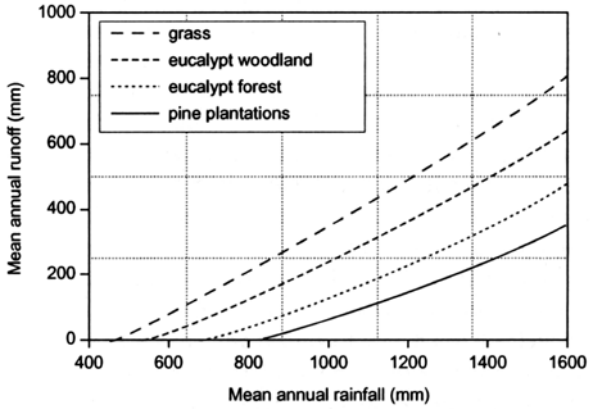


Figure 2. Run-off from grass and trees

Trees influence the amount of water flowing in streams. This 'run-off' is often measured as 'stream-flow' at points (stream gauging stations) low in the catchment. Research in southern NSW shows that as rainfall increases so does the difference in run-off between grass and trees. Scientific modeling shows where catchments are completely planted to trees, run-off will be reduced in high rainfall areas and pine plantations will have a greater impact than eucalypts. As seen in Figure 2, the mean annual run-off for areas with 800 mm mean annual rainfall may decline by up to 165mm under eucalypt forest and up to 210mm under pine plantations when compared to grassland. For areas with mean annual rainfall of 1200mm, the decline may be up to 265mm for eucalypts and 350mm for pine.[3] Water use will be less depending on both the proportion of the catchment planted and its management.

Ground water is recharged by annual rainfall. Recharge by annual crops and pastures is higher than for trees. Studies show that for grassed catchments, with rainfall less than 700 mm, recharge ranges from 0 – 75mm and increases to 250mm for sites with greater than 700mm annual rainfall. Under trees there is no recharge until the mean annual rainfall exceeds 1100mm. In addition to reducing recharge, trees can also draw down water-tables and this is desirable where rising water-tables need to be controlled.

Water users are concerned about the distribution of run-off and periods of low flow especially when stream flows are naturally low either in late summer or during periods of prolonged drought. To date science has had difficulty predicting the effects of plantations on low flows because of variability of rainfall and erratic run-off during dry periods. One reliable 10 year study at Tumut NSW showed that run-off only occurred for 60% of the time 10 – 15 years after planting a catchment to pine, whereas run-off continued all year from a grassed catchment.[4] Research in New Zealand showed that pine plantations reduced low flows by up to 20%. Generally it takes 15 – 20 years for the maximum impact on low flows to be felt. NZ research also shows that flood peaks can be significantly reduced by about 60% where catchments were completely planted and Australian research shows plantation development offers significant flood control as peak stream flows can be reduced by 50%.[4,5]

Forest hydrology is very complex and further research is needed to better estimate the impact of land-use during times of low stream flows. Scientists believe the estimated impacts of plantations can be reduced by:[1]

- Locating plantations in low to medium rainfall zones,
- Dispersing plantations across the landscape and keeping them to less than 20% of a catchment,
- Staggering plantings to give a spread of age classes,
- Thinning plantations to reduce tree stocking rate, and
- Where practical, choosing species that use less water.

[1] Keenan J.R, Gerrand A, Sadanandan N and Parsons, M. 2006 Science for Decision Makers, Plantations Impacts on Stream Flow, Department of Agriculture, Fisheries and Forestry (see http://affashop.gov.au/product.asp?prodid=13357).

[2] Source: National Plantation Inventory; areas are as at 2006.

[3] Vertessy, R.A. 1999. The Impacts of Forestry on Stream Flows – A Review, Report 99/6, CRC for Catchment Hydrology.

[4] Nambiar, E.K.S and Ferguson , I.S 2005, Newforests: Wood production and environmental services, CSIRO Publishing.

[5] Silberstein R, Adhitya A, and Dabrowski, C. 2003. Changes in fold flows, saturated area and salinity associated with forest clearing for agriculture, Technical Report 03/1. CRC for Catchment Hydrology.

Arthur Lyons, Regional Private Forester, North East

Wood – using it wisely

The supply of wood from our forests is rapidly changing to a resource dominated by regrowth and plantation forests. The inherent characteristics of the timber produced by these forests are different to the traditional mature timbers: they typically have more tension, they have smaller dimensions, they are more prone to instability and often differ in appearance. These differences provide challenges to the processing sector to utilize the resource efficiently.

The following 3 examples demonstrate innovative methods developed by the timber processing sector to effectively use the timber produced by our regrowth and plantation forests.

A new sawmill for small logs

The Kara PPS 500 is a newly developed machine by Kallion Konepaja, Finland, that is capable of converting small logs (70 to 270mm in diameter, 1.5 to 4m long) into dimension sawn timber.

In the past, there were very few options for milling small logs, the produce was often used to produce lower value roundwood products and sometimes thinned to waste. However, with the Kara PPS 500 a large proportion of logs previously destined for waste, fencing, firewood or pulpwood can now be processed into sawn products.

The Kara PPS 500 is a multiple rip saw that can rapidly release tension from notoriously springy eucalypt logs, resulting in consistently dimensioned boards. The system is equally suited to hardwood and softwood situations. Blades are easily changed to convert the machine from a twin edger to multirip saw.

The Kara PPS 500 can be a static or mobile operation and can form a component of a larger sawmill layout. It is self-contained with driven infeed and outfeed rollers over a single arbor using tractor or electric power.

It is ideal for producing:

- building timber
- flooring
- posts, rails and palings
- boards and bearers for pallets or fruit bins
- small section timber for laminating.

The Kara PPS500 cuts logs 70 - 220 mm in diameter and 1.5 – 4m in length

Power supplied by a 50-75hp tractor or electricity

Driven in-feed and out-feed rollers for sawing over a single arbor. Blades are easily changed from twin edger to multi-rip pattern

www.karasaw.com

The Huon Wood Centre

The Huon Wood Centre is located on State forest near the Huon River.

The centre is designed around new ways to process wood. It involves making a range of value-added wood products all on the one site, getting maximum value from our wood close to the forest where the wood is grown.

It is different to the traditional way of doing things, where the forest is harvested for sawlogs, veneer logs, woodchips and firewood. All the short and smaller pieces of logs and residue are burnt in the forest.

The Huon Wood Centre will see harvested logs carted to the one central site for processing. Every piece of wood will be productively used. At this new site, the logs will be sorted for best value and processed. Only market-ready products will leave the site.

Based on its quality, the wood will be used for:

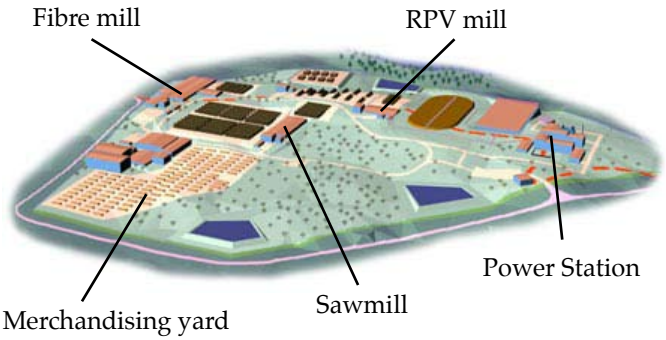
Process	Products
Timber harvesting	Logs; residues
Merchandising	Converts logs to sawlogs; veneer billets; pulpwood; residues
Sawmilling	Converts sawlogs to sawn timber; wood fibre; residues
Rotary Peeling	Converts veneer billets to rotary peel veneer sheet for plywoods and laminated veneer lumber; wood fibre; residues
Electricity generation	Converts residues to clean electric power for the site and sale to the electricity network and heating for timber drying

Neville Smith Timber has constructed, and is operating, a state of the art sawmill at the centre. They will be joined this year by Forestry Tasmania building a merchandising yard and Ta Ann Tasmania Pty Ltd who will build a rotary peel veneer (RPV) mill.

Island Specialty Timbers will also establish a presence on the site supplying Tasmanian signature species such as celery top, sassafras and myrtle to sawmillers and craftsmen.

As these forms of processing are established on the site, up to 30% more solid timber products will be recovered from the same area of forest.

The plan is not about harvesting more forest. The plan is to get more value from the timber already being harvested.



A conceptual plan for the Huon Wood Centre

The Huon Wood Centre (left), Regrowth log processing at the new Neville Smith Timbers Sawmill (centre), Pulp logs will be delivered to the wood fibre facility where they will be processed (right)

www.southwoodresources.com.au

EcoAsh™

Forest Enterprises Australia Ltd (FEA) is a pioneer in the creation of *EcoAsh*™. *EcoAsh*™ is about creating sawn timber products from renewable, plantation grown eucalypts. This strong, durable timber is suitable for a wide range of everyday uses.

FEA processes the logs in its state-of-the-art mill facilities at Bell Bay in Tasmania using the groundbreaking Finnish HewSaw technology. The HewSaw releases the growth tension and stresses in the timber during processing. The result is a timber product that is both stable and structurally sound. The HewSaw also allows for small-diameter logs to be processed, thereby maximising recovery of timber from traditional plantation pulp logs.

EcoAshTM comes with its own standard known as Plantation Grade Hardwood or PGH 20. This is a standard indicating a significant level of strength and stability – characteristics common to all EcoAsh sawn timber products. The PGH 20 rating means *EcoAsh*™ is suitable for a range of applications in building construction, particularly framing, including studs, bearers, joists and trusses in residential, commercial and industrial building work.

In addition, the attractive light pink to blonde colour and feature characteristics lend itself ideally to be used for a range of flooring and lining applications.

EcoAsh™ product benefits are:

- strong: suitable for a range of building applications
- stable: will remain straight and strong
- sustainable: harvested from Australian-owned hardwood plantations
- attractive: light pink to blonde with a range of feature characteristics.

Please refer to previous articles on the HewSaw and *EcoAsh*™ in the Autumn 2006 TREELine, www.privateforests.tas.gov.au

www.forestenterprise.com

Rob Smith – Private Forest Advisor

Forestry and the need for balance

For many private landowners, forestry remains an extremely valuable enterprise, not only from a direct production point of view but also from the point of view of small woodlots and plantations providing shelterbelts and stock havens among other benefits.

Yet many of these landowners are increasingly finding themselves frustrated by the attempts of others to impose their views on the world and restrict or prohibit activities with which they do not agree. A very public and current example of this is the court action taken by a landowner in Meander Valley to prevent a neighbour lawfully carrying out forest harvesting in accordance with an approved forest practices plan.

Rarely, if ever, is any consideration given by those who bring such actions to the economic consequences for landowners of their actions. As a fundamental principle, if the community (or an individual) wishes to impose their views on a private landowner wishing to undertake lawful activities, then the community (or individual) should be prepared to pay compensation.

The Tasmanian Government has established a review of the Protection of Agricultural Land Policy, and many submissions were made to the review, which is nearing completion. One of the most important components of the review is dealing with the issue of fettering of appropriate agricultural activities in rural areas. It is important that forestry activities are permitted to continue in rural areas – and that local councils, political lobby groups and anti-forestry organisations are not able to effectively eliminate forestry from the rural mix through planning schemes and zoning policies or via media campaigns based not on fact but polemic.

Private landowners invariably regard themselves as custodians of their land. It is in not only their interests but the interests of their heirs and successors to ensure that forest practices are undertaken to the highest standards and that the land is not degraded over time. Private industrial companies share this same perspective – forestry is a medium to long-term activity that requires stewardship as well as management.

Improved forestry practices are always something that companies and individuals are exploring. Yesterday's aspirations have become today's standards and tomorrow's old ways. Yet the many values of forests and forestry are simply not fully appreciated by many in our community, and the balance of the debate on forestry needs to be restored.

Simon Eldridge Chief Executive Officer

Is there enough wood for a pulp mill?

Wood for a pulp mill is supplied from native forests, plantations, as sawmill waste or a combination of all. A wide range of fibre can be used to produce paper pulp, including hemp, cotton waste, straw and other organic material. The proposed pulp mill for Tasmania is to use wood fibre to produce paper pulp. Wood fibre can be in the form of logs, chips or waste from sawmills.

What is pulpwood?

A tree harvested in the native forest or plantation can be cut up into a number of different products, or log types. From the single tree it is possible to produce a range of saw logs, veneer logs and pulp wood logs.

A sawlog is a log being sold to saw in a mill and usually must meet specifications for diameter, length and any faults such as large branches, twist or straightness. Similarly, a pulpwood log is a log being sold to use to produce pulp. Pulp logs must meet specifications for diameter, length, species and any faults, such as presence of rot or carbon.

Forestry Tasmania, the state owned grower, is legally required to supply 300,000 cubic metres per year of saw logs, and hence manage forest and harvesting to supply sawlogs. Private forest owners are not required to supply saw logs and will harvest forest and supply logs to saw millers based on market factors, such as the stumpages paid for the log. For private forest owners, the major reasons why a tree is sold primarily as a saw log or a pulpwood are the quality of the tree and the market.

Technically pulpwood is wood being used to produce pulp. The same log can be used as a sawlog or veneer log, and how it is used is largely determined by the species, size of the log and the return or stumpage paid to the owner for the log.

Native forest estate

Tasmania has extensive areas of native forest and plantation.

Not all the native forest in Tasmania is used to produce pulpwood. Only the dry and wet eucalypt forest types on multiple-use State forest and private land is suitable, where pulpwood can be harvested and the forest regenerated. In some forests the tree species are not suitable to use to produce pulp for paper production.

The forests have to be available to be used for wood production. Under Tasmanian law National Parks and conservation areas are not available. Other areas on public land, State forest and private land are also not available under agreement with the Commonwealth government (the Regional Forest Agreement). Lastly, where harvesting for pulpwood is permitted, not all of the area is harvested and some areas are reserved under the *Tasmanian Forest Practices Act 1985* to protect natural and cultural values.

On State forest only 607,000 hectares is available for wood production. On private land, it is estimated that only 575,000 hectares is available for wood production. Overall, only some 38% of the native forest area of Tasmania is available for wood production.

Tasmania has a long history of forest use, and since the early days of European settlement in 1803 forests have been harvested to produce timber for ships and building, firewood and, with the first pulp mill in Burnie in 1937, to produce paper. Largely the same forests used to supply wood in the past are used today to supply wood to industry. The large tracts of forest in conservation reserve have never been used to produce wood.

Tasmania has an extensive system of conservation reserves. There area some 3 million hectares or 44.3% of the total land area of Tasmania reserved for conservation purposes. Some 1.4 million hectares of forested land, or 47%, of the native forests in Tasmania are reserved for conservation purposes.

Area of forest in Tasmania by tenure (hectares) as at June 2006 by forest type

Forest type	National Parks, conservation areas and forest reserves	Multiple State forest	Other Public land	Private freehold land	Total
Dry eucalypt forests	433 000	345 000	55 000	711 000	1 544 000
Wet eucalypt forests	229 000	462 000	11 000	119 000	821 000
Sub-alpine eucalypt forests	47 000	8 000	3 000	7 000	65 000
Non-eucalypt forests	413 000	210 000	15 000	48 000	686 000
Native forest Total	**1 122 000**	**1 025 000**	**84 000**	**885 000**	**3 116 000**

Source: Private Forests Tasmania 2006

Plantation estate

Plantations have been established specifically to supply pulpwood. These plantations have been established using species that produce wood fibre that makes good paper. Species such as *Eucalyptus globulus* and *E. nitens* have been planted because they grow quickly and produce fibre that produces good quality paper. Softwood plantations have been established to grow sawlogs.

The area of plantation includes both areas of plantation harvested and replanted as well as new plantings. Recent expansion in hardwood plantation has resulted from new areas being planted, and areas of softwood plantations harvested and replanted as hardwood plantation.

Area of plantations in Tasmania in 5-year age classes (as at December 2005)

Age Class	Hardwood plantations (hectares)	Softwood plantations (hectares)
<1951	100	100
1951-55	0	0
1956-60	100	0
1961-65	100	200
1966-70	100	1,800
1971–75	400	2,700
1976–80	600	6,700
1981–85	1,800	9,400
1986–90	8,900	9,800
1991–95	28,200	10,600
1996–00	50,100	17,400
2001–05	65,100	12,900
Totals	**155,500**	**71,600**

Source: National Plantation Inventory 2006

As with the native forest estate, the ownership of the plantation is important. In 2005, 12% of plantations were publicly owned (Forestry Tasmania), 25% jointly owned and 63% privately owned. Jointly owned means that public and private parties own shares of the tree crop, but does not mean a joint venture. The land where the trees are planted can be leased State forest or public land and the trees owned by a private company, or vice-versa.

Nationally, for all plantation types:

- 37% is owned by State government or their forestry agencies;
- 23% owned by managed investment schemes. The Australian Agribusiness Group estimates that up to 75,000 people own woodlots;
- 15% owned by timber industry companies;
- 13% by farm foresters and other private owners whose ownership ranges between a few hectares to thousands of hectares; and
- 12% by superannuation funds.

Source: National Plantation Inventory 2006

The 50% share Forestry Tasmania has in Taswood Growers, the owners of the softwood resource in the north of Tasmania, is included in the State government sector and the rest owned by GMO in the superannuation sector.

In Tasmania, it is estimated that there are 607,000 hectares on State forest and 575,000 hectares of native forest that is available to supply the pulp wood to the proposed mill. More importantly, there are also 142,100 hectares of private plantation, 57,700 hectares of jointly owned plantation and 27,400 hectares of public plantation that could be utilised to supply wood to the proposed mill.

Where will Gunns Ltd find the wood for the proposed mill?

The proposed mill is designed to produce 820,000 to 1,100,000 tonnes of air-dried pulp. To produce this volume of fibre 3.2 to 4.0 million of green metric tonnes (GMt) of wood is required. For each tonne of pulp, 4 tonnes of wood is required.

In the last five years, Gunns Ltd has exported 4.7 million GMt annually. This wood has been supplied by Forestry Tasmania, private forest owners and harvested from forest and plantation owned by Gunns Ltd.

Wood from their own forests or forest they manage

Gunns Ltd owns 188,686 hectares of native forest and plantation and manage/lease 61,230 hectares of native forest and plantation on public and private land. There are 111,117 hectares of plantation under Gunns Ltd management and 70,495 hectares of native forest.

Instead of exporting this pulpwood Gunns Ltd want to use it in their own mill.

Gunns Ltd have stated they will establish a plantation estate of hardwood and softwood of 150,000 hectares. When all established this plantation area could supply 3 to 4 million GMt, assuming an annual growth rate of 20 to 26 cubic metres per hectares per annum.

Wood from other private forests

Private Forests Tasmania has prepared an inventory of the private forest estate, native forest and plantation and predicted wood flows. In the period 2007-11 some 1.8 million GMt is available and between 1.6 and 1.7 million GMt in the following two five-year periods to 2021. This estimate excludes wood flows from forest owned or managed by Gunns Ltd.

Much of the pulpwood currently harvested from private forest is exported. Wood from private property could be redirected to the proposed pulp mill.

Wood from State forest

Forestry Tasmania produces wood suitable for the pulp mill from harvesting to produce 300,000 cubic metres of sawlog each year. This wood is part of the volume of woodchip exported each year by Gunns Ltd and may be redirected to the proposed pulp mill.

Wood from saw mills

Each year some 350,000 tonnes of saw mill residue is produced. This material is currently exported and could be redirected to the proposed mill.

Peter Taylor, Regional Private Forester, South East

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