



Highlights & Achievements

COOPERATIVE RESEARCH CENTRE FOR FORESTRY

2006



researching sustainable forest landscapes

Climate change impacts on plantations

Forestry employment and spending

largest survey ever

High-value wood from plantations

first results from the sawmill

Forest managers of tomorrow

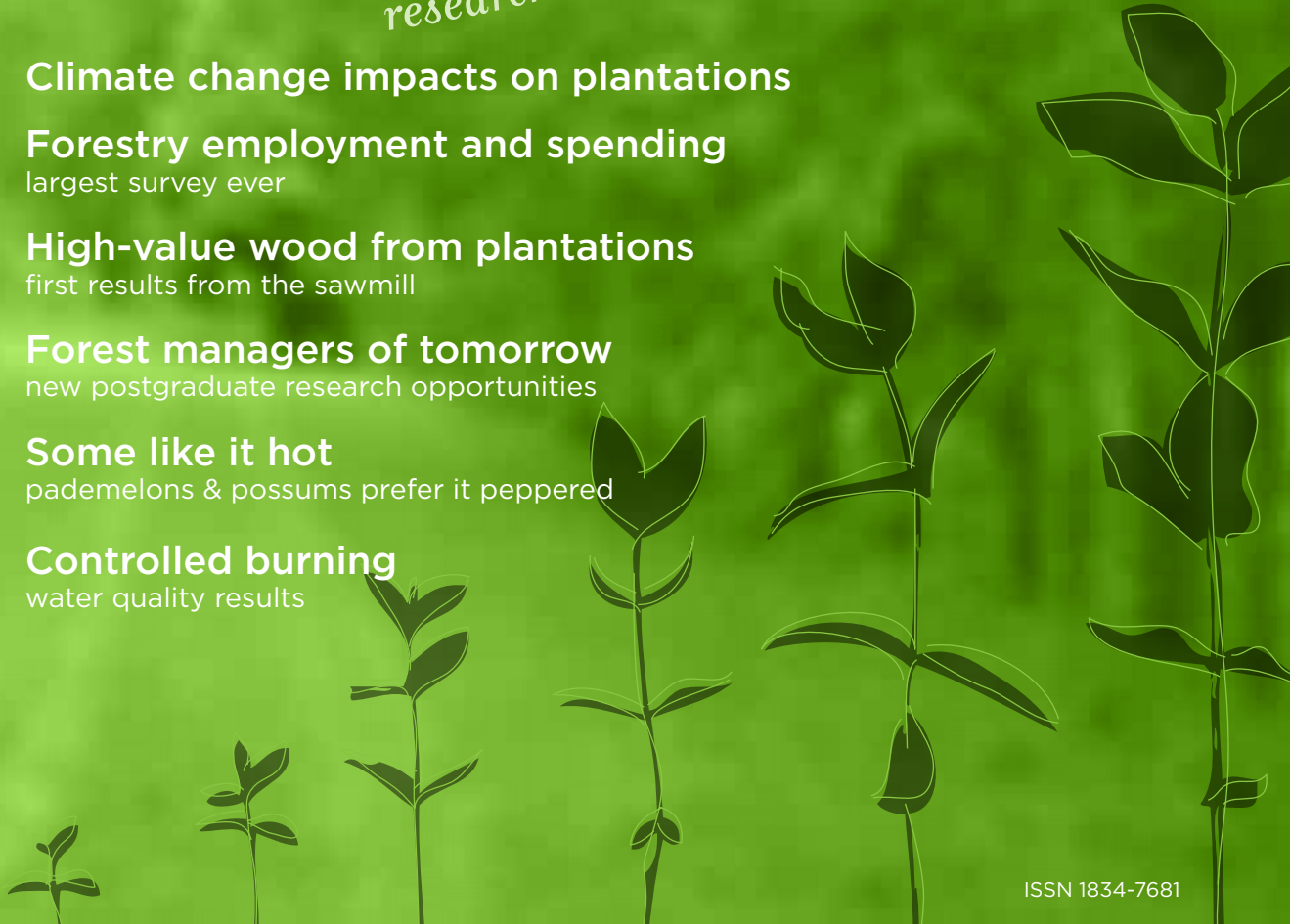
new postgraduate research opportunities

Some like it hot

pademelons & possums prefer it peppered

Controlled burning

water quality results



Welcome

FROM THE CEO

Welcome to the Cooperative Research Centre for Forestry. We are a national partnership between leading Australian forest research organisations, forest industry companies, government agencies and universities. Our role is to support a sustainable and vibrant Australian forest industry through research, education, communication and collaboration. The CRC for Forestry focuses on innovation, value-adding and competitive advantage; maintaining biodiversity, landscape and community values.

Although just over one year into our seven year programme, we are able to report some exciting outcomes and achievements.

As this report shows, the research programmes of the CRC for Forestry span the whole value chain of this nationally important industry, including the social and environmental values of forests. With three new industry partners in 2006, the CRC for Forestry continues to grow and to address current and emerging R&D needs. Thank you and congratulations to all who have contributed to these achievements so far.

Professor Gordon Duff, CEO.

See also: profile on page 7

Highlights & Achievements 2006
is a publication of
CRC Forestry Limited

May 2007

CRC for Forestry
Private Bag 12
Hobart TAS 7001
Australia

Phone: 03 6226 7947
Fax: 03 6226 7942
www.crcforestry.com.au

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Printed on Spicers Precision Laser (Australian-made paper from 100% sustainably managed plantation pulp) printed with vegetable-based inks.

Editor: Taylor Bildstein,
Communications Manager
Taylor.Bildstein@crcforestry.com.au

Design & typesetting: Futago
www.futago.com.au

Printed by: Focal Printing Pty Ltd

Major highlights

2006

- More than 20 new postgraduate students commenced. Each project is fully integrated into the CRC's longer term research objectives (pp. 4-7)
- Survey of more than 1,000 members of the forest industry in Western Australia and Tasmania to evaluate employment and spending in the Australian forest industry (p. 14)
- 11,546 individual deadwood-dependent beetles and 311 species analysed (p. 12)
- More than 80 trees processed as sawn boards and their value-determining properties assessed in the most detailed study on plantation-grown *Eucalyptus nitens* sawlogs ever undertaken (p. 11)
- A successful experimental controlled burn in north-eastern Victoria to measure impacts on catchment water yield (p. 12)
- Recruitment of international experts and international linkages formalised, to rebuild Australia's research capacity in harvesting, transport and operations (p. 10)
- Addition of three new partners: ForestrySA, Midway and the Queensland Government Department of Primary Industries and Fisheries
- New CEO Professor Gordon Duff appointed (p. 7)
- A new multi-partner project measuring land use change in the Green Triangle and Central Victoria commenced (p. 14)
- Twenty public seminars about the socio-economic impacts of plantation forestry were held in five states (p. 14)

With 29 partners operating in every state and territory, there's just too much going on to include it all in this report. For more information see www.crcforestry.com.au





Postgraduate research

DRIVING THE SCIENCE

From where she is now, a CRC for Forestry PhD student at Murdoch University, it seems Kate Taylor was destined to become a scientist. But it wasn't always that way.

“Like most people out of high-school, I had very little idea of what I would like to achieve with my life,” she says.

“In the end my choices were based upon my interests, and after being introduced to the fascinating world of fungi as an undergraduate student, I went on to study a PhD investigating the eucalypt fungal disease *Mycosphaerella* in eastern and Western Australia,” says Kate.

Kate is one of around 20 postgraduate students who have been welcomed into CRC for Forestry research programmes in 2006. CRC students are located country-wide and work across each of the research programmes. As well as Australians, CRC scholarships have attracted students from as far as Austria, Chile, France, India and Spain.

Being part of the CRC provides friends and contacts for life, integrated research opportunities, world-class scientific and industry mentors, and a unique student community. Students also enjoy high levels of project funding, and skills and leadership development.

“The functionality of the linkages between research and industry partners is one of the great strengths the CRC offers students”, says Professor Peter Kanowski, Chair of the Education Programme.

“Student projects matter to industry partners, and students can really enhance industry understanding and change industry practices through communicating the results of their research. Our students are real partners in the research, development and implementation process,” he says.

scholarships

Whatever your background and experiences (whether you've just finished Honours or you've been working in the industry for the past 20 years) there may be a postgraduate research project to suit you. The CRC for Forestry seeks bright minds to engage with research in the forest sciences, from water to fungi, from sociology to LiDAR, from soils to harvesting engineering... and beyond: there may be a research project to suit your interests and aspirations. For more information see:

www.crcforestry.com.au/scholarships

Meet Caroline Dunn

PHD STUDENT, UNIVERSITY OF MELBOURNE

Linking community attitudes research to managers' practices

I began my PhD project in 2006 after qualifying for a Master of Environment at The University of Melbourne, which included social research around community forestry based in Thailand.

As a result of that experience, I'm convinced that solutions for sustainable land management lie in bringing different disciplines together and that social research has a lot to offer forest management by helping understanding of the community.

Stage one of my project explores perspectives on forestry through people's lived experiences in three regions: the Green Triangle and Central Victoria, Tasmania and southern Western Australia. Focus groups were conducted in each of these regions and the next step is to survey all regions to understand to what extent particular views about plantation forestry are held, and why these views might be held.

For more on the Communities Project see page 14

I'm also looking at how this research is used, to help improve how social research contributes to managing for community issues in relation to plantation forestry.

To meet our other students see:

www.crcforestry.com.au/students.htm

looking to the future

Caroline is well placed not only to deliver community information needs but she could also become one of Australia's future managers in her field. CRCs for forestry have a long history of educating and training future leaders, and former students of the CRCs for Temperate Hardwood Forestry (1991-1997) and Sustainable Production Forestry (1997-2005) can be found working for private and government business enterprises, NGOs, state and federal governments and the CSIRO in leadership roles in Australia and overseas.



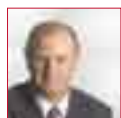
Meet the CEO

PROFESSOR GORDON DUFF



The Board & CEO

Partnership benefits



BOTH STUDENTS & INDUSTRY

by Tim Browning, General Manager,
Timbercorp Forestry

Timbercorp Forestry has been working with the CRC for Forestry since its inception. Our involvement ranges from working with and assisting postgraduate students and research scientists, implementing research outcomes into our day to day operations and contributing to the broader research agenda.

Working with the students of the CRC is particularly rewarding, with benefits going both to students and to Timbercorp. Students gain access to an industrial plantation estate (as compared to an experimental site), they are exposed to “on the ground and real life issues”,

motivation and direction, and understanding of the relevance and need for their research. At the same time, Timbercorp develops working relationships with promising researchers who we may work with in future, and we obtain access to important research results and improved technologies for our estate.

The CRC for Forestry also offers Timbercorp employees a valuable opportunity for further study and education.

Timbercorp looks forward to continuing this mutually beneficial relationship. We expect that, in addition to continuing to assist students with access to our estate and in-house expertise, we will be their employer of choice upon graduation. Indeed, our last two technical services chiefs have both come to us after obtaining their PhDs through CRCs.

www.crcforestry.com.au/students.htm

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New CEO Professor Gordon Duff has a rich history with CRCs, the education sector, and successful cooperative partnerships.

His most recent role was as CEO with the CRC for Tropical Savannas Management, which – similar to the CRC for Forestry – brought together a range of different stakeholders.

“One of the special roles for a CRC is to help dialogue between sometimes competing interests. The Tropical Savannas CRC was a success in this area and I’m certain the same will be said for the CRC for Forestry,” says Gordon.

Gordon’s involvement with CRCs extends back many years and is ongoing.

“The CRC model is admired worldwide as a great means of delivering timely innovation and know-how to industry,” says Gordon.

“It’s very satisfying to work in a science-based organisation focussed on making a difference and having an impact,” he says.

Gordon has also held a variety of non-CRC leadership positions in natural resources management and research, and remains Chairman of the Board of the NT Environment Protection Authority.

He graduated from the University of Tasmania in 1981 with Honours in Botany and completed a PhD at James Cook University in forest ecology and ecophysiology in 1987.

MEET THE BOARD

The CRC for Forestry is run by an independent board of directors. Chair Kate Carnell is former CEO of the National Association of Forest Industries, former Chief Minister of the Australian Capital Territory and an Officer of the Order of Australia. Together the eight directors have backgrounds in scientific research, private enterprise, government, innovation and commercialisation.

This team of highly-skilled and experienced professionals provide the CRC for Forestry with strategic guidance to support Australia’s forest industry for a more profitable, socially and environmentally responsible future.

www.crcforestry.com.au/contact

The Board and CEO, pictured above, from top, left to right:

- Ms Kate Carnell, Chair
- Dr Rick Ede
- Mr Bob Pearce
- Dr Hans Drielsma
- Mr Tim Browning
- Mr Rob Woolley
- Prof. Gordon Duff, CEO
- Prof. Jim Reid
- Dr Gary Inions

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Managing & monitoring for growth & health

RESEARCH PROGRAMME 1

GETTING THE DIRT ON SOILS

Unlike the agricultural industry in Australia, forest managers haven't had access to an easily accessible, comprehensive soil dataset – until now.

The CRC for Forestry is working with CSIRO Land and Water to complete soil datasets for forestry regions for the Australian Soil Resource Information System (ASRIS).

“Using ASRIS means we're able to add value to what's already established, while delivering forest soils information faster and more efficiently than we would otherwise be able to,” says project leader Dr Michael Battaglia.

The multilayer dataset allows soils information to be linked with other data at the required scale so the right mixture of land uses can be assessed.

“ASRIS focuses on the properties that land managers need to know about, for example drainage, rather than soil types. Everyone can access the information they need on the ASRIS website,” says sub-project leader Jody Bruce.

“Using ASRIS and Google Earth allows people to visualise the information within the landscape, which means they'll be more likely to understand it and use it well,” says Jody.

www.asris.csiro.au

Top: Google Earth images of terrain near Tumut, New South Wales (left; elevation exaggeration x 3) and north-east Tasmania (right) with a multi-resolution valley bottom flatness (MrVBF) layer showing soil deposition, which is usually an indicator of deep soils. Images © 2007 Google™, TerraMetrics, Europa Technologies, DigitalGlobe and NASA.

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RESEARCH PROGRAMME 1

PREDICTING PESTS IN PLANTATIONS UNDER CLIMATE CHANGE

Potentially, Australia's net carbon emissions could be reduced with carbon sequestration from the three million hectares of plantations that will be established by 2020. But could this be different under climate change scenarios?

Drawing upon knowledge and models developed through the CRC for Sustainable Production Forestry (1997-2005), CRC for Forestry partner Ensis began in 2006 to investigate the potential for climate change to impact on pests and the carbon stores of plantations.

“This is an excellent example of work from CRCs for forestry enabling our research partners to take the next step in their science,” says Research Programme Manager Dr Michael Battaglia.

The project uses computer models and new experiments to explore the impact of climate change on the dynamics between plantation trees and their pests, and carbon sequestration.

The group is also looking at how future conditions might influence pest-tree interactions.

“Trees in the future may be more stressed as a result of climate change” says project scientist Dr Libby Pinkard, “so we're investigating how factors like drought and nutrient stress might affect the way trees respond to pest attack.”

www.crcforestry.com.au/rp1

Above & below: students and scientists working on a defoliation experiment. The information they are collecting will be added to the CABALA computer model to help answer these climate change-related questions.

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Harvesting & operations

RESEARCH PROGRAMME 3

Up to 10 times more money is spent during the last few hours of the plantation tree's life than in the 15 years leading up to that moment – harvesting and transport costs CRC for Forestry partners alone more than \$420 million annually.

Yet all recent harvesting and operations research has come from overseas – until now.

The first move in rebuilding Australia's research capacity was to make formal links with international leaders and to meet with industry to understand its needs.

“While some international research may be transferable, most needs to be adapted to the Australian environment,” says Tom Fisk of the Harvesting and Operations research programme.

In 2006, Dr Mauricio Acuna was recruited from Chile and a formal relationship has been established with Professor Loren Kellogg of the Forest Engineering Department at Oregon State University (OSU), who will take a research leadership role in Australia for 12 months from mid 2007.

www.crcforestry.com.au/rp3



High value wood resources

RESEARCH PROGRAMME 2

How to profitably grow and process 100,000 hectares of Australian plantation hardwoods for sawn timber, veneer and engineered wood products is the challenge being met by the High Value Wood Resources research programme.

“It's a different type of wood resource compared to native forest sawlogs,” says programme manager Dr Chris Harwood.

“Log value is defined by the types and values of products obtained from the logs. Silviculture and genetic improvement combined with appropriate processing systems can lift that product value,” he says.

In 2006, CRC scientists examined sawmill trials from a pruned 22-year-old *Eucalyptus nitens* plantation.

“This is the most detailed study done on plantation-grown *nitens* sawlogs to date,” says Chris.

CRC scientists are also looking at tree growth data collected over the plantation's life, and how tree shape and size at different plantation stockings affects product value.

Chris says the main factor limiting the value of the plantation-grown boards is surface checking – surface cracks on the boards caused by shrinkage during drying.

Further trials will test whether different drying techniques can reduce surface checking to levels that the market will accept.

www.crcforestry.com.au/rp2





Trees in the landscape

RESEARCH PROGRAMME 4

Biodiversity

SOME LIKE IT HOT

Research into alternative methods of controlling browsing animals like pademelons and possums has yielded surprising results.

Three repellents were tested: a grit-based repellent that gives eucalypt leaves a sandpaper-like texture, a synthetic dog urine that browsers associate with the threat of predators, and a chilli alkaloid.

While the chilli product claims to be an effective deterrent for brushtail possums in New Zealand, the study showed that Tasmanian possums go out of their way to eat leaves covered in it!

The grit-based product will now be tested to see which combination of manipulated seedlings and repellent treatments best deter browsing animals.

www.crcforestry.com.au/RP4_2

DEAD WOOD DYNAMICS

In 2006 Dr Simon Grove finished analysing deadwood-dependent beetle data (11,546 individuals and 311 beetle species) from a long-term monitoring project, again demonstrating the value of dead wood in forest ecology and our need to manage it sustainably.

A computer model is being further developed to help understand the decay dynamics of dead wood across the forest landscape. It will also have

a carbon accounting role because of the huge volumes of dead wood in wet eucalypt forests.

www.crcforestry.com.au/RP4_2

PLANTATIONS NEXT DOOR

- better neighbours for biodiversity?

Relationships between industry and scientists have the CRC well placed to research the effect of plantation establishment around remnants on their biodiversity.

Remnants are stepping stones for animals and birds to move across the landscape. To receive sustainability certification (such as FSC or AFS), the plantation industry must demonstrate that native forest remnant condition within the estate has been maintained or improved.

The CRC will assist by producing decision support systems that draw upon remnant research by six new students and a post-doctoral fellow.

Early results suggest that surrounding a remnant with plantation - and removal of stock grazing - seems to have a beneficial effect on remnant health and biodiversity. If this turns out to be the case, this will be an important positive message to come from the plantation industry.

www.crcforestry.com.au/RP4_2

Water

In 2003 wildfires burnt two million hectares in three states costing the Victorian Government alone more than \$70 million. A firefighter was killed, and more than 1,000 tour operators were affected.

To try to reduce future fire damage, Victoria has since embarked upon a more frequent controlled burning programme in native forests. The government also wants to know what effect this will have on water quality, quantity and erosion.

To find out, the CRC is conducting experiments to understand the impact of fuel reduction burning on catchment water yield.

Project leader Dr Patrick Lane says no significant water quality issues have been detected so far.

www.crcforestry.com.au/rp4_1





Communities

RESEARCH PROGRAMME 4

The biggest and most comprehensive survey ever undertaken to evaluate employment and spending in the forest industry in Australia was undertaken by the CRC for Forestry in 2006, involving more than 1,000 members of the industry in Western Australia and Tasmania, including small contractors.

Few surveys have been done in the past to gather this type of information, and none at such a fine scale. The survey includes employment data specific to local government areas, and separate information on native forest and plantation activity.

“This will mean local governments will be better able to understand how the forest industry contributes to their area,” says project leader Dr Jacki Schirmer.

The employment and spending data can be used to help local governments with infrastructure planning, while more generally the information will show how changes in production forestry transfer across to changes in employment.

Also in 2006, Jacki presented 20 seminars in five states for more than 1,000 members of the public to help inform debate about the socio-economic impacts of plantation forestry.

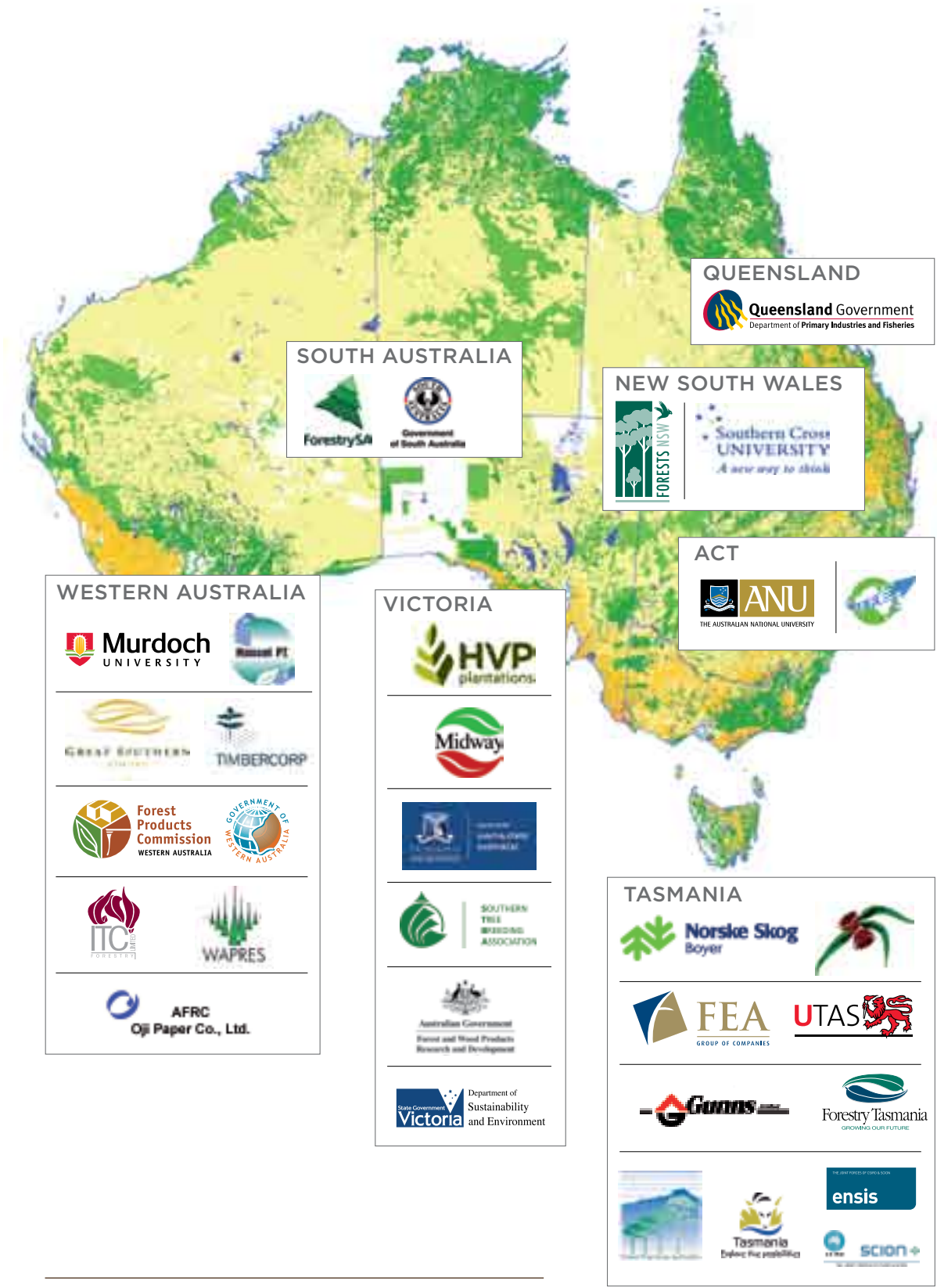
www.crcforestry.com.au/rp4_3

See also: student profile, Caroline Dunn, page 5.

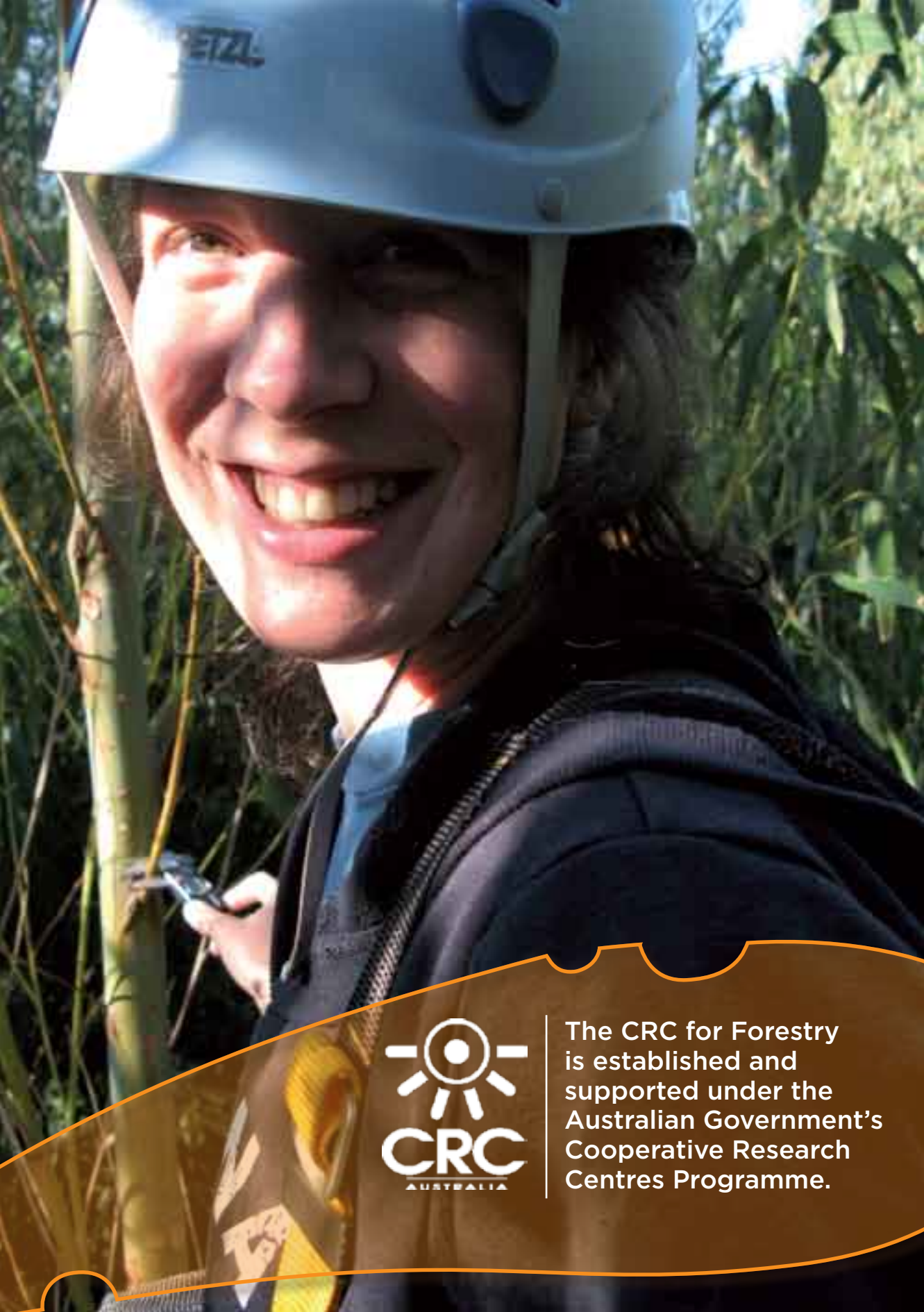
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CRC for Forestry partners



Map: courtesy Bureau of Rural Sciences, 2003 <http://www.brs.gov.au/plantations>
Forests NSW is a public trading enterprise within NSW Department of Primary Industries



The CRC for Forestry is established and supported under the Australian Government's Cooperative Research Centres Programme.