

**Forest technology centre**  
— open for business at Grafton

**Hi-tech system manages wood flow**

**The science of growing better forests**

**Making forest maps**



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## from the chief executive

The past decade has seen a major transformation of the timber industry in New South Wales.

Regional Forest Agreements and new long-term supply contracts have given the native hardwood sector the confidence to invest in new value-adding mills and state-of-the-art harvesting systems. The softwood sector has invested \$1.5 billion in world-scale sawmills and pulp and paper plants to process the output of the state's pine plantations.

As the steward of the bulk of the state's valuable forest resource, Forests NSW is committed to keeping pace with industry. This issue of *Bush Telegraph* focuses on how we and our customers are using innovative technologies to manage and obtain optimum value from the state's production forests.

On page 12, you can read about our GIS systems using advanced information technology to develop maps, harvest plans and other information essential for efficient forest management. On page 14 we cover the application of a new hi-tech wood flow modelling system that is delivering great benefits to both Forests NSW and our softwood customers on the NSW south west slopes. This system has just won a gold award in the Premier's Public Sector Awards.

On page 9, we profile Kerry Pidcock of Big River Timbers. Keeping an eye on the future has allowed Kerry and his team to build an international export business. Forests NSW, too, is keeping an eye on the future with the establishment of the Forest Technology Centre at Grafton to develop new hybrids and strains of commercially suited eucalypts to ensure top quality plantation timbers for industry into the future. See page 10.

Capturing the vast changes in Australian forestry over the past decade is a challenging task. Forests NSW is pleased to be a leading supporter of a new book *In the Living Forest* which should go some way to meeting this challenge. See the

back page for a special readers' offer.

I hope you enjoy this issue.



Peter Duncan  
Chief Executive



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**Cover photograph** Radiata pine seedlings at a Forests NSW Nursery. Forecasting where pine sawlogs will grow and go has been made easier with a new hi-tech wood flow modelling system. See page 14 for story.

Photo by Michael Wee/Forests NSW Image Library

## *In the Living Forest* published

A new book that will make a valuable contribution toward informed public debate about forest management in Australia has been launched by the New South Wales Minister for Primary Industries, Ian Macdonald.

The publishing of *In the Living Forest* has been supported by key players in forestry and related industries around Australia, with Forests NSW as a leading supporter.

Forests NSW chief executive, Peter Duncan, said the organisation was thrilled to support the publication, which is seen as a timely portrayal of forest management in twenty-first-century Australia.

"In recent decades the forestry sector has been undergoing a transformation into a vibrant modern industry committed to innovation, world class efficiency and achieving the scale of production essential for success in globalised markets," Peter said. "This book gives an insight into these changes."

Peter said Australians justifiably expect their forest products to be derived from sustainably managed native forests and plantations.

"Communities rely on professional forest managers to conserve unique forest ecosystems and lead the development of new forest-based products and services to help address global environmental concerns," Peter said.

Editor-in-chief, John Keeney, said *In the Living Forest* was designed as an independent review of the many strands of activity and thought which make up the forest community in Australia.

"Since European settlement our vision of the forests has evolved from that of wilderness, to resource, to national treasure to be managed with care," John said.

"Government policy, management expertise and forest science have evolved steadily with invention, entrepreneurialism and with great clamour. Lessons learned here should provide some useful models and thinking for other nations."

The book contains contributions from some of Australia's foremost experts including Professor Michael Archer, Eric Rolls, Phil Ruthven, John Williams, Tim Treadgold and Mark Kestigan.

"This has allowed us to balance the differing views with a realistic appraisal of economics, jobs, and the processes of transition," John said.

Copies of the book can be purchased from Forests NSW Information Centre on Ph: 1300 655 687 or (02) 9871 3377.

– Leah Flint Communications, Maitland

*In the Living Forest* will make a valuable contribution toward informed public debate about the management of Australia's forests



## Forests NSW designs state-of-the-art watch tower

A new \$160 000 watch tower designed by Forests NSW civil engineers is regarded as one of the most modern in Australia.

Located 80 kilometres from Sydney at Avon Dam, the 15 metre high tower has a view of two-thirds of the Sydney basin and went into operation for the official start of the bushfire season on 1 October.

Built for the Sydney Catchment Authority, the tower will be used to spot fires, as well as monitor potential flood and earthquake activity.

Early detection of fire is essential if the Sydney Catchment Authority is to safeguard drinking-water supplies for the city and Illawarra.

Forests NSW manager of engineering services, Nick Ryan, came up with the state-of-the-art design to meet current Australian standards.

"A lot of previous watch tower constructions required intensive on-site labour," he said.

"We preferred a simple, symmetrical, modular design that could be constructed in a workshop with the design easily adjusted for different sized towers."

"I climbed up the tower and felt very pleased with the end result. It is a great low maintenance long-term structure that, due to the simplicity of design, was quick and easy to construct."

Forests NSW have designed a number of towers for external clients including Australian Capital Territory Emergency Services.

– Sarah Chester Public Affairs & Media, Albury

This new watch tower near Sydney is ready for action thanks to the innovative, modular design created by Forests NSW civil engineers. *Photo courtesy Nick Ryan*

## Lifetime commitment to perfection

"Every person who knew my brother would understand his ever-present drive for perfection, quality and honesty in everything he did." So said Spiro Notaras at the funeral of his brother Lambrinos (Brinos) John Notaras, who was killed in a car accident near Coffs Harbour in September 2005.

Brinos was 75.

Their father, Jack, bought a sawmill at Lawrence near Grafton in 1951, and there began what has become a famous trademark in the Clarence Valley, J. Notaras & Sons.

Minister for Primary Industries, Ian Macdonald, acknowledged Brinos as a leader in his field at a local, state and national level.

"His dedication and achievements in his tireless work for over 50 years made J. Notaras & Sons one of the New South Wales timber industry's greatest success stories," Mr Macdonald said.

The State member for Clarence, Steve Cansdell, in a parliamentary tribute to Brinos, said he was driven by the pursuit of perfection in everything he did.

"That pursuit required continual development of new business, products and processes," Mr Cansdell said. "He carried out everything with an unrelenting commitment to quality and honesty, and with loyalty to everyone with whom he dealt."



Brinos was committed to meeting the demands of export customers, actively exploring opportunities for spotted gum in countries like Japan for boardwalks and plantation flooded gum for engineered flooring in Sweden.

Today, J. Notaras & Sons remains an industry leader in value-adding hardwood production, thanks to Brinos' legacy of investing time and research into maximising the value of smaller hardwood logs and plantation timbers and anticipating the need to prepare for this future resource.

– Howard Spencer  
Public Affairs & Media, Coffs Harbour

Above: Timber industry leader Brinos Notaras (far left), pictured in 2004 with brother Spiro Notaras, Russ Ainley of the Forest Products Association and Forests NSW chief executive, Peter Duncan.  
Photo by Howard Spencer

Top right and below: Kylie Durant shows the impact of the rust fungus on the European blackberry. The rust is being trialled in State forests and other areas around Tumut and Tumbarumba. Photos by Sarah Chester



## Control of blackberry focus of new biological trial

One of Australia's worst weeds, blackberry, is being targeted in a trial biological control program near Tumbarumba and Tumut in southern New South Wales.

Blackberry can thrive in a wide range of conditions, quickly invading and dominating river banks, bushland, plantations and farming land.

The trial to assess the effectiveness of new 'rust' strains in controlling blackberry has been undertaken by CSIRO with the financial support of the Riverina Highlands Weeds Working Group, of which Forests NSW is a member.

Secretary of the working group, Kylie Durant, said the 'rust' was a type of fungus, *Phragmidium violaceum*.

"Earlier fungal strains were released in the 1980s, with variable results due to resistance of some of the blackberries to the strains, and unfavourable environmental conditions," she said.

There are at least 15 different varieties of European blackberry in Australia.

Kylie said the CSIRO laboratory in France had established a garden of Australian blackberry genotypes to 'trap' new strains of the rust that specifically infect them.

This resulted in eight new strains being imported and tested for host-specificity in a high-security containment facility in 2002, with the new strains approved for release in February 2004.

CSIRO then conducted seven releases at trial sites across the region, including some sites on State forests.

"DNA samples from the trial sites have been collected and work is continuing on developing techniques to differentiate the new European strains from the existing populations of the rust, and to assess effectiveness," Kylie said.

"The next step is to continue to improve the efficiency of the methods to mass-produce the rust and develop a delivery system for future large-scale releases, as well as continuing to monitor the trial sites."

– Sarah Chester  
Public Affairs & Media, Albury



# Field guide to south coast forests released

Those wanting to identify a wide variety of native plants, animals and cultural heritage values on the south coast of New South Wales now have a handy new source of reference.

A new field guide to the region's forest flora, fauna and heritage features has been compiled by Forests NSW foresters and ecologists.

Field guide project coordinator and inventory forester, Mandy Flaxman, said the full colour guide has been developed to assist staff in operational forest management.

"The guide will allow people to identify features such as forest associations and threatened flora and fauna species, through to cultural heritage sites," Mandy

said. "It will be a key tool for our staff to implement environmentally sustainable forest management.

"The document can be used for training purposes where the primary objective is to familiarise staff with the identification of forest features of management significance."

Mandy said the south coast guide was the third guide of its type developed by Forests NSW as part of its Native Forest Management System, with field guides already available for the far south coast and north east forests.

"This guide covers the State forests extending from Moss Vale to Bermagui, and west to Cooma and Queanbeyan," she said.

"The information it contains will be of interest to a range of people, including other natural resource management organisations and members of the public."

Copies of the *Field Guide to Flora, Fauna and Heritage Features on the South Coast of NSW* are available at a cost of \$30.00 from Forests NSW Batemans Bay office on Ph: (02) 4472 6211.

– Leah Flint

Communications, Maitland



Above: A new field guide published by Forests NSW will assist staff and other interested people to identify the native plants, animals and cultural heritage features of New South Wales south coast forests. Photo Forests NSW Image Library



Above: Forests NSW operations supervisor, Peter Norris, laying fox baits as part of a joint annual fox baiting program being conducted by the Riverina Rural Lands Protection Board. Photo by Mick Lalor

## Outfoxing the fox

A joint annual fox baiting program being conducted by the Riverina Rural Lands Protection Board (RLPB), Forests NSW and the Riverina farming community aims to massively reduce fox numbers in the region.

Run in August and September, the program involved approximately 2,000 Riverina landholders laying poison baits from Tocumwal to Balranald.

Riverina RLPB district veterinarian, Dan Salmon, said the program had proved to be very successful with both the number of participants and enthusiasm rapidly growing.

"Foxes are a serious threat to livestock production through lamb predation, disease spread and, to a lesser extent, predation of new born calves," Dan said.

"We also consider them to be one of the worst environmental vandals in the area taking a tremendous toll on ground-nesting birds, small native mammals and reptiles.

"The joint program, now in its fourth year, has been tremendously well-supported by the farmers in the region. This year (including the baits laid by Forests NSW) we put out over 8,500 baits.

"We have had positive feedback from participants indicating an increase in lamb marking percentages, particularly the survival of twin lambs despite a tough year, and an increase in ground-nesting birds."

Forests NSW operations forester at Deniliquin, Mick Lalor, said foxes were the main predator of the brush-tailed phascogale as well as other ground-dwelling native animals.

"The program will drastically reduce the numbers of predators of this small carnivorous mammal that live predominantly in box woodlands within the area," he said.

Mick said Forests NSW would be taking special precautions, such as burying baits, to avoid non-target species that inhabit State forests.

"Foxes are drawn to disturbed earth and in doing so uncover the toxic baits," he said.

– Sarah Chester Public Affairs & Media, Albury

## Aboriginal cultural awareness program leads the way

Sometimes the simple piece of string Forests NSW's Aboriginal cultural heritage officer, Jeremy Saunders, uses as a prop in his lectures reduces participants to tears.

It is not so much the string, but the complex family and tribal ties that it represents to the Aboriginal community that evokes the response.

The tears well up when Jeremy cuts the string into tiny pieces to show how abrupt and final was the effect of government policy in the past of removing children from Aboriginal parents, or even whole communities from the areas that meant so much to them.

Forests NSW's Aboriginal cultural heritage training program has gained such credibility that it is now being sought by a number of other state agencies, including the Department of Corrective Services and the NSW Police.

"Many of the people that these two services come into contact with are Aboriginal, and this course gives them some insight into what it means to be an Aboriginal person in today's world," said Jeremy.

Jeremy's explanation of the traditional family life of grandparents, aunts, uncles and elders having a role in family and community life gives some insights into the behavior of young Aboriginal people today.

The course also explains what can happen when young Aboriginal people are separated from those influences by the breakdown of communities.

Jeremy and fellow Forests NSW Aboriginal cultural heritage officer, Kevin Smith, have just completed a series of eight courses delivered to the staff of the new Mid North Coast Corrective Services Centre at Kempsey and to local police officers from the Kempsey/Port Macquarie area.

The courses were funded by the NSW Premier's Department.

– Howard Spencer Public Affairs & Media, Coffs Harbour



Above: The team that made the Aboriginal cultural awareness course at Kempsey happen: (from left), Forests NSW Aboriginal cultural heritage officer, Kevin Smith, of Kempsey; forester Mick Wilson of Wauchope; Aboriginal elder Harold Smith of Kempsey; Aboriginal cultural heritage officer, Jeremy Saunders, of Taree; NSW Premier's Department representative, Angela Anderson, of Coffs Harbour; Aboriginal elder William Little of Bellbrook; and Mid North Coast Correctional Centre general manager, Bruce Mercer. Photo by Howard Spencer



## Cypress sculpture placed near ocean

Emerging Sydney sculptor Denise Hume needed the help of "a few good men" to create and install her work as part of this year's 'Sculpture by the Sea'.

And she got them in spades: from Forests NSW chief executive Peter Duncan; to Barradine forester Tom Newby in the Pilliga State Forests; to cypress timber cutter Ted Hayman; to truckdrivers; and a few strong men to carry the bundles of timber into place on the cliff tops near Bondi.

Denise's evocative and thought provoking sculpture, entitled 'Refuge', was inspired by her despair at the plight of the children of refugees.

"I hated seeing young children growing up behind bars when they had done nothing but have parents who wanted a better life," Denise said.

In her third year at Sydney College of the Arts, Denise settled on wood as a medium of choice after working with raku ceramics, resins, wax and fabric.

"The sculpture installation was of 100 bundles of seven or eight cypress poles lashed together, with sharpened points towards the sky."

And they were not just any old scraps of timber. The cypress pine poles are thinnings from Cumbil State Forest in the Pilliga, where they grew as saplings in the 1890s.

Because they grew so thickly they 'locked up' and remained as thin poles about 10cm in diameter and two to three metres tall.

Forests NSW supported Denise through the donation of the timber for her piece.

'Sculpture by the Sea' has been running since 1997, and has grown from 30 sculptors to 110 exhibiting this year. Hundreds of thousands of people walk the cliff top walk between Tamarama and Bondi to enjoy the free exhibition of contemporary sculpture each year in November.

Denise Hume won a \$5000 award for the sculpture and was named in the top five artists by the Director of the NSW Art Gallery. To find out more about the event see: [www.sculpturebythesea.com](http://www.sculpturebythesea.com)

– Howard Spencer  
Public Affairs & Media, Coffs Harbour

Top: Sydney sculptor Denise Hume created a thought provoking installation for 'Sculpture by the Sea' using cypress timber donated by Forests NSW. Photo by Stefan Smith

## International forestry exhibit staged



For the first time in the Southern Hemisphere, Australia had the honour of hosting the 22nd International Union of Forest Research Organisation's (IUFRO) World Congress in Brisbane during August 2005.

Held every five years, 'Forests in the Balance: Linking Tradition and Technology' was the theme of the event that attracted 2,100 delegates from 96 countries – including 12 delegates selected from Forests NSW.

In addition to providing staff and financial assistance for the congress, Forests NSW had the privilege of displaying within the trade exhibition over three days during the event.

"We developed our stand to inform delegates of Forests NSW's leading-edge work in carbon trading, sustainability reporting and tree improvement research," NSW Department of Primary Industries events

manager, Susie Kable, said.

"A lot of attention was given to the area of the display focusing on Forests NSW's world's first sale of carbon credits through an approved greenhouse gas emission-trading scheme, which occurred in early 2005."

The atmosphere within the trade exhibition was bustling during the breaks between the busy congress program, with delegates taking the chance to visit Forests NSW's stand and those of other forestry departments.

International delegates also took the opportunity to acquire publications and subscribe to the *Bush Telegraph*.

– Kylie Davies  
Communications, Sydney

Left to right: Forests NSW chief executive, Peter Duncan, with the Chairman of the IUFRO Congress Organising Committee, Dr Gary Bacon, and Forests NSW manager of harvest regulation, Kris Gounder. Photo by Kylie Davies

## Rubbish researcher an awards' finalist

Forest resources researcher, Fabiano Ximenes, was thrilled to be named a finalist in the recent 2005 'Fresh Science' awards. The national awards encourage young scientists to promote science to the broader public, increasing community awareness and understanding of new research.

For the past five years Fabiano has been working with fellow researcher David Gardner to determine how long carbon remains stored in wood and paper products.

"It is estimated that some 4.5 million tonnes of wood and paper products go into Australian landfills each year," Fabiano said. "Internationally, it is assumed that 20 to 25 per cent of the total weight of these products is released as the greenhouse gases methane and carbon dioxide.

"On that assumption, 1.5 per cent of Australia's greenhouse gas emissions have been estimated to come from the decomposition of these products."

Fabiano and David's research aimed to test the decomposition assumptions by digging up old rubbish tips, recovering wood and paper products that had been buried for up to 46 years and analysing the wood products in a laboratory.

"Once in the lab, we found that only 1.4 to 3.5 per cent of the original carbon in the wood products had been lost through decomposition," Fabiano said.

He said that their work showed that Australia's greenhouse gas emissions are lower than previously thought and demonstrate that timber is a greenhouse-friendly product.

As an awards' finalist, Fabiano gave presentations to students and attended media

conferences – including a radio interview with BBC London.

"It was a great experience and will encourage me to continue to lift the profile of science in the community," he said.

– Leah Flint Communications, Maitland



Above: Forest resources researcher Fabiano Ximenes was a finalist in the national 'Fresh Science' awards. He's pictured at work digging up wood products from landfill. Photo courtesy Fabiano Ximenes

## Red gum violap attracts attention

James Thompson grew up among the red gum forests and timber workers at Deniliquin in south-west New South Wales.

His father, Forests NSW Riverina regional manager, Mike Thompson, said this background gave James an appreciation of sustainably-managed forests and the fine qualities of red gum timber.

James now lives in Perth and works as a blues singer, songwriter and performer.

Mike said James' fondness of red gum timber was revealed when he needed a new instrument, a lap-slide-style guitar known as a violap.

Problems arose when James asked luthiers (guitar builders) about building an acoustic lap guitar out of red gum.

Traditionally, this type of guitar is built out of *Acacia koa* or *Acacia melanoxylon*. Red gum isn't as stable as the proven tone woods, ruling out its use in acoustic guitars.

However, Mike said after discussions with expert red gum furniture builder Glen Gray, from Barham in NSW, the decision was made to go ahead with an electric instrument instead of an acoustic.

Talks followed with Brad Clark, CEO of Cole Clark guitars in Melbourne, and James was encouraged to hear Cole Clark was already using red gum.

"Cole Clark quickly set James up with a stunning violap model instrument made of very high quality red gum with some spectacular fiddle back grain on the neck and fingerboard," Mike said.

The violap was featured at the launch of James' CD in Melbourne earlier this year and at various concerts in Perth, Brisbane, Melbourne and Deniliquin.

"The violap always attracts interests at my shows and as far as I know it is the only lap guitar made from sustainably-managed red gum," James said proudly.



Top: Growing up near the red gum forests of the Riverina gave musician James Thompson an appreciation of the fine timber. *Photo Forests NSW Image Library*

Above: The violap on a high-quality red gum table made by Glen Gray Furniture. *Photo by James Thompson*

– Sarah Chester Public Affairs & Media, Albury



## Sweet nectar tests the limits

Research ecologists from the NSW Department of Primary Industries (NSW DPI) have literally travelled skywards to find out how much nectar two species of gum trees produce.

In a project being conducted for the honey industry, the researchers used cherry pickers and cranes to reach the blossoms in the canopies of 30 metre tall spotted gums and grey ironbarks in Nowra, Currumbene and Termeil State Forests on NSW south coast.

Nectar production is highly variable in eucalypts, with the scientists examining how nectar production from these two species is affected by tree size, forest age and timber harvesting.

To date, very few studies have been done on nectar from trees because of the difficulty in getting access to flowers at the top of tall trees.

NSW DPI senior research scientist, Dr Brad Law, says the research aims to improve understanding of how nectar production is affected once a forest is harvested for timber.

"We will be making recommendations to ensure that there continues to be a supply of nectar for the honey industry as well as the diverse native wildlife that feed on nectar," Brad said.

"The aim is to ensure that honey production and logging work hand in hand."

The samples collected are now being analysed, with a final report expected by mid-2006. The research has been funded by the Rural Industries Research and Development Corporation.

– Joanne Finlay Public Affairs & Media, Orange



Middle: A spotted gum blossom. Left: Researchers using a cherry picker to access nectar in eucalypt blossoms 30 metres from the ground in a south coast State forest. *Photos by Brad Law*

# Innovation

## THE SECRET TO MILL'S SUCCESS

Climbing back from the brink of disaster has been an experience that has steeled Big River Timbers' managing director of the past 25 years, Kerry Pidcock. Now preparing for his retirement, Kerry reflects on the changes and successes his company has experienced over the years.

He had not long been in the chair when the government took steps in the early 1980s to protect rainforest, which ended the harvesting of brushwood timbers. Such timbers had sustained the Pidcock family's north coast mills for three generations.

"This was going to be death by not a thousand cuts, but by two dozen cuts," Kerry said. "Basically, it wrecked the business."

The company had been peeling brushwood veneer to sell to plywood manufacturers, but the rainforest decision ended that and many small veneer operations closed down.

"I said to our board that it was time we began to make our own plywood, and approached the then Forestry Commission of NSW to find an alternative supply of timber," Kerry said.

The solution was eucalypt timbers from regrowth forests and a small amount of hardwood plantation timber.

"We made our first sheet of formply in August 1983," Kerry said. "That was a razor edge decision. There was no assurance that we would succeed, and many plywood operators went belly up.

"When I look back on it now it was a time of total torment."

But the new product was a success.

Over the next 20 years, Big River Timbers became a multi-million dollar business supplying formply and value-adding with specialty ply flooring and face timbers that have carved a unique niche in the Australian building industry.

Big River Timbers also established distribution centres in Sydney, Brisbane, Melbourne, Perth and Townsville.

"We now have Australia-wide coverage to sell our own products and other products as well," Kerry said.

"But when we started out we set ourselves a budget of making just 70 sheets of ply a day."

It is now 3,500 sheets a day and it is found all over the world.

When a new bridge was built over the Panama Canal, Big River Timbers formply held it together.

Across Asia, eucalypt formply is used time and again, typically between 60 and 100 times, compared with local Asian products used and reused only three to six times.

"The eucalyptus product is tough," Kerry said. "For the Australian market we have been able to make it lighter as well, by including some softwood under the face ply."

Another thought in the back of Kerry's mind has been the understanding that log sizes would grow smaller over time as regrowth forest and plantation timbers became increasingly used.

So Big River Timbers kept ahead of the game by installing a lathe system that will peel smaller log diameters.

On-site engineers devised a roller system to support the smaller diameter logs, resulting in a peeling process that leaves barely a broom stick at the end.

Kerry Pidcock has also kept an eye on the changing forest policy landscape to ensure there continues to be a future for his operation.

Top: Managing director of Big River Timbers, Kerry Pidcock, is retiring after 25 years heading-up the business. *Photo by Howard Spencer.*

Left: Blackbutt plantation on the north coast of NSW. Forests NSW hardwood plantations now supply speciality timbers to a growing domestic and international market. *Photo Forests NSW Image Library*



"We are satisfied with the current arrangement and a 20-year wood supply agreement," Kerry said.

"We are now negotiating on the specifications for veneer grade logs out of hardwood plantations, and there is more than ample veneer grade timber in the regrowth forests.

"If you see trucks coming into the mill now they are loaded with stem after stem of beautifully even logs, which suit our operation. This is unlike the loads of years ago when there might be two or three giants on a truck, only suitable for sawing off big boards."

So what does the future hold for Kerry now that he is in the process of handing over the running of the business?

"The company has grown and expanded significantly over the years and is now in a profitable position," Kerry says.

So much so that he is planning a fishing trip to the Kimberley, and there is always the possibility of another trip to Japan to see one of his sons who lives there.

Howard Spencer  
Public Affairs & Media, Coffs Harbour



# Cutting-edge forest technology at Grafton

The new Grafton Forest Technology Centre was officially opened on 4 August 2005 by the director-general of the NSW Department of Primary Industries, Barry Buffier.

Home to cutting-edge technology and research for forestry and agricultural industries, the facility incorporates two main functions. The first sees Forests NSW tree improvement staff working on a number of control breeding varieties using species from Australia and some strains of eucalypts that have been grown successfully overseas.

Secondly, the centre concentrates various aspects of Forests NSWs operational and strategic facilities on the site of the former Agricultural Research Station (established in 1902), now named the Department of Primary Industries Grafton Centre of Excellence.

The Centre is located 15 kilometres north west of Grafton, which is a strategic location for the hardwood and softwood plantations of the NSW far north coast and tablelands.

As well as being home to the tree improvement staff, the technology centre is now host to Forests NSW plantation management staff for northern NSW.

The 785 hectare site provides space for hardwood and softwood plantations and associated buildings.

"We manage all the softwood and post-1994 hardwood plantation activities north of Walcha," says acting Northern regional manager, Kevin McGrath.

"This also includes firefighting activities north of the Clarence River and in the northern tablelands."

Grafton-based staff pay particular attention to protecting the valuable plantation assets, which are fire intolerant, especially in their earlier years.

Grafton continues to be the hub for Forests NSW carbon accounting

efforts, with manager Penny Baalman and carbon accounting officer Dr Nick O'Brien making great strides in trading NSW Greenhouse Abatement Certificates.

Private forestry officer, Murray Wood, is also on site to source private property timber sales and assist in the purchase of suitable land for plantations establishment or timber harvesting.

The management of the areas's native State forests is covered by forester Pauline Stewart, who oversees harvesting operations in the Grafton and Clarence region.

The new technology centre will see the establishment of eight hectares of clonal seed orchards.

"We have a budget of more than \$700,000 for the establishment of specialised clonal propagation and breeding facilities within the hardwood tree improvement program," said Forests NSW manager of tree improvement, Michael Henson.

"We will also be establishing 489 hectares of hardwood and softwood plantations on the site.

"This facility will allow us to centralise nursery operations, tree improvement and plantation establishment."

Already, Forests NSW seed centre at Grafton is offering quality tree seed, with known origin and pedigree, for plantation establishment.

A Forests NSW nursery has been operating from the site for a number of years, and supplies seedlings for

softwood and hardwood plantings across the north of the state.

"Our seed centre inventory of improved seed is supported by more than 40 years of eucalypt tree improvement research," Michael said.

"We have established clonal seed orchards for key eucalypt species, including *Eucalyptus dunnii*, *E. nitens*, *E. pilularis* and *Corymbia citriodora subsp variegata*.

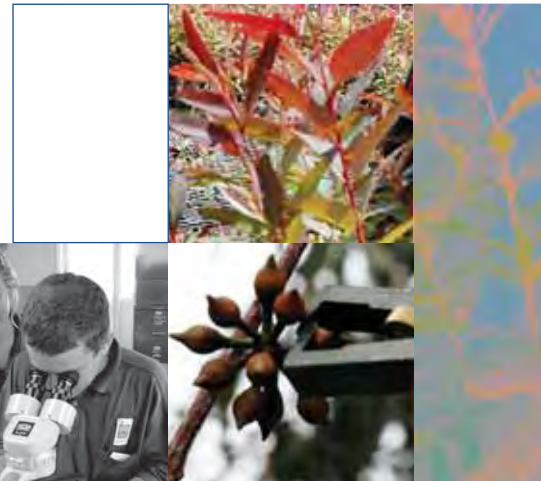
"Forests NSW also manages seed orchards for a range of commercial and boutique eucalyptus species.

"We can produce elite pure species of hybrid seed to order from a range of superior trees selected from our pedigreed trials that cover more than 25 eucalyptus species."

To inquire about the seed available, contact the centre by email at [seeds@sf.nsw.gov.au](mailto:seeds@sf.nsw.gov.au)

– Howard Spencer

Public Affairs & Media, Coffs Harbour



Above: Forests NSW tree improvement program technical officer, Chris Moran, uses a microscope to examine seeds which will be planted at the Grafton Forest Technology Centre. Photos by Howard Spencer



elite  
species



Forests NSW tree improvement program manager Michael Henson, right, explains propagation methods to timber industry representatives at the Grafton Forest Technology Centre

### Forests NSW tree improvement

staff at the Grafton Forest Technology Centre hope to produce commercial quantities of clonal seedlings by 2010, after beginning operations last year.

"We are producing hybrids and pure species that might be more suited to extend the planting range of our main commercial species," says Forests NSW manager of tree improvement, Michael Henson.

"The program will also produce hybrids more suited to marginal sites in NSW and to improve other traits in our main species."

This work is in the hands of Forests NSW tree breeding and propagation research officer, Helen Smith.

"The program is crossing a number of key species with other species that can impart useful traits. An example is red mahogany with *Eucalyptus grandis* (flooded gum or rose gum)," Helen said.

"This will give us the vigour of flooded gum with the wood quality of red mahogany.

"It should also improve the colour, and give more stability than flooded gum alone."

The technology centre will also be crossing elite material of some species to get better material of the pure species to select as clones.

"We hope to extend the range of our best blackbutt species by crossing them with stringybark to achieve frost tolerance and to grow on heavier soils," Michael said.

"This is taking place at Grafton on potted select grafted plants.

"The centre will also be home to clonal seed orchards, and ultimately all the work will be done on site in our pot-based breeding arboretum which will be part of the new research facilities at Grafton."

### Forests NSW plantations of the far north coast and tablelands

#### Major areas of plantations in the localities of:

- Whiporie – Rappville
- Walcha – Nundle
- Urbenville
- Bonalbo – Pikapene

#### Current Estate Size

##### Softwood

State forest – 21,740 ha  
 Joint venture – 2,399 ha  
 Total 24,139 ha

##### Hardwood

State forest – 13,450 ha  
 Joint venture – 270 ha  
 Joint venture Land Rental Annuity – 6,802 ha  
 Total – 25,522 ha

#### Main softwood species

*Pinus radiata*, F1 and F2 Hybrids of *P.elliottii* x *P.carribaea*, *Pinus elliottii*, *P.taeda*, *P.carribaea*, *Araucaria cunninghami* (Hoop Pine), *Araucaria bidwillii* (Bunya Pine)

#### Main hardwood species

*Eucalyptus dunnii*, *Eucalyptus pilularis*, *Corymbia maculata*, *Corymbia variegata*, *Eucalyptus grandis*, *Eucalyptus cloeziana*, *Eucalyptus nitens*, *Eucalyptus saligna*.

Growth rates are dependant on site but vary between the Mean Annual Increment of 10-22 m<sup>3</sup>/ha/yr for both softwood and hardwood.

#### Major investors

ST Microelectronics, Tokyo Electric Power Company (TEPCO), Rothschilds



Above left: Technical officer, Warren Varley, uses pliers that he has adapted to speed up the pollination process on selected trees in nurseries operated by the tree improvement program. Photos by Howard Spencer



Field worker, Jess Scott, with grafted seedlings in the Grafton Forests NSW nursery. Photos by Howard Spencer



FORESTS NSW IMAGE LIBRARY

# Making maps of forests

Timber has been harvested from New South Wales forests since the arrival of Europeans more than 200 years ago. When the first State forests were declared by the government in the early 1900s, maps were beautifully crafted by hand to show forest inspectors and loggers the location of the best timbers. Today, maps of State forests are complex and detailed, generated using the latest in information technology by highly-skilled professionals for a variety of applications. Leah Flint reports.

While the cartographers of the past used pastels and crayons to illustrate geographic features on maps, today's geographic information professionals spend time on a computer to accurately generate a visual overview of an area.



More commonly known as GIS analysts, these mapping specialists are a vital part of Forests NSW operations.

According to Forests NSW senior GIS analyst, Todd Walmsley, GIS is an acronym for geographical information systems and is essentially a way

to digitally capture, store, manage, display and analyse spatial (or geographic) information and associated non-spatial information.

"Geospatial information is features such as property boundaries, roads, rivers, soil types and forest types," Todd said. "Non-spatial information covers things such as who owns a road or its name."

Todd said GIS had a variety of applications in forest management.

"Our GIS system is used to generate a wide variety of geographic information, ranging from spatial analytical reports to 'graphic' views (such as recreational touring maps), through to maps for timber

harvesting to support operational business functions," he said.

"Another benefit is the linking of other various features to our stored geographic data," Todd said. "We have a lightning strike detection system that shows the exact point that lightning has struck – potentially starting a disastrous wildfire ignition if in a valuable pine plantation.

"The system pinpoints the strike on a map within five minutes and enables our trained firefighting staff to rapidly deploy and assess the fire situation."

Todd said that if a wildfire starts in or near a native forest or a plantation, GIS operators could use their mapping information combined with aerial reconnaissance of the fire to quickly create maps of the fire and fire boundaries to assist firefighters in their suppression efforts.

"This can mean some long nights during bushfire emergencies as we review the fire hot spots and fire edges from overnight aerial thermal imagery and generate maps showing the best options for fire-break placements, as was the case in major bushfires during the summers of 2001-2002 and 2002-2003," Todd said.

Each of the spatial data sets is known as a layer, or feature class, with the operators choosing to create a map from the relevant reference and operational datasets.

"Forest NSW has a comprehensive geospatial data library. We have layers showing the State forest estate and its boundaries;

layers showing the different forest types; layers showing contours; layers showing roads; layers showing water courses; and so much more," Todd said.

"This is all stored in a central repository, meaning that maps can be consistently generated by Forests NSW GIS staff across New South Wales."

In regional offices, GIS analysts and foresters support business operations to prepare maps for timber harvesting operations. The system is linked to recorded sightings or evidence of rare and threatened plants and animals. These can be pinpointed on the map with appropriate protection measures, such as an exclusion zone or modified harvesting practices, clearly shown.

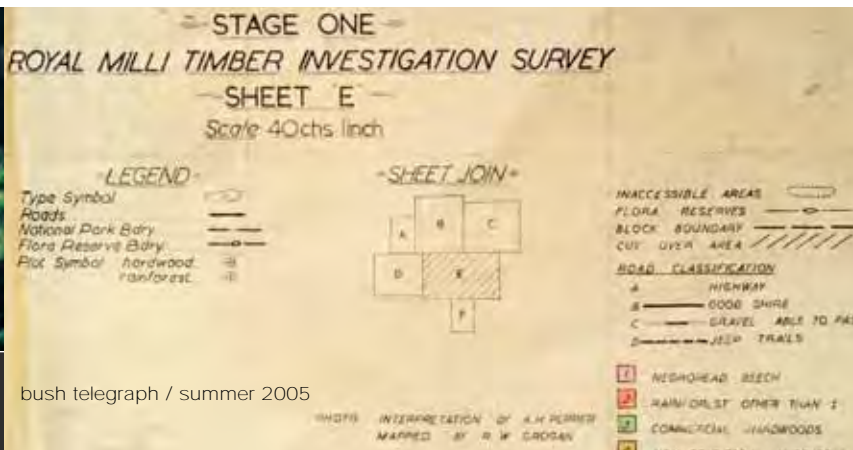
Todd said that GIS had many other applications, such as computing statistics on the area of different types of forest or lengths of forest roads, and in the storage of information on forest harvesting cycles and forest health information.

"This allows Forests NSW to efficiently report to government and community on a variety of areas, particularly in our documents such as the 'Seeing (or sustainability) Report'."

New and innovative applications are also being developed and assessed for use in operational forest management.

**Map**, n. A representation, on a flat surface, of a part or the whole of the earth's surface, the heavens, or a heavenly body  
2. A maplike representation of anything.

**Cartography**, n. The production of maps, including construction of projections, design, compilation, drafting and reproduction. (The Macquarie Dictionary)





FORESTS NSW IMAGE LIBRARY

"The use of remote sensing technologies is being explored," Todd said. "Trials are being conducted using plane-mounted lidar technology, where light is transmitted on to the forest and reflected back to the lidar instrument where it can be analysed."

"Different parts of the forests' structure reflect differently, allowing for all types of assessments of forest type and forest health through to the size of individual trees."

The use of three-dimensional modelling is also being reviewed, which allows the shapes of mountains and other geographical features to be better demonstrated.

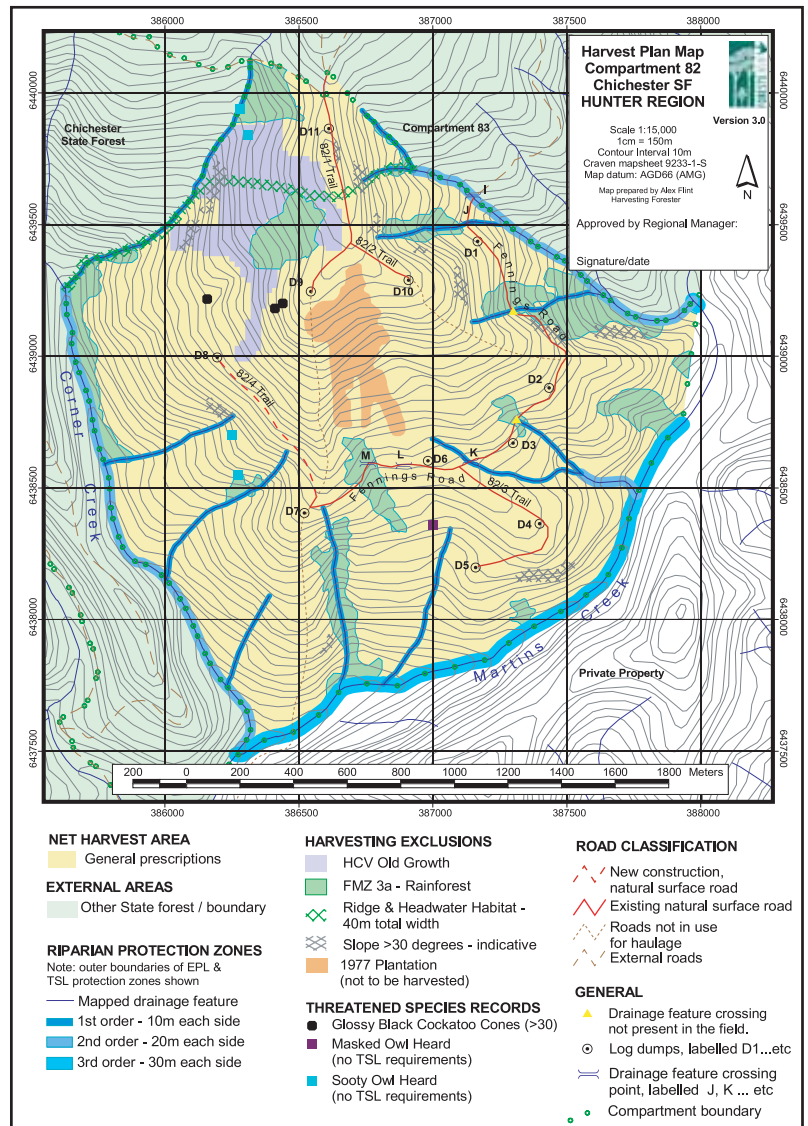
For the general community, the most visible benefit of Forests NSW's mapping technology is the Forest Map series.

"So far, the series covers the central, lower north, mid north and south coasts of NSW, in addition to the central west," Todd said.

"These are replacing maps printed in the 1970s and 1980s which would have taken one cartographer 12 to 18 months to produce. It now takes a single GIS analyst just three months to produce a map using the new technology."

Copies of Forest Maps can be purchased over the telephone from Forests NSW Information Centre on Ph: 1300 655 687 or (02) 9871 3377.

– Leah Flint  
Communications, Maitland



Far left: Forests NSW senior GIS analyst, Todd Walmsley, said the application of GIS technology is a vital part of Forests NSW operations. *Photo by Matt Nagel.* Above: Compartment maps covering, on average, 250 hectares are used to manage State forests for multiple uses and values. Below far left: Created around 35 years ago, this hand coloured map covering roughly the same area of forest as the modern one, is testimony to major advances in mapping technology. *Photo by David Barnes.* Below: Aerial view of Nadgee State Forest near Eden. *Photo Forests NSW Image Library*



An integrated system of management that sees Forests NSW staff using the latest in computer software technology is delivering big benefits for both forest managers and softwood sawmill customers on the New South Wales south-west slopes.

Acting manager of Forests NSW Resources, Mike Welch, said the integrated wood flow planning system is using the latest technology to forecast where wood is going to grow, and where it will be transported, from pine plantations around Tumut, Tumbarumba and Batlow.

"This improves our long-term forest management by ensuring the best trees are harvested at the right time," Mike said. "If we get it wrong it takes 30 years to re-grow a tree."

"The new system allows Forest NSW to maximise revenue and at the same time provide our customers with the sawlogs to maximise their revenue, a win-win situation for all."

Mike said Forests NSW was pleased with how well the system is working.

"It has reduced uncertainty in wood flow management and operational planning, which saves time and also allows more effective management of our road network and heavy machinery."

"This has all come about during the past year following the introduction of 'Spatial Woodstock', a computer system using geographic information systems (GIS).

"The system shows exactly where trees with the correct amount of sawlog are located on a map of the forest. This forms the basis of operational plans to deliver wood to the mills."

The system is being phased into other Forests NSW regions across the state.

Mike said Spatial Woodstock, developed by Canadian company REMSOFT, was highly regarded by the forestry industry.



## Hi-tech system improves wood flow planning

"It's an excellent tool that has positioned Forests NSW at the forefront of technology to manage timber production and delivery to its customers," he said.

Approximately two thirds of Forests NSW's business is now on a 'delivered-sales' basis, whereby the organisation is responsible for growing, harvesting and hauling wood right to the mill door.

Spatial Woodstock is a system which combines the skills of Forests NSW's GIS, planning and resources staff to ensure sawlogs delivered match the requirements of sawmill customers.

The system has mainly been used in softwoods, but Mike said he could see it being highly beneficial for long-term planning in native forests. It is already being used successfully by Forests NSW's Eden-based staff for even-aged regrowth native forests on the far south coast.

"We can see the system making a huge difference to the way we plan our wood flow and deliver our wood. We are even looking at introducing it into the management of red gum forests in the Rivierina and the cypress forests of the Pilliga."

"This system gives us the vision to plan not just over a five-year period but across a 50 to 200 year period the lifecycle of a forest."

"It has huge advantages from both an environmental and commercial point of view when it comes to sustainably managing our valuable forest resource," Mike said.



Top to bottom: A computer wood flow planning system is being used to determine where wood will grow and go. *Photos Forests NSW Image Library.* Forests NSW merchandising forester, Tijmen Klootwijk, in charge of Visy stumpage operations. *Photo by Roger Davies.* Seen discussing a supply plan: Forests NSW forest assistant, Kevin Todd; supervising forest officer, Dick Williams; Visy Pulp and Paper Mill forest operations coordinator, Rodney Anderson; and harvesting contractors from Shanbe Pty Ltd in Carabost State Forest. *Photo by Julie Lucato*

— Sarah Chester  
Public Affairs & Media, Albury

# Finding better ways to grow



## and manage our forests

Innovative, science-based outcomes for the forest industry are the focus of research efforts of the NSW Department of Primary Industries forest researchers. According to research leader, Robert Eldridge, research into the establishment, management and timber products of planted forests; biodiversity of managed forests; and the many potential benefits of returning trees to the rural landscape are current priorities.

"We have 30 scientists working with other staff on our key programs," Robert said. "Our research is in the streams of new forests, tree and plantation improvement, forest health and forest biodiversity."

Under the 'new forests' program, researchers are focused on quantifying the carbon sequestered in planted forests and also the carbon that remains stored after processing both native and planted forests, and in the resulting timber products.

ests could be used to generate commercial products and services beyond traditional timber products."

Robert said the 'plantation improvement' program aimed to develop management systems that meet international benchmarks for productivity and sustainability.

"Our work is focused on increasing the value of the timber coming from Forests NSW hardwood and softwood plantations," he said. "We are working with operational staff to develop robust and cost-effective practices for establishing and managing plantations to ensure the best possible resource for the timber industry."

A significant proportion of this work has seen researchers working with operational staff and sawmills to follow sawlogs from the plantation through the sawing process.

"We are developing methods for accurately predicting the quality of the sawn product from an assessment of the tree as it stands in the plantation or forest," Robert said.

Minimising the impacts of native and exotic pests and diseases in managed forests and improving detection and assessment efficiencies is the

focus for researchers in the 'forest health' program.

"The dollar value per hectare of eucalypt and pine plantation can be tens of thousands of dollars," Robert said. "There are a number of pests and diseases that can have an impact on the growth and timber quality of trees and the researchers in this program are focused on locating outbreaks and developing recommendations for the management of specific pests and diseases."

Maximising the biodiversity of both native and planted forests is the focus for researchers in the 'forest biodiversity' program.

"Researchers are focused on enhancing our understanding of forest ecosystems and also developing integrated models for wildlife habitat and timber production from State forests," Robert said.

"Individual researchers are looking at key forest species including birds, owls, bats, frogs, reptiles and arboreal mammals to assess the impacts of timber harvesting and other forest management operations," Robert said.

"This combined allows researchers to gather data to evaluate the methods currently used to assess forest biodiversity and present new models for assessing biodiversity in managed forests."

Robert said that being part of the NSW Department of Primary Industries' (NSW DPI) overall science and research program was bringing benefits for all.

"NSW DPI is the largest provider of science and research services within the NSW government, with scientists ranked in the top one per cent of world research institutions in agricultural science, and plant and animal science," he said.

"We will continue to develop a program that is both responsive to industry needs and to innovation by scientists."

For more information on the NSW Department of Primary Industries' science and research programs go to [www.nsw.dpi.nsw.gov.au](http://www.nsw.dpi.nsw.gov.au)

– Leah Flint  
Communications, Maitland



"The team is also assessing tree species and management systems for catchment protection and mine site rehabilitation," Robert said. "This work is already making a valuable contribution toward initiatives to address the impacts of salinity in rural New South Wales as we determine the best trees and the best locations to have an impact in low rainfall areas.

"Additionally, our researchers are looking at ways strategically located planted for-

Above: Thirty research scientists are focused on growing healthy and productive future forests. Photos Forests NSW Image Library

Compare the photos for each heading. What has changed?

1917 -  
Bullock team  
and hoop pine  
logs arriving  
at a sawmill in  
Casino NSW  
after a three day  
journey from  
the forest.



Transport

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A  
aboriginal  
handprints.  
All the needs of  
Aboriginal people  
were met by the land  
prior to European  
settlement.



Aboriginal traditions

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Cedar cutters  
camp in the  
forest, late  
1800s. Clothing  
was made from  
natural fibres  
such as cotton  
and wool.



Clothing

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# Forests: Then, Now

1911 - Wip,  
Herb, Stan,  
Tom and  
their mum.



Women

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Timber cutters in  
the early 1900s.  
Axemen used  
boards to climb  
and cut higher up  
a tree, avoiding  
the bad wood  
in the butt.



Technology

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1900s



Logging truck transporting Radiata pine logs to a sawmill near Tumut NSW.



Aboriginal cultural heritage officers work with the Aboriginal community to protect and learn from traditional sites.



This forester wears fire-retardant clothing and a hard hat while conducting a hazard reduction burn.

X



How will we transport logs in the future? Draw or write about some of your ideas.

# and Tomorrow



A forest research officer.



Harvester buncher can harvest multiple trees and cut them ready for transport.

2005

2200



## Expo celebrates five years of living with biodiversity

The Strickland Forest Expo, an annual event for upper primary students, is a little different to most environmental education activities.

The event puts students in the position of forest manager and asks them to put together a hypothetical management plan for Strickland State Forest. The plan must consider the many ways we use and conserve forests including managing threatened species of flora and fauna, recreation areas, timber, heritage sites and catchments.

Held each year during *Biodiversity Month*, September, and around *Threatened*

*Species Day* on September 7, the event introduces students to some of the complexities of ecologically-sustainable forest management. This year saw the expo complete its fifth consecutive year of success.

Classroom and web-based resources support participating teachers and students, making the event more than just a day out in the forest.

Teachers from Rumbalara Environmental Education Centre, Taronga Zoo Environmental Education Centre and Forests NSW work together to design, promote and present the event each year.

Over 2,300 students have been through the program over five years with many schools keen to involve their students each year.

For more information contact Forests NSW education officer, Gerard Nolan, on Ph: (02) 9871 0050.

– Carmen Perry  
Communications, Maitland

Top: Strickland State Forest is managed by Forests NSW to protect its special environmental and heritage values, providing unique opportunities for education and recreation. *Photo Forests NSW Image Library*

## Performance at Opera House for Riverina school

Donations from the timber industry have helped 20 students from Holbrook Public School make it to the Sydney Opera House to display their marimba talents.

Ausply at Wagga Wagga donated plywood and ITI Sawmills (now Hyne & Son) at Holbrook donated timber to help make the marimbas.

Hyne & Son also donated \$1,000 towards the expenses involved in the trip to Sydney.

The students have only recently learnt to play the marimbas, an African-style xylophone instrument, under the guidance of teacher, Di Bridges.

Holbrook Public School principal, Kerry Horsley, said the invitation to the Festival of Instrumental Music at the Opera House in August was a great honour and a fantastic experience for the students.

"After auditioning via video we were the only marimba group in the state chosen to perform. As we are only a small rural school with a fledgling music program we saw it as a huge achievement.

"It was an important lesson for everyone involved, as it showed what a small group in a small school can achieve with help from the local community, timber industry and a \$1,000 donation from Holbrook Rotary Club," she said.

As well as community contributions to the project, school general

assistant, John Hawkins, was responsible for the instruments' construction, and the students helped by painting them.

"They all feel a real ownership of the marimba band," Kerry said.

– Sarah Chester Public Affairs & Media, Albury



Students from Holbrook Public School gearing up for their marimba performance at the Opera House in August. *Photo by Kerry Horsley*

## Wollemi pines available from Forests NSW Nurseries from April

One of the world's most ancient and rare trees, the Wollemi pine, will be sold by Forests NSW Nurseries from April 2006.

Forests NSW retail nursery coordinator, Joanne Tyler, said staff were thrilled to be selected to retail the plants that descend from a remote and secret population of just 100 pines within the Wollemi National Park, west of Sydney.

"A conifer belonging to the Araucariaceae family, Wollemi pines are believed to be up to 200 million years old. It is often referred to as the 'Jurassic pine' as it is understood to have existed at the same time as the dinosaurs," Joanne said.

"The Wollemi pine will make an extremely unique feature tree for large gardens and parks, a perfect patio and indoor plant or a distinctive gift for special occasions," she said. "It is very attractive, versatile and hardy."

Joanne said the price of the plants will depend on its age and its relationship to the wild population.

"For example, small pines that have been propagated from second or third generation cuttings and are just a year old will be a lower price than the larger 1.5m to 3m trees ranging in age from three to seven years that are immediate descendants of the wild population," she said.

"The planting of Wollemi pine in gardens and parks throughout the world is an important step to help conserve this unique and endangered species."

To get hold of your own prehistoric tree in 2006, contact one of our nurseries. See <http://www.forest.nsw.gov.au/contactus/default.asp#nurseries> for details.

– Leah Flint Communications, Maitland

Wollemi pines will be sold from Forests NSW Nurseries in 2006. Left to right: Wollemi pine fossil. This pine is suited to pots and gardens. Photos copyright Jaime Plaza from the Botanic Gardens Trust



## December – February 2006 events

- 2-3 December Teachers' bus trip to the forests of the Hunter and central coast. A hosted tour for teachers and environmental educators  
Carolyn Smith Ph: (02) 4931 6540
- December Sale of Christmas trees at Cumberland Forests Nursery located at 95 Castle Hill Road, West Pennant Hills, Sydney  
Cumberland State Forest Ph: (02) 9871 3377 or 1300 655 687
- Dec – February Cumberland State Forest activity program  
A variety of fun activities led by rangers and staff.  
Special school holiday program too! Bookings essential  
Cumberland State Forest Ph: (02) 9871 3377 or 1300 655 687
- 6-7 January Pambula Show  
Forests NSW will have a display at this event on the far south coast. Pambula Sapphire Coast District Show Society  
Susan Fowler Ph: (02) 64951522

## hot off the press

– our latest publications

### Real stuff – hard copy publications

(all prices are GST inclusive)

#### Seeing Report (free)

Forests NSWs eighth sustainability report, giving an overview of Forests NSWs performance across a range of social, environmental, economic and sustainability indicators for 2004/05.



#### Annual Report (free)

Covers Forests NSWs financial performance for 2004/05.

Copies of Forests NSW publications are available from Forests NSW offices across NSW. To locate your nearest office or to order publications call 1300 655 687, fax (02) 9872 6447 or email [cumberland@sf.nsw.gov.au](mailto:cumberland@sf.nsw.gov.au)

### Research and Technical Papers

Mass movement hazard assessment associated with harvesting of the 1962 age class of Monterey pine (*Pinus radiata* D. Don) in Canobolas State Forest New South Wales. Forest Resources Research – Research Paper No. 39 by W. Erskine – \$13.30

Effects of logging and burning regimes on forest fuel in dry sclerophyll forests in south-eastern New South Wales. Initial results (1986 -1993) from the Eden Burning Study Area. Forest Resources Research – Research Paper No. 40 by R.G. Bridges – \$9.90

Carbon flow following the harvest of blackbutt trees and their conversion into sawn products. Forest Resources Research – Research Paper No. 41 by F.A. Ximenes, W.D. Gardner and J.F. Marchant – free

Methods of determining the moisture content of wood (Revised). Forest Resources Research – Technical Paper No. 41. by J. Hartley and J. Marchant – \$6.60

Targeting planted forests for dryland salinity control Forest Resources Research – Technical Paper No. 69 by P. Walsh, K. Montagu, B. Royal and S. Dobson – \$6.60

Note on the actinomycetes of the *Streptomyces hygroscopicus*-like complex in traditional taxonomy Forest Resources Research – Technical Paper No. 70 by L. Gerretson-Cornell – \$5.50

Production and use of forest products in Australia Forest Resources Research – Technical Paper No. 71 by F.A. Ximenes and W.D. Gardner – free

Copies of the above publications are available from the publications officer, Forest Research, Ph: (02) 9872 0111

### Virtual stuff – New info on our web site

Termites in NSW. The latest information on termites and their biology and how to detect and treat any infestations. See: [www.forest.nsw.gov.au/research/pdfs/termites/tech-pub-termites-01.pdf](http://www.forest.nsw.gov.au/research/pdfs/termites/tech-pub-termites-01.pdf) and [www.forest.nsw.gov.au/research/pdfs/termites/tech-pub-termites-02.pdf](http://www.forest.nsw.gov.au/research/pdfs/termites/tech-pub-termites-02.pdf)



# IN *the* Living Forest

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*plus \$5.00 postage and handling*

