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RFA Mailing List
Locked Bag 104
Bentley Delivery Centre WA 6983

How you can be involved in the Regional Forest Agreement for Western Australia



An explanation of the process for developing a Regional Forest Agreement in south-west forests and how you can participate in the sharing of information and responsibility for developing recommendations on the balanced management of south-west forests.



A joint Western Australian and Commonwealth Government Process.



What is a Regional Forest Agreement?

A Regional Forest Agreement (RFA) is an agreement between a State Government and the Commonwealth Government which covers aspects of conservation, management and forest resource allocation.

Under the National Forest Policy Statement signed by the Commonwealth and Western Australian governments in December 1992, the governments agreed to a framework and a joint scientific and public consultation process for a comprehensive regional assessment (CRA) of forests leading to negotiation of a Regional Forest Agreement for Western Australia.

To assist in developing the processes and timetable for the development of a RFA for Western Australia, a Scoping Agreement was signed by both governments in July 1996. The Scoping Agreement deals with south-west forests as a single region and includes both public and private forested lands. It outlines that the RFA is to provide for long-term ecologically sustainable management of forests and the development of competitive and efficient forest industries thus ensuring:

- protection of forest conservation values;
- ☐ the basis for an internationally competitive forest products industry; and
- the effective use of other economic and social resources.

The Scoping Agreement describes a series of comprehensive regional assessments which the governments will undertake jointly for the purposes of the RFA. In this context, the RFA is designed to:

- provide for the establishment of a comprehensive, adequate and representative (CAR) forest reserve system which includes strategies to protect high conservation value old growth forests and wilderness;
- ☐ identify the potential for Western Australia's forest-based industries;
- address biodiversity and threatened species issues;
- address Indigenous, National Estate and World Heritage issues;
- define those forest areas available for securing sustainable commercial use of forests;
- accredit codes of forest practice and other management arrangements;
- identify forest resource use and sustainable industry development options and examine any potential economic and social implications, including implications for communities;
- identify performance indicators and develop monitoring arrangements to report on the RFA every five years.

The RFA process will be designed to meet State and Commonwealth legislative responsibilities such as the need for appropriate environmental impact assessment.

Deferred Forest Agreement

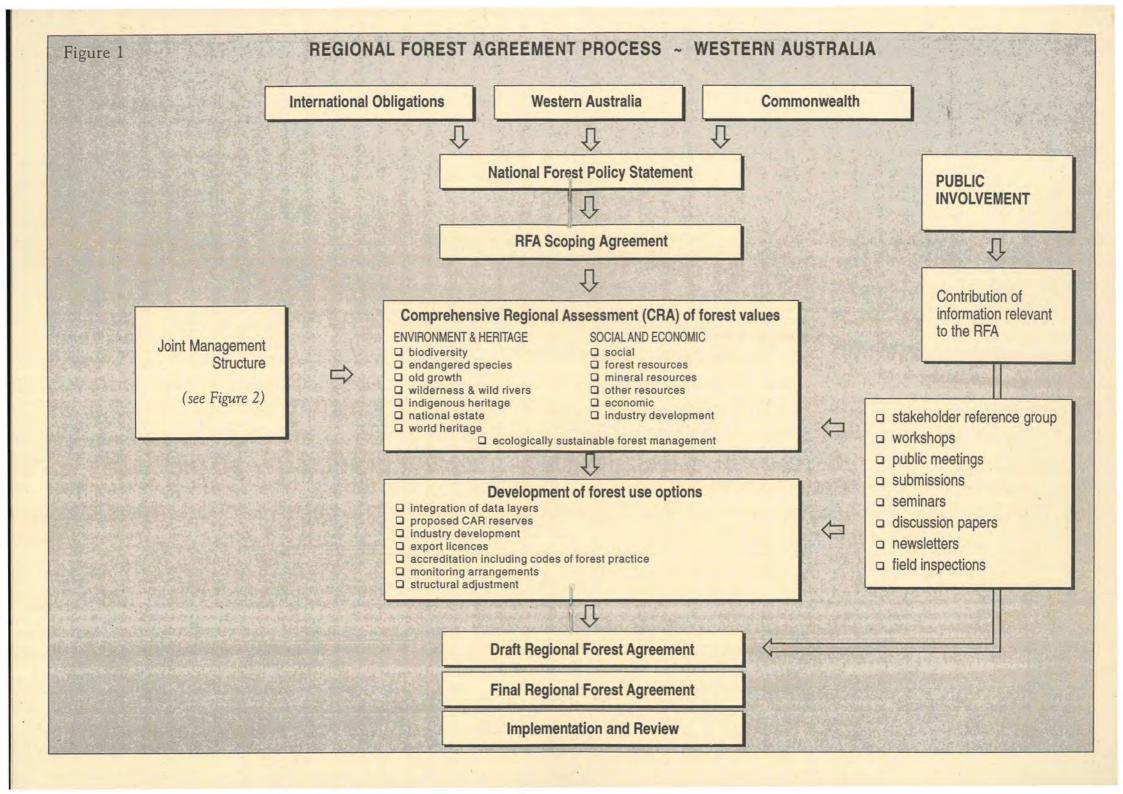
A Deferred Forest Agreement was signed by both governments in July 1996. The Deferred Forest Agreement defers timber harvest in agreed areas which provide a range of reserve selection and design options for the proposed comprehensive, adequate and representative reserve system while providing for ongoing timber harvest operations while the RFA is being developed.

Public Consultation and Development of the RFA

Western Australia and Commonwealth governments are jointly responsible for all natural, social and cultural assessments contributing to the RFA process (Figure 1). In recognition that effective community involvement is critical to the successful completion and enduring life of the RFA, public consultation will be a feature of the development of the RFA.

The public consultation process provides for participation in four distinct ways - first, input to the information gathering stage, secondly through workshops, seminars and public meetings which explore the methodologies proposed for each CRA assessment, thirdly in the development of options, and fourthly through written submissions on the draft RFA. The information gathering stage includes all relevant biophysical, social, cultural and economic issues and provides an opportunity for the information base to be modified, clarified or corrected through a range of public consultation opportunities and through written submissions. To assist in the complex task of presenting and consulting on the wide ranging matters to be dealt with in the RFA discussion papers will be made available for comment and a newsletter will be published.

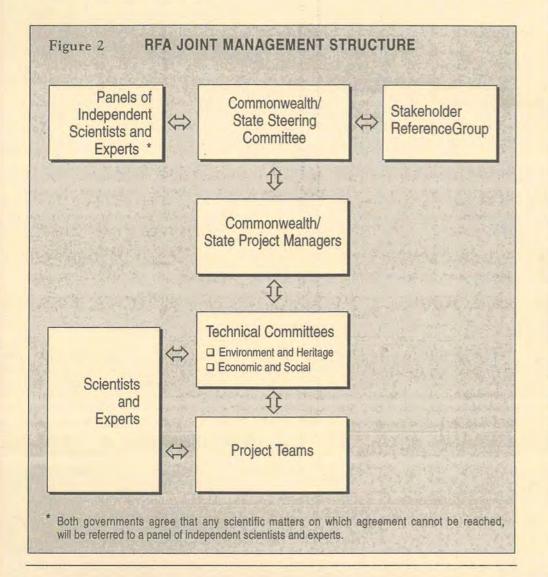
The consultation process will be both wide-ranging and participatory through carefully focussed issue-specific consultation for those key matters requiring special attention. Workshops will be run by an independent facilitator. Feedback is an integral part of the consultation process, mainly via acknowledgments of how information emanating from the public consultation process has been used in the development of options. Workshops with stakeholders and community groups will be organised for key input to the information in the assessments as well as during the development of options. Public consultation forums and workshops will be held in appropriate locations and venues across the south-west.



How you can be involved in the public consultation process

As can be seen in Figure 1, there are multiple opportunities for public participation in the development of the RFA. Prominent notices will be lodged in 'The West Australian' and major south-west newspapers to announce public participation opportunities. Information also will be shared through occasional information sheets and a newsletter.

If you wish to participate in the process for the development of the RFA, please fill out the form below, tear-off and return to the address provided (no stamp is required) and you will be added to the RFA mailing list.

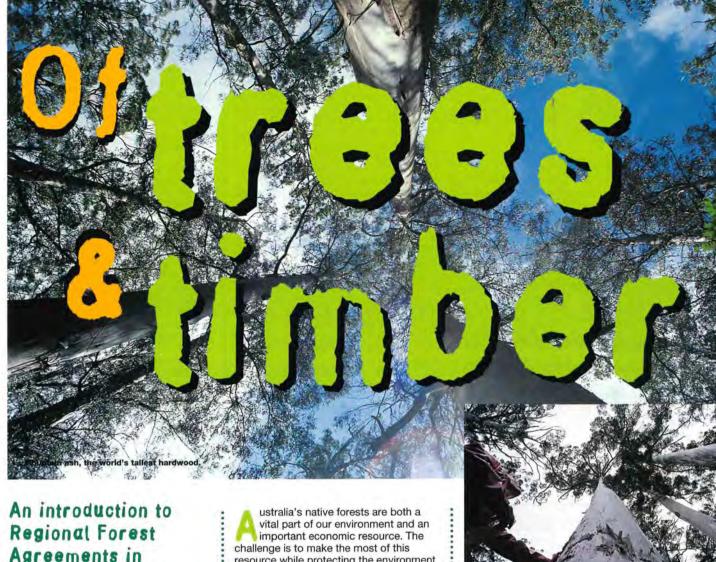


Please complete and return

(no stamp required)

Name:
Organisation:
Position in Organisation:
Mail address:
Postcode:
Day telephone number:
Fax number: (if available)
Would you like copies of Information Sheets and newsletters on the RFA as they become available? Y N
So that the RFA consultation process can be responsive to your needs, could you provide the following information about where and when consultation would be convenient and any other suggestions you may have on the public consultation process.
Suggested location for meetings:
What time and day of the week best suits you or your organisation: weekday weekends daytime evening Which of the RFA assessments are you primarily interested in (refer to Fig. 1)?
Any other suggestions you may have on the public consultation process:
This outsit suggestions you may make our one passes outsituding process.
For further information contact: RFA Steering Committee C/- Department of Conservation and Land Management Locked Bag 104 BENTLEY DELIVERY CENTRE WA 6983
Contact Officers:
Western Australia – Alan Walker (09) 442 0321 Fax: (09) 389 8603

Fear along dotted line



Agreements in Australia and how they're protecting our forests while creating jobs in an ecologically sustainable forest industry.



Before the arrival of Europeans, nine per cent of Australia was covered with forest. Of this area, 40 per cent has been cleared, mostly for agriculture.

resource while protecting the environment for future generations. This is part of what is meant by 'ecologically sustainable forest management'.

To meet this challenge, the Commonwealth Government has been working with State Governments to draw up agreements that outline how, when and where forests may be logged and used for other purposes in a way that conserves ecosystems and maintains a viable forest based economy.

The agreements are called Regional Forest Agreements (RFAs), and this Special Feature explains how they are reached and why they are so important to our future. This Special Feature is brought to you by Environment Australia and the Department of Primary Industries and

What's a forest worth?

Australia's native forests are a national treasure and one of our most renewable economic assets.

Since European settlement, our forests have been a major source of timber and other wood products. The harvesting and processing of this timber have provided thousands of jobs and income, especially for families and communities in many of Australia's country areas. Without the logging and regrowth of our native forests, some towns would close down.

Wherever we live, our forests provide

Different people place different values on our

many of the products we use every day, from housing and furniture to fuel and paper (see Industry from the forest).

However, the ecosystems that make up our native forests are also a valuable reserve of biodiversity (variety of life). Biodiversity underpins the processes that make life possible and is central to a healthy environment. The loss of biodiversity is one of the major threats facing the Australian environment.

Forest biodiversity is measured by the number of flora and/or fauna species, or by the number of forest types in relatively close proximity. Biodiversity changes from place to place because of a number of factors including differences in terrain, climate (and microclimate), soil and fire history (natural or artificial fires managed by Indigenous people over many thousands of years).

As well as being a reserve of biodiversity, our forests purify the air, and are the filters that ensure reliable and high quality water supplies. Water catchments covered in healthy forest provide the cleanest run-off requiring the least treatment.

And, of course, our forests serve the community as a valuable place of rest and



recreation. They're among the places we escape to when the pressures of city living drag us down and are an important part of the tourism industry.

Different people,

Because different people place different values on our native forests, it's not surprising that conflict sometimes arises. Forest workers want continued access to forest areas so they can continue to support their families, so their industry will



Harvesting of timber has been an important industry to Australians right from the time of European settlement. It's still the lifeblood of many country areas.

be able to continue to support the local community, and so Australia won't need to buy so many forest products from overseas. Environmentalists want to protect the forest's natural values.

Sometimes these aims have been at odds with each other, and most of us will have seen in the media some of the bitter confrontations between those seeking to work the forest and those wanting to

prevent any work from taking place. Indeed, if there's any topic that's likely to get a heated argument going, it's how we should be using Australia's native forests.

The management of native forests is the responsibility of State governments and may vary according to regional differences in forest types. However, the Commonwealth Government is responsible for coordinating a national approach to both environmental and industry development issues.

The Commonwealth has also joined with other countries in trying to ensure that all the forests of the world are sensibly looked after.

The history of Australia's unique forests

Between 50 and 60 million years ago, Australia broke off from the former supercontinent of Gondwanaland. The flora and fauna on the Australian 'raft' commenced their own distinctive evolutionary journey resulting in our peculiar dominance of marsupials and eucalypts. For example, we have more than 800 species of eucalypt in forests ranging from tropical rainforest in the north to temperate forests in the south. About 98 per cent of these species are found only in Australia.

Some species of flora and fauna in our native forests have hardly changed over millions of years and are important links with our long distant past. Their habitat has particular conservation value.

Scientists estimate that since the Europeans arrived more than 200 years ago, about 40 per cent of our native forest has been cleared, first for timber by the early settlers, but mostly for agriculture. By the 1930s all States had created forest services, and the area of native forest in State Forests stopped declining. Today, Australia protects a high proportion of its

native forests compared with other countries

Of our 40 million hectares of 'dense' native forest, about 22 per cent is in national parks or parts of State forests which are not available to forestry. In East Gippsland, 50 per cent of the public forest is in reserves.

In contrast, the World Wide Fund for Nature estimates that only 6 per cent of the world's forests are protected, and has launched a campaign for all countries to protect at least 10 per cent of their existing forest.

Pathway to agreement

For many years the various players in the forest debate have been searching for balance between the needs of industry and conservation. Conflict and uncertainty was serving no-one. The forest industry was unprepared to invest money for new industries in any region unless it had the long-term security needed to justify the investment. Conservationists were finding it difficult to have valuable areas of forest placed in secure reserves. An agreement was needed to introduce certainty into future planning for management and conservation.

An important step towards an agreement was the drafting of the 'National Forest Policy Statement' which the Commonwealth, State and Territory Governments signed in 1992, with Tasmania signing later in 1995. They

Here are several Web sites to keep you up with the latest on the forest debate.

http://www.erin.gov.au/land/forests/rfa.html The Regional Forest Agreements Web page presents the latest reports, maps and statements as they become available

http://www.erin.gov.au/land/forests/forests.html A general Australian forest web page set up by the Environmental Resources Information Network that provides a diverse range of information about Australia's forest regions.

http://www.dpie.gov.au/dpie/forestry.html The forestry page of the Commonwealth Department of Primary Industries and Energy.

http://www.calm.wa.gov.au

Naturebase, the award winning web site of the Western Australian Department of Conservation and Land Management presents valuable information on WA's forests.

http://www.nsw. gov.au/racac/reports/far/ Web site set up by the NSW Resource and Conservation Assessment Council that presents all the reports and maps from recent forest assessments done in that State.

http://www.nafi.com.au

he Web site of the National Association of Forest Industries gives the story from the forest industry perspective and has a new club and magazine for kids, called Timber Trek.

http://www.peg.apc.org/~acfenv/ The Web site of the Australian Conservation Foundation provides a wealth of forest information from the viewpoint of Australia's leading conservation group.

Industry from the

orests are the basis of big business for Australia. Australia's forest and forest products industries employ over 82 000 people, 57 000 of whom are employed in the manufacture and processing of wood and paper products. With an annual turnover of more than \$10 billion, they are our second largest manufacturing industry.

Australia produces about 83 per cent of its sawn timber needs, getting 40 per cent of this from

native forests and the remainder from about a million hectares of mostly softwood plantations. The wood is processed at more than 1100 hardwood mills and 265 softwood mills. Australia has 22 mills producing pulp or paper products and 18 panelboard mills

However Australians still spend more buying timber products from overseas than we make through exports, which is why the industry wants to plan ahead to find new markets.

As well as the timber industry, tourism is a key employer in our native forests, with millions of people from Australia and overseas visiting reserves every year. In East Gippsland, for example, the tourism industry directly provides around 300 jobs for local people. Forests are also important for a

number of other economic activities including mining, bee keeping, seed collecting and a range of local cottage industries.

With jobs comes demand for services and new opportunities for small business. So as these industries grow and strengthen so does the local community, ensuring people, especially young people, have a future in the region.

Harvesting one hectare of eucalypt trees provides timber for one and a half houses and paper for 750 people for a year.



all agreed to work together to:

set out which forest areas will be in parks and reserves, and which will be available for the production of wood and other commercial and recreation uses, and

 ensure that all forests — whether conservation or commercial — are being managed sustainably.

The Statement also reinforced the roles of the different governments. State and Territory Governments have responsibility for forest management while the Commonwealth is responsible for coordinating a national approach to both environmental and industry-development issues.

Agreeing on a forest

So, what does this mean for any particular forest region? It means first that the Governments need to find out as much as possible about all the different uses and values of the region's forests through a Comprehensive Regional Assessment (see the Science behind the Agreements).

The information for this assessment is collected by working with all the organisations who use and care about the forests, from conservation and industry groups to people living in the region itself. It forms the basis for discussion about which parts of the forest region can be logged and which are to be left for conservation purposes. After the points of view of interested groups and individuals have been considered, an agreement is drafted for the Premier of the relevant State and the Prime Minister to sign.

The agreement is known as a Regional Forest Agreement (RFA) and it lasts for up to 20 years. It aims to meet the goals of the 'National Forest Policy Statement'.

The forest areas that are reserved under an RFA will contain the organisms, animals, plants and habitats that are representative of all the different types of forests in that region. The reserves will

The science behind the Agreement

Before governments can agree on an RFA, they must collect as much information as possible about all the uses and values of the region's forests. That information includes:

the forests' age and biodiversity;

the history and cultural significance of the forests and places in them;

places which may have international significance as World Heritage;

which industries use the forest and will be able to use them in the future;

the growth rate and sustainable harvest level of the trees; and

how an RFA might affect the people and towns in the region.

Together, State and Commonwealth governments make a detailed study of all these things with 'Comprehensive Regional Assessments'. The assessments bring together all the information already collected and fill in the gaps with new research.

Specialists from many fields are brought in to help put together these Assessments, including botanists, entomologists (scientists who study insects), herpetologists (scientists who study reptiles and amphibians), zoologists, forestry scientists, economists, geologists, sociologists, anthropologists and archaeologists.

They use a wide range of methods to obtain the necessary information. For example, satellite imagery maps where the different forest types are, where the forests have been affected by fire, or which areas may have been attacked by pests. Aerial photos can spot special trees that endangered species such as Victoria's Leadbeater's possum might need for habitat.

Botanists working in the field use flora quadrat surveys — detailed studies of measured plots of land — to determine the number of plants in a certain area. Zoologists can study what animals are in an area by spending a number of weeks in the forest trapping animals and then setting them free.

Cultural experts make a list of places in forests that are significant to people because of their history, their beauty, or their use by different groups in the community. They do this by gathering historical reports and other documents, hold workshops and interview people in the community. Other cultural experts look at how Aboriginal people use the forests now and how they used them in the past.

Économists study opportunities for the timber and other industries, estimating the potential for growth and employment.

Foresters work out a forest's 'sustainable yield' — the maximum level of commercial timber a forest can keep producing under a set management regime.

And social researchers study how an RFA will affect people in a town or region through

And social researchers study how an RFA will affect people in a town or region through telephone surveys, workshops and interviews. Just as zoologists and botanists want to find out about how the environment operates, they want to understand how the region operates socially. When all the studies are finished, the information is published in reports and the community

is asked to comment.

System).

operate over an area that will ensure the long term survival of those organisms and ecosystems.

The reserve system aims to preserve 15 per cent of each kind of forest that was here before European settlement. It also aims to include 60 per cent or more of existing old growth forest and at least 90 per cent of high quality wilderness in the region. In this way, the world class reserve system aims to be 'Comprehensive, Adequate and Representative' of the whole forest region (a CAR Reserve

Forests outside the reserves will be managed sustainably for a range of purposes, including the development of an efficient, internationally competitive timber industry.

Altogether, each RFA will endeavour to protect the natural values of the forest regions while providing security of access to forestry and other industries such as mining, tourism, beekeeping, seed collecting and so on.

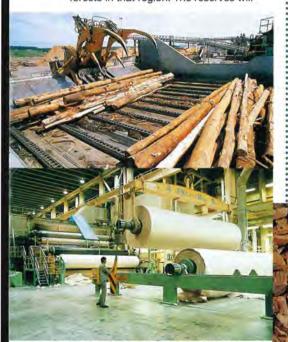
Western Australia's RFA and the forests of the South West

The jarrah and karri forests of WA's South West are unique among Australia's eucalypt forests, both in terms of their biodiversity, and the timber they provide.

For example, the jarrah forest is home to about 240 species of mammals, birds, reptiles, frogs and fish, while about 230 fauna species live in the karri forest. Animals now extinct or under threat in other parts of the country still thrive in these forests, including the woylie, tammar wallaby, quenda, chuditch, western ring-tail possum and numbat.

Forest catchments supply about 200,000 million litres of water each year for domestic and industrial use in the Perth-Bunbury area.

The timber the forests provide is also highly prized nationally and around the world as a source of high quality products, particularly fine furniture. More than 20,000 people are employed directly or indirectly by the timber industry, and WA's wood,



Whether it's through timber, woodchips or paper, our forests are vital to the Australian economy, employing more than 82 000 people.



wood products and furniture industry has a turnover of about \$850 million a year. Under the forest floor are rich mineral deposits of bauxite, gold, coal and mineral sands which earn the State more than

\$2,500 million a year.

With icons like the Gloucester Tree near Pemberton and Walpole's Valley of the Giants, the forests are a major drawcard for tourists, who make about three million visits

Like all RFAs, the WA agreement will aim for a balance between these different uses and values of the forests, based on a thorough and wide ranging comprehensive regional assessment, and consultation with all interested groups and individuals.

The RFA will set in place a first class reserve system. At the same time, it will encourage sustainable and robust forest industries and ensure that the whole unique forest estate is managed sustainably and wisely for future generations.

Sustainable forest management

A critical element of the RFA is making sure that all our forests are sustainably managed for the future, no matter what we use them for. Even in areas where logging is taking place the aim is to maintain the forests' ecological processes and biological diversity.

There are many things foresters and timber workers are doing to ensure that the forest stays healthy and continues to provide timber as well as a home for our unique flora and fauna.

These include:

- controlling feral predators, pests and weeds to minimise loss of our native wildlife and plants;
- leaving an undisturbed 'buffer strip' of trees on the banks of rivers and creeks when logging, to prevent erosion and to protect water quality;
- leaving trees to grow for up to 80 years

or more before they're logged again;

leaving certain trees in logging coupes to maintain habitat for birds and animals, and to provide seeds for new trees to grow;

maintaining strips of forest between logging coupes so wildlife can move safely between suitable habitat areas; and

supervising forest operators to make sure they follow harvesting plans.

Looking into the future

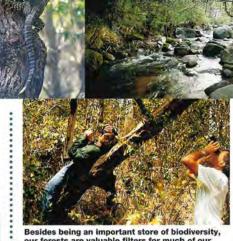
By the year 2000, all our native forests in regions where commercial forestry is important are expected to be covered by Regional Forest Agreements.



Processing timber is an increasingly expensive business requiring enormous investment. Without security of access to our forests, the forestry is unwilling to make such investment.

RFAs are an innovative approach to forest management (they're believed to be a world first). Each RFA will be reviewed regularly, allowing new research results and changing best practice management techniques to be incorporated as appropriate

Because our forests are important to us all, the State and Commonwealth governments want to make sure everyone interested in their future can participate in RFAs. The community can get involved in the decision making by going to public meetings, by finding out about



our forests are valuable filters for much of our er and important destinations for res recreation and tourism.

and by commenting on RFA reports.

There may be an RFA happening near where you live, or in one of the forests you visit with your family or school. If you'd like to find out more about RFAs, contact the Forests Taskforce (see More Information) or check out the RFA web site (see Forests on the Internet).

More information

If you'd like to know more about Regional Forest Agreements, write to the Forests Taskforce, Department of Prime Minister and Cabinet, 3-5 National Circuit, Barton ACT 2600, phone 1800 650 983 or fax (06) 271 5511.







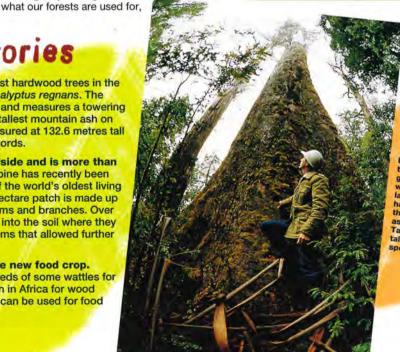


Amazing tree stories

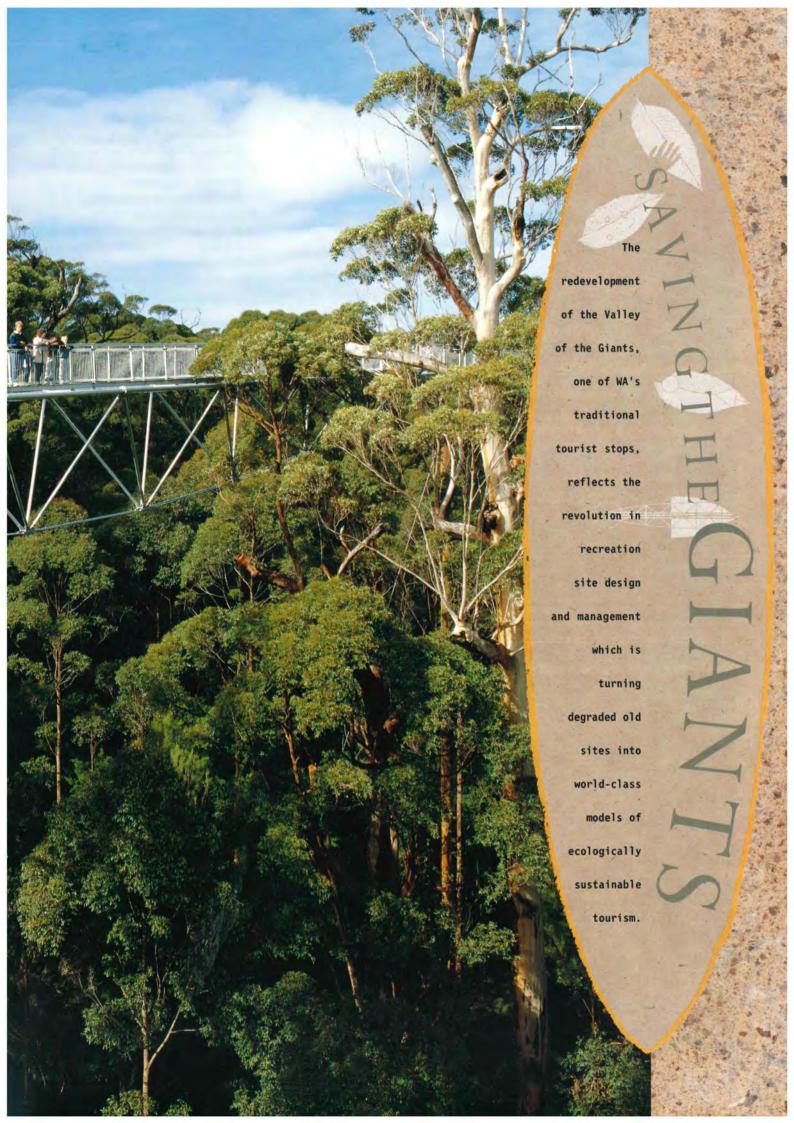
The world's tallest hardwood tree. The tallest hardwood trees in the world are Australia's own mountain ash - Eucalyptus regnans. The tallest existing specimen is found in Tasmania and measures a towering 90.1 metres. But even this is small next to the tallest mountain ash on record. This tree grew in Victoria and was measured at 132.6 metres tall in 1872. It's listed in the Guinness Book of Records.

A single Australian tree covers a whole hillside and is more than 10,500 years old. An unusual stand of Huon pine has recently been found in Tasmania and is believed to be one of the world's oldest living organisms at over 10,500 years old! The one hectare patch is made up of a single tree with a thick tangle of roots, stems and branches. Over the centuries snow has gradually bent boughs into the soil where they had taken root. The new branches became stems that allowed further expansion.

An Australian wattle is becoming a valuable new food crop. Traditionally Australian Aborigines used the seeds of some wattles for food. These same wattles are now being grown in Africa for wood and shelter. The trees are prolific seeders and can be used for food particularly in times of famine.



Did you know that Australia grows the world's largest hardwoods the mountain ash. Here's Tasmania's tallest specimen.





wenty years ago, no tour of the South West was complete without a photograph of the car parked in the giant hollowed out tingle tree in the forest near Nornalup. Visitors to the well-known picnic site called the 'Valley of the Giants' could follow a little path, etched through the dense understorey bush, which would reveal another dozen or so big tingle trees. There were also some with burnt out hollow bases creating black caves beckoning a look inside, and other distorted trunks bearing lumps and 'eyelike' scars, which took on the eerie appearance of aged human faces. This near mythical experience was a highlight for the modest numbers of visitors seeking the South West forest experience.

In the 1970s, visitors had these bush attractions to themselves, or might have shared the experience with a few other families during the busier periods around Christmas and Easter. At that time, Perth was scarcely more than a staging post on the international flight path, and the



expense of domestic airfares and long distances by road kept many eastern states people holidaying in their own territory. Only a few thousand people, most of them Western Australians, visited the Valley each year. But a well-kept secret seldom stays so for long, and eventually the area was to crack under growing visitor pressure.

Through the 1980s, a growing international profile for WA, the deregulation of domestic air travel and, perhaps more importantly, the surfacing of the Eyre Highway across the Nullarbor brought about a dramatic change in visitor numbers. In 1989, the annual

number of visitors to the Valley had risen to around 100 000 and was still increasing. The carpark had expanded uncontrollably to resemble a gravel football oval. The quaint trail to the other 'giants' had become a labyrinth of 'goat tracks' leading to every big tree in the area. The bark on the trees had become polished by millions of exploring hands, and the vital nourishing layer of humus around their trunks had disappeared. For the huge tree, which had been the main attraction, the end was nigh. Years of people and vehicles trampling around its base had compacted the root zone and

Previous page
Walking in the crowns of tingle and
karri trees. The Tree Top Walk is one of
the key features of the Valley of the
Giants redevelopment.

Below: The view from the top. Looking down from the highest point of the Tree Top Walk onto leafy understorey and emerging younger trees of the tingle forest. Photos – Michael James



strangled its nutrient supply. In 1990, the giant collapsed. The Valley was being visited to death.

At the time, the Valley of the Giants was part of State forest. The Department of Conservation and Land Management's (CALM) 1987 Regional Management Plan recommended that Giants block (which includes the Valley of the Giants) be included in the adjacent Walpole-Nornalup National Park, which occupies a unique high-rainfall corner of Western Australia with spectacular landscapes of estuaries, forested hills dissected by rivers, and dramatic coastal scenery.

Work began on a management plan for Walpole-Nornalup National Park in 1990. The plan involved studies of visitor patterns and preferences in the Walpole area, and it was no surprise when surveys echoed the general trend of people wanting more from their visits to the forest-more information and interpretation, more facilities, more activities. Meanwhile, the numbers of visitors to the Valley continued to increase to around 140 000. At one time during the Christmas-New Year period of 1990-91, more than 50 cars were crammed into the carpark, along the access road and even in the bush itself. It was clear that urgent action was needed to rescue this piece of WA's natural heritage.

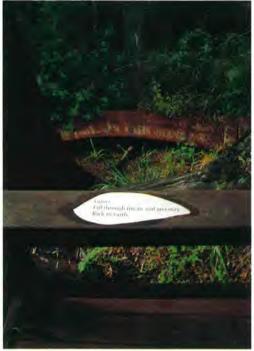
Executive Director Syd Shea holidays each year at Walpole with his family. After visiting the Valley of the Giants, Dr Shea was equally concerned about the condition and

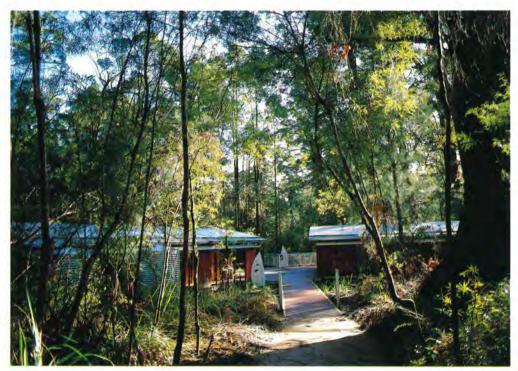
health of the site and, particularly, with the fact that little was being offered to the many coach-loads of visitors that were still turning up there. When he returned to Perth, Dr Shea suggested that CALM should investigate the possibility of building a treetop walk, similar to one he had seen in Malaysia, when attending a forestry conference there.

TREADING THROUGH THE TREETOPS

Walpole-Nornalup National Park has three species of tingle tree—including the red tingle (Eucalyptus jacksonii),







Top left: Quaint but unsustainable. For decades the novelty of being able to park a vehicle inside a tree was an attraction for visitors to the old site. The tree eventually succumbed to the constant compaction around its root zone and collapsed.

Photo – Battye Library

common in the Valley—which grow only in the Walpole area, as well as the red flowering gum (E. ficifolia) that also occurs closer to the sea. The 1990 management plan emphasised the need for urgent protection from soil compaction for the trees in the Valley. It

Top right: The leaf-shaped signs in the Ancient Empire are an innovative feature of the redevelopment.

Above: The Tingle Shelter houses the information boards, administration office, souvenir shop and toilets.

Photos – Michael James

was suggested that the old site be closed and a new one be opened in a second, recently discovered grove of big trees about a kilometre away. But this idea did not address the issue of soil being trampled by visitor pressure. Instead, it simply moved the problem elsewhere.



A project team was formed to address the problems at the Valley. When the team examined Dr Shea's suggestion of using elevated walkways to protect the giant tingle trees, they found a surprising fillip. Similar structures in rainforest in New South Wales and Queensland were attracting enough tourists to support commercial ventures, which in some cases subsidised park management.

A business plan was drafted and it became obvious that a treetop walk had the potential to generate enough revenue to subsidise the development and management costs of many other visitor facilities in the region. The creation of a Left: Mid-way along the Tree Top Walk, visitors are surrounded by the sights, sounds and scents of the forest canopy.

Below: Begining at the Tingle Shelter, the walkway rises gentley so that people in wheelchairs and children in strollers can be pushed along it. As the valley falls away, they are soon winding their way through the canopy.

Photos – Michael James

treetop walk in the Valley of the Giants could minimise visitor impact on the forest, provide exciting new tourist experiences and help pay for park management, all at the same time.

A master plan for the Valley was drafted by CALM staff from the local district and regional offices and the Recreation and Landscape Branch in Perth. Other features were proposed for the 'new-look' Valley, which included a visitor orientation and information area, interpretation of the forest system, and access for wheelchair users, making the experience memorable and instructive.

FINDING A SITE

It soon became obvious to the

planners that the tired old giants of the original site would not provide much of a treetop experience, as most of them did not have tall trunks and crowns. After carrying out helicopter surveys, the team located a group of big tingle trees with trunks and crowns intact, just a few hundred metres north of the original site. So dense is the tingle forest understorey that, despite hundreds of thousands of visitors passing nearby, these 'new giants' had remained a secret. After weeks crossing the new area on foot, at times having to crawl on all fours through the thick bush, the



Right: The boardwalk of the Ancient Empire had been carefully designed to protect the tree roots, while forming a sculptural element within the forest.

Below: The Tree Top Walk and the Ancient Empire provide a range of challenging sensory experiences.

Below right: Before the protective boardwalk was constructed at the Ancient Empire, the ground surrounding this amazing tree was bare and compacted. Photos – Cliff Winfield

planners were confident: this was the site for the treetop walk.

But other visitor facilities had to be planned for as well. The new Valley would have to accommodate a number of types of visitors, and provide a range of activities and experiences. For example, statistics from the original site showed that more than half of the visitors came in tour coaches, which stopped for a quick look, while during peak periods, many people were looking for family walktrails and barbecue facilities. Meanwhile, the new Bibbulmun Track-the long-distance walktrail from Perth to Albany-would now pass right through the Valley of the Giants, bringing in low-impact bushwalkers seeking a wilderness experience.

With an underpinning philosophy of minimising disturbance to the bush, the master plan had to meet this range of needs while including a treetop walk, a visitor orientation centre, the old giants, other walks, a carpark to fit 50 cars and six coaches, and a safe access road. Between the proposed treetop walk and the old giants, a gathering point, to be called the 'Tingle Shelter', was planned so that the entire area, except for a discovery trail, could be accessible by people using wheelchairs.

THE NUTS AND BOLTS

By far the greatest challenge in the new development was the task of designing and building a treetop walk without damaging the main attraction—the bush itself. CALM decided to hold a design competition for the 'Tree Top Walk' and the Tingle Shelter, and set out forty strict criteria. Designers had to produce a plan that created little disturbance to the forest environment, minimised any long-term impact on the bush and ensured visitor safety was paramount. And they had to meet strict aesthetic standards as well, creating a structure that was sculptural, with





attention to scale, form, line, colour and texture that would enhance the forest setting rather than stand out from it.

Some 40 entries were received from around the world. From these, four syndicates were commissioned to provide detailed, accurately costed proposals. These submissions were then assessed against the design criteria by a panel that included members of the Royal Australian Institute of Architects, the Australian Institute of Landscape Architects and the Institution of Engineers, Australia. The winning design came from Donaldson and Warn, Architects, leading a team that included engineers Ove Arup and Partners, environmental artist David Jones and quantity surveyors Ralph and Beattie Bosworth.



The design for the Tree Top Walk featured six lightweight bridge spans, each 60 metres long and four metres deep, supported between guyed pylons. The steel trusses rose slowly on a 1:12 grade over terrain that falls to a deep valley. Eventually the bridge spans reached a height of 40 metres above the creek bed.

A prototype was constructed by WA-based company Future Engineering and Communication, and was carefully tested for flexibility and choice of decking material. The trusses were then prefabricated before shipment in sections no longer than six metres. The short and relatively light sections were easily transported to the Valley and bolted together on the ground before being



hoisted into position, minimising site disturbance and creating a walkway that, remarkably, only occupies about three square metres of forest floor.

All manner of aesthetic and practical considerations have been made by the winning designers. The form of the trusses mimics the natural form of sword grass, a predominant local plant species, while the pylons resemble the tassel flower. The modular construction of the bridge spans allows for simple future additions to the structure, making the potential for growth and enhancement of the Valley experience a practical option. And the low incline of the bridge spans enables access for people in wheelchairs making the treetop experience available to everyone.

INTERPRETING THE TINGLE

Another challenge facing the planners was interpretation. The Tree Top Walk might alleviate the pedestrian pressure on the forest floor of the new giants, but the problem of protecting the old giants from being loved to death remained. Structures and interpretive material would be needed to keep the experience of the veteran trees available, while protecting them from further harm.

Part of the fascination with the tingle forest is the strange, almost primordial appearance of trees with trunks like contorted faces—the stuff of fairy tales. In fact, the tingle trees *are* caught in a botanical time warp of sorts. Research suggests that tingles were much more widespread during a past wetter era.

After many thousands of years of diminishing rainfall, their distribution has contracted to just a few thousand hectares around Walpole. Their invertebrate tenants have made an even more remarkable journey through space and time. At one point, the Australian continent was joined to Antarctica, India, Africa and South America as the supercontinent Gondwana. This empire of continents broke up and drifted apart some 50 million years ago, but the legacy of the union are Gondwanan relict species such as the tingle spiders, snails and the ancient peripatus, which is a living link between worms and anthropods. Based on the theme of the lost era of Gondwana, the more than 400-year-old giants have been given the title 'Ancient Empire', and the interpretive planning accents this.

Rowena Howard, a landscape architect, was contracted to design an interpretive experience, using boardwalks and hardened paths, to explore the science, fantasy, intrigue and grandeur of the old trees. The project has been designed in three sections, two of which have attracted funding from the Commonwealth Department of Tourism as a site of national tourism significance. The first is a universally accessible

Natural art. The designers were influenced by the shapes and colours of the tingle forest. The form of the Tree Top Walk is strongly influenced by the tassel flower, while the pylon colour mimics tingle bark.

Photo – Michael James

boardwalk (with wide paths, stable surfaces, no steps, and no grades over 1:14) to one of the most popular of the gnarled veterans. The second stage is a mixture of boardwalk and stabilised earth path, which winds in and out, up, over and through seven more giants. The path serves a dual purpose. For the young and the fit, it is a discovery trail, while the contemplative visitor can make use of interpretive stops, scattered along the way, with seats and inspirational poetry sculpted into metal leaf structures.

A proposed third stage, called 'Seven Levels of Intrigue', is an extension of the first stage, and aims to heighten visitors' senses to the sounds, textures, colours and forms of the forest. This stage will be built some time in the future, funded by revenue from the Tree Top Walk.

The Tingle Shelter, Tree Top Walk, Ancient Empire, other forest walks and the link to the Bibbulmun Track have all helped recover the tingle forest from a downward spiral. The modern, multi-faceted facility offers a sensitively designed interpretive and educational experience to visitors of all ages and abilities, with an element of environmentally sustainable adventure. Through careful planning and a touch of ingenuity, the Valley of the Giants has been transformed from a moribund curiosity to a vibrant, state-of-the-art, nature-based tourism experience that will delight and inform generations to come. And a major flow on will be the economic benefits to the Denmark and Walpole districts, stemming from what is destined to become one of Australia's tourism icons.





The Ancient Empire and the Tree Top Walk are both accessible to people in wheelchairs. Photo – Cliff Winfield



This interpretive panel, which stands near the start of the Tree Top Walk, is one of many examples of the leaf-shaped motif used extensively throughout the Valley of the Giants. Photo – Michael James

VALLEY OF THE GIANTS PROJECT

FOR CALM:

Executive Director Dr Syd Shea

Project Director Jim Sharp

CALM Planning Team

Tracy Churchill, Cliff Winfield, Gary Muir (1994), Bill Cuthbert (1995/96), Greg Mair, Kevin Vear

Landscape Architect and Interpretive Designer - Ancient Empire Rowena Howard

Construction Project Leader Bill Cuthbert

Valley of the Giants Operation Manager Christine Wrench



The Tree Top Walk, through the crowns of giant tingles. Photo – Michael James

TREE TOP WALK AND TINGLE SHELTER DESIGN TEAM:

DONALDSON & WARN, ARCHITECTS

Geoff Warn - Principal in Charge Jane Bennetts - Project Architect

OVE ARUP Structural Engineers
Adrian Roberts - Engineer in Charge

DAVID JONES Environmental Artist

CONSULTANTS:

RALPH AND BEATTIE BOSWORTH

Bruce Greenwood - Quantity Surveyor

HARDING AND McDONALD

Bob McDonald - Hydraulic Consultant

FOWLER SURVEYS

Paul Fowler - Land Surveying

STUMPFELL SHAW

Andrew Stumpfell - Graphic design

MAIN CONTRACTORS:

FUTURE ENGINEERING AND COMMUNICATION

Tree Top Walk fabrication and erection

FOLKES SMITH AND ASSOCIATES

Pylon supply

THORNTON BUILDING CO

Tingle Shelter construction

ABBEY CONSULTANTS

Road engineering

Road engineering

SILVER BROOK PTY LTD

Road and car park construction

KEVIN LODGE

Road and car park engineering supervision

DENMARK MINIDIGGERS

Stabilized earth paths

P J & VM THOMPSON

WYNN-TAYLOR CARPENTRY

Ancient Empire boardwalk construction

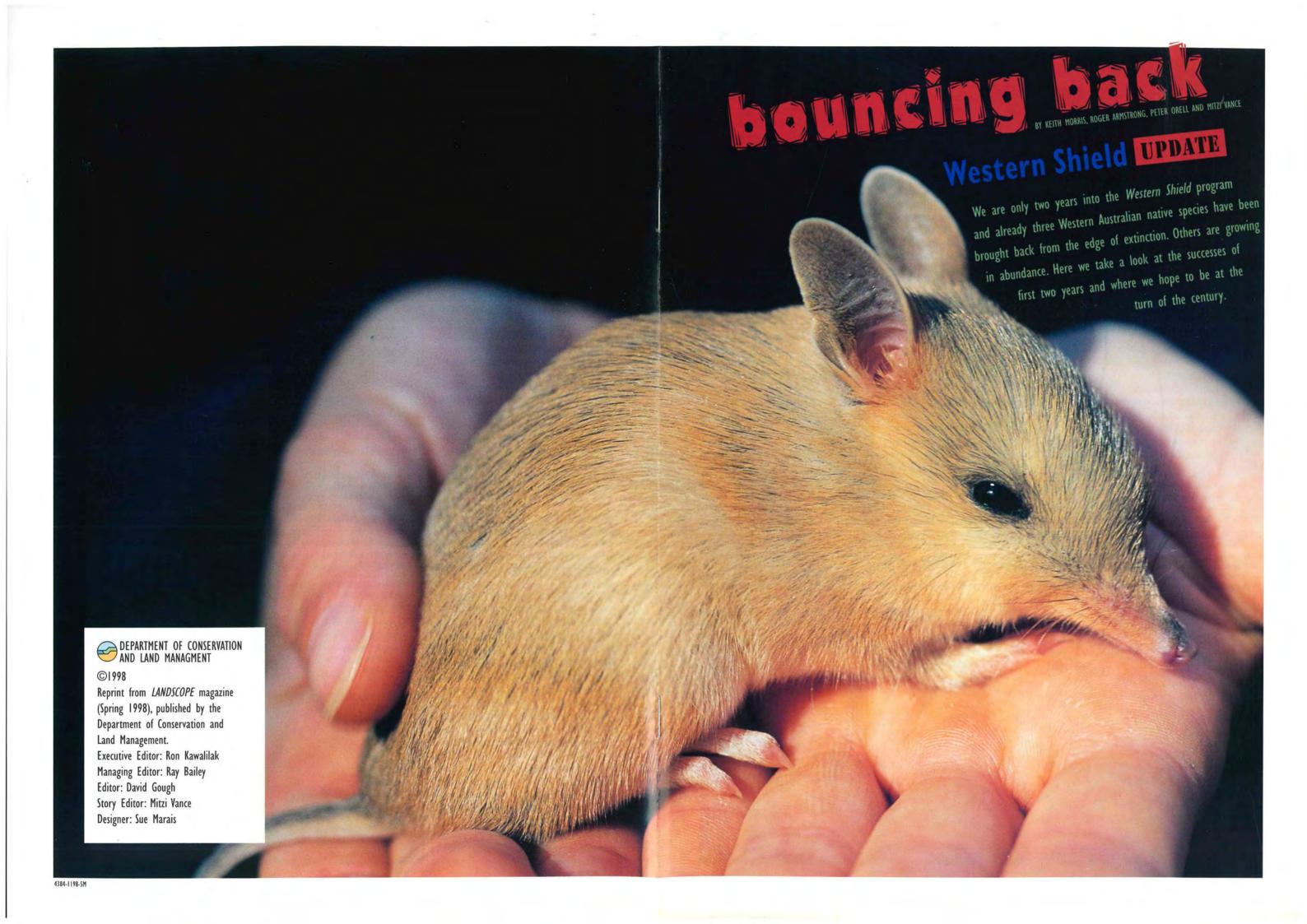
COMPAC MARKETING

Signage

JILLIAN HARRIS CONSULTING

Interpretive text





ince 1996, Western Australia has made significant advances in native fauna recovery under the Western Shield program. When the program began, the aim was to capitalise on the two great natural advantages we have to reconstruct the native fauna of the State. The first of these is the ability to control feral predators with 1080 poison baits, without harming nontarget species. The second is the presence of populations of threatened mammals on island nature reserves, in south-west forests and remnant vegetation, which provide the founder animals for captive breeding programs and translocations. These advantages have enabled the Department of Conservation and Land Management (CALM) to reverse the decline of many of our native animals by controlling introduced predators, the European fox and feral cat. Two years into the program, three native species have been brought back from the brink of extinction and removed from threatened fauna lists. Several other species are also

Previous page Western barred bandicoot. Photo – Max Lawrence

Below right: The introduced European red fox has wreaked havoc on our native fauna.

Photo - Dennis Sarson/Lochman Transparencies

Below: Dried meat injected with 1080 toxin is an effective form of fox control. Photo – Max Lawrence

increasing in abundance and CALM hopes to recover at least 13 fauna species by the end of the century.

THE SCIENTIFIC APPROACH

The backbone of *Western Shield* is the groundbreaking scientific research undertaken by scientists in WA.

In the 1960s, scientists in the then Department of Agriculture discovered that the native Gastrolobium plants in the south-west of WA contained the same '1080' poison that had been manufactured years previously as a rodenticide. In the early 1980s, scientists at the Agriculture Protection Board discovered that most native animals in the south-west had a tolerance to 1080 as they had evolved in presence of the poisonous the Gastrolobium plants. However, introduced species, such as foxes and rabbits, were highly susceptible to 1080 and so it was possible to manufacture poison baits that killed introduced pests, but did not harm native species. CALM scientists then demonstrated that abundances of several mammals increased in numbers when fox control was implemented.

In 1994, with funding provided by Alcoa of Australia, CALM embarked on Operation Foxglove, the first broadscale baiting program in the northern jarrah forest. Approximately 550,000 hectares of the forest was baited, and this provided the opportunity to research the most effective frequency of baiting.

The results of this work have suggested that baiting six times a year on the perimeter of the forest is optimal for fauna recovery, while four times a year in the central areas of forest is adequate. The woylie and chuditch have both benefited from this work and are now widespread throughout the northern jarrah forest. Another significant result was the finding of quokka populations in swamps near Dwellingup and Jarrahdale. This was a species that had declined significantly on the mainland over the last 50 years.

This research in the northern jarrah forest was the seed for the Western Shield initiative—the biggest wildlife recovery project ever undertaken in the world. Under Western Shield, CALM now aerial baits four times a year over more than 3.5 million hectares of conservation lands throughout the State, from Cape Range in the northwest to Cape Arid in the south-east. More than 770,000 baits are laid each year.

Control of feral cats is far more difficult and a major research program is under way at Peron Peninsula (see *LANDSCOPE*, Summer 1998) and other arid parts of WA. Until feral cats can be controlled effectively, *Western Shield* will remain focussed in the south-west of the State.

CAPTIVE BREEDING-THE KEY

Many of the native wildlife species that Western Shield aims to recover





now occur at very low population levels in the wild—some only occur on one or two offshore islands. Their numbers need to be increased in captivity before they can be reintroduced into areas where foxes and cats are being controlled.

A number of captive breeding programs have been established to support Western Shield reintroductions. At Kanyana Native Fauna Rehabilitation Centre, bilbies (Macrotis lagotis) and marl (Perameles bougainville) are being bred, while at Perth Zoo, chuditch (Dasyurus geoffroii), numbat (Myrmecobius fasciatus), dibbler (Parantechinus apicalis), wopilkara or greater stick-nest rat (Leporillus conditor), djoongari or Shark Bay mouse (Pseudomys fieldi) and western swamp tortoise (Pseudemydura umbrina) breeding programs have been under way for some time. Recently, CALM has established captive breeding facilities at Peron Peninsula and Dryandra forest to breed the bilby, marl, boodie (Bettongia lesueur), mala (Lagorchestes hirsutus), banded harewallaby (Lagostrophus fasciatus) and malleefowl (Leipoa ocellata). Another CALM captive breeding facility was established at Two Peoples Bay Nature Reserve near Albany to breed the critically endangered Gilbert's Potoroo (Potorous gilbertii).

RETURN TO THE MAINLAND

Two of WA's most threatened mammals have been brought back onto the WA mainland, after being absent for more than 80 years. The banded hare-wallaby originally occurred throughout the semi-arid parts of south-west of WA, while the mala was distributed across large areas of central WA, Northern Territory and the far north-west of South Australia. Both species now have only very restricted ranges in the wild; either on island nature reserves that are fox and cat free, or in predator-free enclosures.

Thirty banded hare-wallabies, 18 boodies and 47 marl or western barred bandicoots, have been taken into captivity at Peron Peninsula and Dryandra from Bernier and Dorre Islands in Shark Bay, while 30 mala, or rufous hare wallabies, from the Tanami

Right: The woylie has been removed from threatened fauna lists as a result of fox control and translocations.

Photo – Anne Storrie

Below: Trapping is an effective way of controlling feral cats.

Photo – Jiri Lochman





Desert have been moved into captivity at Dryandra. Another 20 mala will be moved to Peron Peninsula later this year. In addition, CALM staff also captured marl and boodies at Bernier and Dorre Islands and moved them to the captive breeding facilities at Dryandra. Numbers of animals will be increased by breeding in purpose-built compounds before being released at sites in the Wheatbelt and Goldfields regions and on Peron Peninsula.

Thirty mala were also flown in early June from the Tanami Desert, in the Northern Territory, to feral predator-free Trimouille Island, off the coast of Western Australia (further details of to be revealed in a future *LANDSCOPE* story). This, together with the captive breeding programs at Peron and Dryandra, is a significant step forward in re-establishing the critically

threatened mala in parts of its former range.

FAUNA RECOVERY BY REINTRODUCTION

Once feral predator numbers are under control and sufficient numbers of animals are available either from captive breeding or in the wild, the slow and careful process of restoring threatened native mammals can begin. Comprehensive research is undertaken to determine the most suitable species and the best release locations throughout the State. Over the last two years, fox control and captive breeding has made it possible to reintroduce many native animals into areas where they once thrived. In addition to these reintroductions, fox control has led to significant increases in populations of animals that were already present, but

at low levels. For example, in 1985, before fox control was implemented, one woylie was caught per 100 traps set at Batalling forest. In 1997, six years after fox control was commenced, more than 50 woylies were captured per 100 traps set. Previously unknown populations of native animals have also

increased. The most significant find to date has been the rediscovery in 1994 of Gilbert's potoroo (*Potorous gilbertii*) at Two Peoples Bay Nature Reserve on the south coast (see *LANDSCOPE*, Autumn 1995). Prior to that, Gilbert's Potoroo had not been recorded since 1879. At Lake Magenta Nature Reserve, the

quenda and brushtail possum (*Trichosurus vulpecula*) were 'discovered' after only 12 months of fox control.

Other areas of the State have also recorded an increase in numbers of native animals that were once very low in the wild. Euro (Macropus robustus erubescens) and echidna (Tachyglossus aculeatus) sightings and tracks are now common on Peron Peninsula, and malleefowl have also been sighted at Kalbarri National Park, Dongolocking Nature Reserve and Boyagin Nature Reserve, chuditch have been trapped at National Park Yalgorup and Leschenault Conservation Park, the first records in these coastal areas for 50 years, Recently, a Chuditch road kill was collected on Kalamunda Road near the north boundary of Perth Airport.

SUCCESSFUL WESTERN SHIELD REINTRODUCTIONS OVER THE LAST TWO YEARS INCLUDE:

western ring-tail possum (Pseudocheirus occidentalis) to Lane Poole Conservation Park, Yalgorup National Park and Leschenault Conservation Park.

Thevenard Island form of the Lakeland Downs short-tailed mouse (Leggadina lakedownensis) to Serrurier Island.

malleefowl to François Peron National Park.

woylie to Francois Peron National Park, the Hills Forest, Julimar Conservation Park, Lake Magenta Nature Reserve and parts of the northern jarrah forest.

chuditch to Lake Magenta Nature Reserve and Cape Arid National Park.

onumbat to Mt Dale forest and Dragon Rocks Nature Reserve.

onoisy scrub-bird (Atrichornus clamosus) into jarrah forest near Harvey.

quenda (Isoodon obesulus fusciventer) to Dongolocking Nature Reserve, the Hills Forest, Leschenault Conservation Park.

(Macropus eugenii) to Batalling Forest.

western swamp tortoise to Twin Swamps Nature Reserve.

Measurements are taken of all the animals used in captive breeding programs.

Photo - Peter Speldewinde



Echidna numbers are now increasing at Peron as a result of fox control. Photo – Dennis Sarson/Lochman Transparencies

QUENDA & TAMMAR WALLABY DELISTED

Recently, the quenda and the tammar wallaby were removed from the State's threatened fauna list as a result of their recent recovery and ongoing management under the Western Shield program. Their removal followed a review by the Threatened Species Scientific Committee, using criteria established by the IUCN (World Conservation Union), and they now join the woylie, which was removed from the State, national and international lists in 1996.

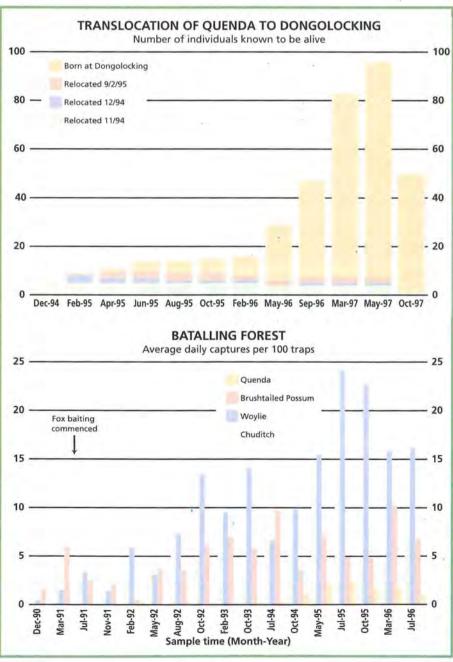
Quenda are found throughout the south-west of the State and now exist in high numbers where fox control is in place. In the jarrah forest, at Batalling and Kingston, quenda trap success rates have increased more than five-fold since the introduction of fox control. Quenda population recovery has also been achieved through animal relocations. At Dongolocking Nature Reserve, 24 quenda were reintroduced in 1994—this population has now grown to around 200 animals.

Tammar wallabies are found in several locations in the south-west and on some offshore islands, including Garden Island near Rockingham. Tammar wallabies have responded rapidly to fox control and are now increasing in abundance at several locations such as Perup Nature Reserve, Dryandra and Batalling. Fox control at Tutanning Nature Reserve has resulted in a 20-fold increase of tammar wallabies since 1984.

EAST FOLLOWS WEST

WA's success with wildlife recovery has prompted conservation agencies in other States to implement similar programs. In New South Wales, there have been discussions about the development of an 'Eastern Shield' program, and fox control is now being considered as a major fauna management strategy in Victoria. In South Australia, fox control is now being implemented more widely and several threatened species such as





greater stick-nest rats and bilbies are being translocated to areas where foxes are controlled.

Genaren Hills Sanctuary in NSW, with the support of the NSW National Parks and Wildlife Service, has sought advice and expertise from CALM, as well as a number of woylies for translocation. Twelve woylies from Dryandra forest were flown to NSW in

April for reintroduction at the sanctuary. CALM staff trained Genaren Hill Sanctuary staff prior to the translocation in the handling, caring and monitoring of woylies.

COMMUNITY INVOLVEMENT

One of the major reasons for Western Shield's success has been the support of the community and private landowners. In the past three years, local communities have been extremely cooperative and understanding about the necessity to bait for introduced predator control. Community-based liaison between local community groups, CALM District offices and Agriculture WA, has resulted in local involvement and support.

Catchment groups, Land Conservation District Committees (LCDCs) and Bushfire Brigades have participated in baiting programs to protect agriculture values and wildlife values on farms.

Many residents in regional areas have also taken an avid and enthusiastic interest in predator control and been keen reporters of animal sightings. landowners have embarked on baiting programs on their own properties, especially those with land adjacent to or near conservation estates. In some areas, the participation rate of farmers exceeds 90 per cent. For example, coordinated community baiting in the Jerramungup area, in the Wheatbelt, has been instrumental in the increased sightings of brush wallaby (Macropus irma) on farms and remnants of vegetation. Gnowangerup-Borden LCDC and the Malleefowl Preservation Group coordinate community baiting over more than 100,000 hectares, including a CALM nature reserve, which has resulted in an increase in malleefowl breeding activity and survival. The Malleefowl Preservation Group not only encourages farmers to bait land areas, it also assists CALM in malleefowl captive breeding programs by helping to locate nests and monitor populations in the wild. The North Central Malleefowl Preservation Group coordinates an annual baiting exercise in which more than 100 farmers bait almost 300,000 hectares of farmland and remnant vegetation in the Dalwallinu and Wuben areas to protect malleefowl.

The Stirling and Wellstead LCDCs undertake baiting over 20,000 hectares adjacent to Stirling Range National Park for rabbit and fox control, which has contributed to an increase in sightings of quenda, brush wallabies and groundnesting birds, such as the banded lapwing, on their farms. Landcare





Above: Harewallabies and bandicoots being transferred by helicopter to the Peron captive breeding facility. Photo – Max Lawrence

Left: The bilby is one of the mammals that will benefit from Western Shield. Photo – Jiri Lochman

Below: The captive breeding enclosure at Dryandra will breed animals for release into the Wheatbelt region. Photo – Jiri Lochman



groups in the Peel Harvey area have put out 2,000 egg baits annually for the past three years to control foxes on their properties, while farmers in the Boyup Brook area have regularly baited 44,000 hectares to protect their lambs and their wildlife.

Likewise, local government authorities have played an important role in helping CALM facilitate its baiting programs.

The war against 'killing machines' has also been greatly helped by corporate sponsorship from Alcoa of Australia and Cable Sands WA Pty Ltd. Other organisations who have also offered valuable support include West Australian Petroleum Pty Ltd, Apache Energy, ACI Plastics Packaging, Crop Care Australia, Selleys Chemical Company, Coles Myer Ltd and Shell Australia.

EDUCATION – THE KEY TO THE FUTURE

The Western Shield project does not stop at feral predator control and wildlife recovery. An important part of the project's success is the education of young Western Australians on the importance of our native wildlife for future generations. To this end, CALM has created the Western Shield Action Pack for upper primary school students, which encourages awareness of the conservation of WA's native fauna species.

The pack provides teachers with four ready-made lessons on WA's threatened native animal species and includes teacher's notes, resource sheets, activity sheets and suggestions for extension activities that all link to primary school curriculum subjects of Society and Environment, Science, Mathematics and Language. The Western Shield Action Pack and excursions have proved to be an excellent way to encourage and promote awareness in children about our native wildlife, the partnerships between flora and flora and WA's environment. As a result of these experiences the number of students that understand the impact of feral predators on our wildlife soared from 59 to 81 per cent. The interest in conserving threatened animals also increased from 55 to 89 per cent.

WESTERN SHIELD FACTS

- Aerial baiting utilises a twin-engine aircraft operating at an altitude of 150 metres and 300 km/h. Baiting operations continue for more than six weeks each time, four times a year.
- 132,000 kilometres flown per annum, this is equivalent to 3.3 times around the world.
- Baiting covers 3.4 million hectares; which is equivalent to 53 per cent of the land area of Tasmania.
- The aircraft utilises a Global Positioning System (GPS) and specialised navigation software to locate the aircraft within 30 metres of its true position.
- Baits are laid at 200-metre intervals along parallel flight lines one kilometre apart resulting in five baits per square kilometre. A red light indicator prevents baits being laid outside the baiting target. The location of every bait leaving the aircraft is recorded. The aircraft flight track and bait locations are down loaded and plotted after each operation.
- 770,000 baits are laid each year (including aerial and ground baiting operations).
- Baits are laid four times per annum over the majority of the baited area, although smaller reserves are baited more frequently (monthly) by hand.

BANKSIA ENVIRONMENT AWARD

CALM's innovative approach to fauna recovery recently won the Banksia Environmental Award for flora and fauna conservation. Run by the community-based Banksia Environmental Foundation, the Banksia Awards were launched 10 years ago and have become Australia's most comprehensive environmental awards.

The award is tangible recognition for the thousands of hours spent by hundreds of

people during the first two years of the Western Shield program. Several major battles have already been won resulting in three native animals being taken off the threatened species list. The next two years should see that number increase. And if we are successful, the future looks very good indeed for many Western Australia's native animals.



In WA, the rufous hare-wallaby, or mala, is now restricted to two islands and two captive locations at Peron and Dryandra.

Photo – Marie Lochman

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reenhouse gases occur naturally and are part of our climate system. Water vapour, carbon dioxide, methane, nitrous oxide and others in the atmosphere absorb heat rising from the Earth's surface and then radiate some of that heat back towards the ground. Greenhouse gases have been increasing their concentration in the atmosphere because of human activities, such as burning fossil fuel and land clearing and there is a concern that this 'enhanced' greenhouse effect will result in global warming. The carbon dioxide (CO2) concentration in the atmosphere is 30 per cent higher than it was 200 years ago.

Increasing concerns about the impact of rising concentrations of greenhouse gases on the world's climate, and the failure of nations to adopt, voluntarily, practices that would reduce emissions, led to an international agreement in Kyoto in December 1997 for developed countries to adopt legally binding greenhouse gas reduction targets. The so-called Kyoto Protocol requires developed countries to achieve a collective target of a five per cent reduction in emission from 1990 levels, by the 'first assessment period', which is 2008-2012. Australia was successful arguing that because of the nature of its economy its target should be eight per cent greater than its 1990 levels. Nations are required to show that they have made significant progress towards achieving their targets by the year 2005.



Nations that ratify the Protocol will be required to determine their net greenhouse gas emissions (emissions minus carbon dioxide absorbed to sinks like trees) in 2008 and 2012 in order to calculate their average annual net emission between those years. Australia's net emission level must not be more than eight per cent above its 1990 level. However, our national target cannot be quantified at this stage because the 1990 base year emissions have not been finalised. But if it is assumed that Australia's greenhouse gas emissions were the equivalent of 500 million tonnes of carbon dioxide, we will have to keep our increases in emissions below 40 million tonnes per year by the year 2012.

This will be a challenge because of the energy-intensive nature of our economy. For example, in 1995, Australia's

emissions (excluding emissions caused by clearing vegetation) were already six per cent above the 1990 emissions. If proposed resource development projects in Western Australia proceed on schedule, their greenhouse gas emissions, using current technology, alone would probably exceed the eight per cent growth target allowed for the whole of Australia.

The Kyoto Protocol allows for carbon dioxide emissions to be offset by activities that absorb carbon dioxide. This means that nations can develop a national accounting system for carbon—the carbon 'balance' each year will be determined by the difference between the amount of carbon dioxide emitted and the amount absorbed into sinks. The Kyoto Protocol specifically recognises that activities such as afforestation absorb (or sequester) carbon dioxide. Thus, these activities can be used to create sinks and gain 'carbon credits'. This, together with the articles in the protocol that provide for

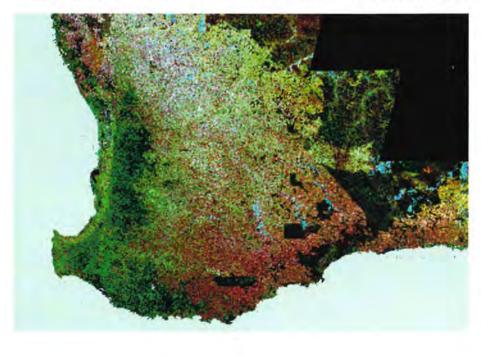


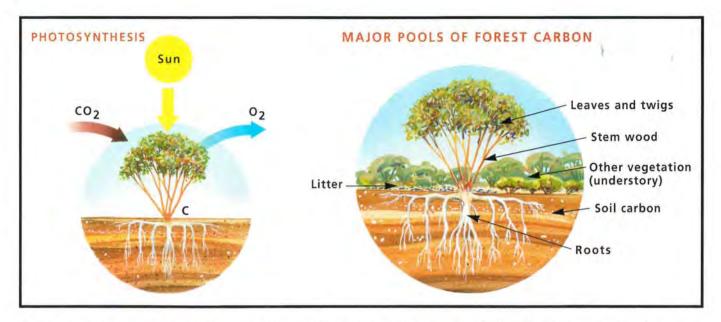
The amount of carbon sequestered in a tree is related to the dry weight of the whole tree. This means measuring not just the timber, but also the roots, branches and leaves.

Photo – Gary Hartnett

Above: Rows of maritime pine—more than half-a-million hectares have been assessed as suitable for this tree crop. Photo – Michael James/CALM

Left: Satellite images of Western
Australia's south-west land division
show just how much land has been
cleared for agriculture. It is estimated
that more than three million hectares are
potentially available for tree crops and
landcare plantings.





trading of carbon emissions and carbon credits, has focused attention on the use of tree crops and vegetation rehabilitation as a means to offset some of the carbon emissions. While the carbon accounting rules are still being finalised, it is likely that sequestered carbon will have a commercial value. Despite the absence of rules there are already 'carbon markets'. Australia, and particularly Western Australia, has a significant disadvantage

Below: Soil has been dug away to expose the extensive root system of this pine. Photo – Syd Shea

Below right: Oil mallees, which are being planted on farms in the 250–400mm rainfall zone, are not yet a commercial crop. The carbon stored in their woody roots could increase their value and make it possible to plant many more trees. Photo – Chris Garnett/CALM

in achieving the Kyoto targets because of the energy-intensive nature of our economy. But we do have one significant advantage—our capacity to sequester large quantities of carbon by tree planting and vegetation rehabilitation.

CARBON SINKS

Plants use energy from the sun to convert carbon dioxide and water into simple sugars by the process called photosynthesis. In trees these are converted into the complex carbon molecules that constitute wood. One molecule of CO₂ contains 27 per cent carbon so that for every tonne of carbon that is produced by plants 3.7 tonnes of carbon dioxide are extracted from the atmosphere.

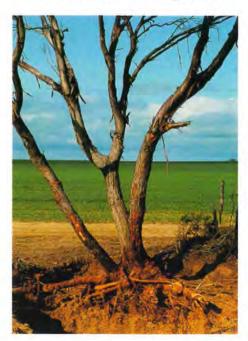
The world's forests already constitute a major carbon sink. Deforestation is one

Above: Fueled by energy from the sun, plants take in carbon dioxide from the atmosphere and extract the carbon to make sugars. The remaining oxygen molecules are released.

of the reasons why carbon dioxide concentrations have increased in the atmosphere. Theoretically, it would be possible to consume the extra carbon dioxide that is being emitted into the atmosphere by expanding forests or tree plantations. However, it has been calculated that up to 500 million hectares of new forests would be needed to sequester the 20–25 billion tonnes of carbon dioxide that is released worldwide through the burning of fossil fuels and deforestation. This is about five times the world's current area of commercial tree plantations.

One of the criticisms of using trees to

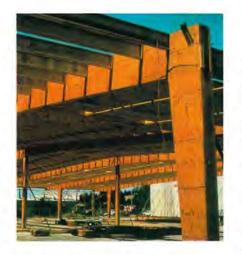




offset carbon dioxide emissions is that the effect is only temporary—even if the trees are not harvested, they eventually die and decompose, returning the sequestered carbon back into the atmosphere. If tree crops or landcare plantings are maintained by replanting, the carbon pool will continue to be maintained, although the rate of increase in the carbon pool will lessen. Many scientists argue that given the uncertainty surrounding greenhouse science, 'buying time' by sequestering carbon in tree crops would allow time to develop new or more efficient technologies, such as alternative energy sources.

Tree crop products could permanently contribute to reductions of carbon dioxide concentrations in the atmosphere if they were used to generate energy, replacing fossil fuels, and to replace products that take a lot of energy to produce. For example, replacing steel, aluminium and cement with wood products would result in a direct reduction in greenhouse gas emissions.

Recently, more attention has been given to determining the effect of sequestering carbon for different lengths



of time on global warming. The Intergovernmental Panel on Climate Change (IPCC)—the international group of expert greenhouse scientists who advise the international community on greenhouse issues-agrees that a proportion of the molecules emitted into the atmosphere have a finite life. Eventually, a proportion of the CO2 molecules emitted are absorbed into sediments in the deep oceans. The effect of offsetting the carbon dioxide emitted for varying periods of time on potential global warming, at this stage of the development of greenhouse science, cannot be quantified. Even if carbon stored in trees is eventually re-emitted to the atmosphere, in addition to 'buying time' it will reduce the ultimate global warming by an industrial emission. The longer a tonne of carbon is locked up in woody tissue, the greater the benefit.

HOW MUCH CARBON CAN TREES SEQUESTER?

One of the advantages of farming carbon is that the total biomass of the tree counts, not just the part that is suitable for timber production—in other words, the trunk, roots, branches, leaves, etc. Total biomass can be relatively easily measured for various tree species at different ages of development. This involves dissecting whole trees and weighing each of the other components-roots, leaves, branches-and determining their dry weight. It is possible to establish a relationship between easily measured tree parameters, like height and diameter, and tree biomass. The amount of carbon fixed in woody tissues is equivalent to approximately half the dry weight of the biomass.

The amount of biomass produced varies according to the tree's age—trees grow slowly at first, pass through a stage of rapid growth and then growth plateaus until it almost ceases. Eventually, the amount of carbon fixed by a forest or a plantation equals the amount of carbon released by decay and respiration.

The average amount of carbon fixed per year can be calculated by measuring the total biomass which has accumulated on a hectare and dividing by the rotation age. Another method is to estimate the average growth each year and adjust it for any material lost over the rotation

Top: New timber products, such as laminated veneer lumber, have great structural strength, making it possible to replace materials that release much more carbon into the atmosphere.

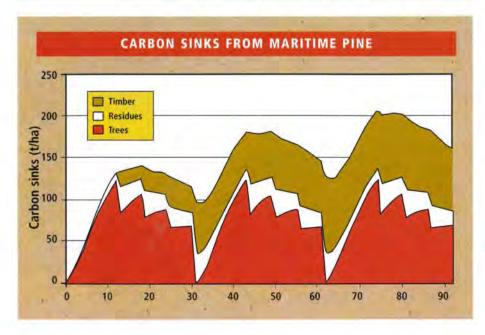
Photo – Kevin Lyngcoln

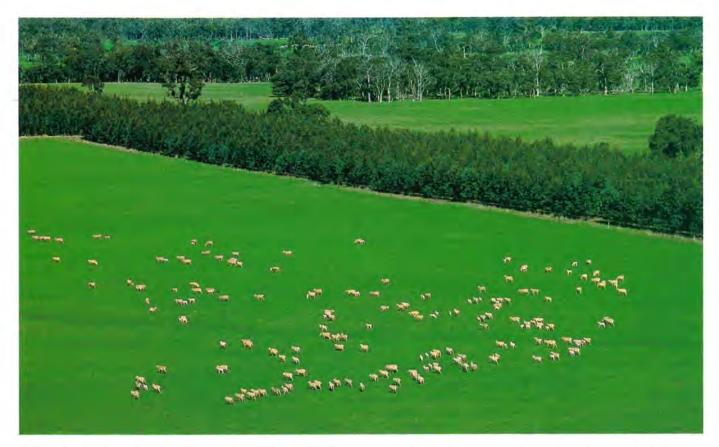
Above left: This table shows the huge variation in the amount of carbon released by different building materials. Timber is the only product that stores carbon.

Left: This graph (based on a model developed by Peter Ritson) shows predictions of carbon sinks obtained from maritime pine on one hectare which is thinned at 12, 18 and 24 years and harvested and replanted every 30 years.

CARBON RELEASED AND STORED AND FOSSIL FUEL ENERGY USED IN THE MANUFACTURE OF BUILDING MATERIALS

Material	Carbon released (kg/t)	Carbon released (kg/m³)	Carbon stored (kg/m³)	Fossil fuel energy (MJ/kg)	Fossil fuel energy (MJ/m³)
Rough sawn timber	30	15	250	1.5	750
Steel	700	5 320	0	3.5	266 000
Concrete	50	120	0	2	4 800
Aluminium	8 700	22 000	0	435	1 100 000





because of natural mortality or harvesting. Currently, the preliminary carbon accounting rules do not recognise the carbon stored in the timber products that are produced when the trees are harvested, but we are examining whether this can be changed. The carbon contained in wood products that are used for buildings or furniture may be stored for decades after the trees are harvested. One way to maximise the amount of carbon fixed on a hectare of land is to ensure harvesting occurs before tree growth declines and to convert the timber harvested to products with long lives, such as structural timber or board products. Determining how long carbon is fixed in a stand of trees is more complex, but reasonable estimates can be made of the length of time that different carbon pools (including the carbon lives of timber products made from the tree stem) of a tree remain fixed. Thus, it is possible to calculate the tonnes of carbon that are fixed per year per hectare and the average number of years that carbon remains fixed. Consequently, it is possible to estimate the number of 'tonne years' of carbon that a tree crop or other types of perennial vegetation produced each year, or the total amount of carbon stored in trees or other types of vegetation over a specified period.

In Western Australia, there is extensive data on the growth rates of the major tree species being established on farmland and in plantations. Studies are being undertaken to calibrate these measurements with total biomass production. Preliminary studies have been carried out to determine the biomass production of mallee eucalypts that are being planted in the Wheatbelt for landcare and for their potential to produce eucalyptus oil. Rehabilitating pastoral land degraded by grazing pressure from domestic and feral animals can also result in significant sequestration of carbon.

LAND AVAILABILITY

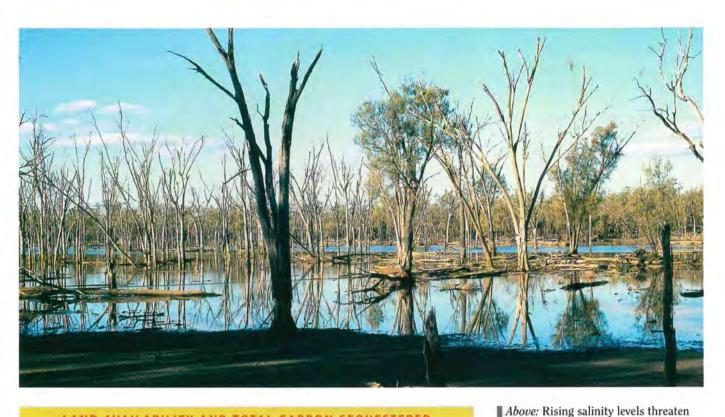
One of the principal constraints on using trees to offset carbon dioxide emissions around the world is the availability of suitable land. Apart from consideration of price and productivity, the land must be secure-carbon sequestration, to be effective, must be long term—and extensive tree planting must be politically and socially acceptable. Western Australia is uniquely placed to meet these criteria because it has a large land base suitable for growing trees, legal procedures to secure land, and a large area of tree crops has already been established on farmland in partnership with farmers.

More than 120,000 hectares of tree crops have already been established on farmland in the State's south-west. Like the bluegums shown here, tree crops can be integrated with traditional agriculture and located to help protect native vegetation and reduce salination.

Photo – Jiri Lochman

The area of south-west agricultural land potentially available for tree crops and landcare planting could total more than three million hectares (out of a total area of 18 million hectares). In addition, about 10 per cent, or five million hectares, of pastoral or rangelands could be available to sequester carbon.

In the 1980s, CALM developed the 'tree crop sharefarming' scheme in association with the Western Australian Farmers Federation. Under this scheme, using a specifically designed legal contract-'profit a prendre'. Under the sharefarming agreement, a landowner can allow the use of his land for commercial tree crops, without foregoing his title to the land. The investor in the tree crop venture has secure rights to access the crop, and a sharefarming agreement is registered on the land title, which ensures security is maintained even if the property is sold. The agreement provides for the commercial returns to be shared between the investor and the landowner.



LAND AVAILABILITY AND TOTAL CARBON SEQUESTERED OVER A 30-YEAR PERIOD

Rainfall zone	Tree crop zone (mm)	Gross area (million ha)	Potential for revegetation	Projected planting area (ha)	Average carbon sequestered (tonnes/ha)	Total carbon tonnes sequestered over 30 years
> 600	Maritime pine		30%	100 000	103*	10 300 000
	Bluegum	2		250 000	49	12 250 000
	Landcare species			250 000	54	13 500 000
400-600	Maritime pine	6	25%	500 000	103*	51 500 000
	Landcare species			1 000 000	40	40 000 000
250-400	Mallee eucalypts	10	10%	500 000	31	15 500 000
	Landcare species			500 000	27	13 500 000
< 250	Pastoral regeneration	85	10%	8 500 000	5	42 500 000

* Assumes credit for carbon contained in timber products

nature conservation as well as farmland. Without urgent action, half of the region's conservation reserves will be lost including the last three remaining freshwater wetland systems. Photo – Kim Howe

Left: This table indicates the gross size of carbon sinks potentially available in Western Australia.

CALM has established more than 1,000 joint ventures with farmers to establish tree crops on privately-owned land since 1987. More than 120,000 hectares of tree crops have been established on farmland in Western Australia since 1986 by CALM and private companies.

INTEGRATING CARBON FARMING WITH LANDCARE CONSERVATION AND TIMBER PRODUCTION

It is impossible to determine what the returns from farming carbon will be because, currently, there is no official market price for a tonne of carbon. However, some analysts predict that it could be in the range of \$5–\$40 per tonne. The cost of fixing a tonne of carbon, including land costs, varies between zero (for some commercial tree crops) and \$50. Payment for carbon

credits could increase the rate of return on a tree crop by up to five per cent.

Western Australia's Salinity Action Plan, launched by the State Government in 1996, estimates that an extra three million hectares of trees and perennial shrubs will have to be established in the agricultural zone (along with other measures) to control salination at a cost of \$3 billion.

Farming for carbon credits is vet another incentive for landowners and investors to plant trees and protect native vegetation. Western Australia already has a rapidly growing program of tree crops and landcare planting on farms, spurred on by concerns about land degradation and a rising demand for timber products (see 'Tree Crops for Farms'. LANDSCOPE. Summer and 1992-93 'Halt the Salt'. LANDSCOPE, Spring 1997).

Another commercial product from tree crops, in the form of carbon credits, will make tree planting more rewarding and land rehabilitation more attainable. Potentially, tree planting and vegetation rehabilitation in the agricultural and pastoral areas of the State could sequester more than 200 million tonnes of carbon over a 30-year period, a significant contribution towards reducing the global warming potential of greenhouse gasses and a major contribution towards achieving Australia's greenhouse gas targets.

Dr Syd Shea is CALM's Executive Director. He can be contacted on (08) 9442 0325.

MEDIA RELEASE

Prime Minister of Australia, John Howard Premier of Western Australia, Richard Court

4 May 1999

REGIONAL FOREST AGREEMENT FOR WESTERN AUSTRALIA

The Regional Forest Agreement (RFA) for the South-West Forest Region of Western Australia is a balanced result for both the natural environment and forest-based industries, the Prime Minister, John Howard, and the Premier of WA, Richard Court, said today.

Mr Howard and Mr Court signed the agreement between the Commonwealth and the WA Government during a satellite hook-up between Perth and Canberra.

Consistent with other RFAs signed by the Federal Government, the WA RFA outcome is a good balance between jobs and investment and protection of important forests. It is a product of detailed scientific analysis and extensive community consultation.

The RFA increases the region's formal conservation reserves by 150,885 hectares - 12 per cent - to bring the total area of reserves to 1,047,201 hectares.

The RFA also creates 12 new national parks, and makes a further 25 additions to existing parks.

With 45,700 hectares of old-growth forest added to existing reserves, the agreement protects two thirds of the State's old-growth forest, including 100 per cent of rare or depleted old-growth ecosystems where possible. This well exceeds the target of at least 60-per cent old-growth protection in the nationally agreed criteria for a Comprehensive, Adequate and Representative (CAR) reserve system.

By agreement with industry, there will be an immediate reduction in the level of jarrah and karri sawlogs cut to sustainable levels, verified by a panel of independent experts.

Industry will benefit from 20 years of resource security, removal of export impediments, the marketing advantages coming from RFAs, and a \$59 million timber, tourism and regional industry development package to help forest-based industries exploit new opportunities. The package includes \$41.5 million for the timber industry in grants and interest subsidies to increase value-adding and downstream processing, to install new equipment and technology, expand local manufacturing and to facilitate adjustment by businesses in the timber industry.

\$17.5 million has been provided for development of tourism facilities and strategic tourist roads in the region.

The package will focus particularly on the Nannup, Pemberton and Manjimup region to ensure not only the maintenance of a viable timber industry, but also the expansion of the tourism industry.

Taken together with RFA security, the timber and tourism financial package will ensure that the base is laid for jobs growth over the life of the RFA.

In fact, independent consultants have indicated that the WA timber industry has the potential to create around 500 extra jobs in the region over this period. Give the certainty provided by the RFA and the industry assistance package, Governments are confident that this will be achieved.

"The RFA will ensure that both conservation reserves and multiple-use forests in WA are among the best-managed in the world, while WA's unique timbers are put to the most profitable and innovative use," Mr Howard said.

Mr Court said the State could now plan ahead "secure in the knowledge that our forest management practices are ecologically sustainable and that the region's biological diversity and natural and cultural heritage are conserved in perpetuity".

"At the same time, we can be confident that we are getting the most from our quality timbers in high value products such as furniture and fine woodcrafts, flooring and mouldings."

Mr Court said the RFA's new reserves would help local communities to develop their tourism industries, as well as enhance the conservation reserve network.

"One significant addition to the conservation estate is in the Walpole-Denmark area where the total area of three existing national parks will be increased to create continuous formal conservation reserves extending over 215,000 hectares," he said.

"These new areas include parts of Sharpe, Collis and 15 other blocks, and will enable wilderness values in the area to be enhanced."

Conservation groups, tourism and heritage organisations, local government authorities, Aboriginal organisations, scientists and individuals identified many of the new reserves during the public consultation phase of the RFA process.

"The WA Coalition has effectively cut the jarrah sawlog intake by 45 per cent since 1993, and there has been a reduction of up to 52 per cent since 1987," Mr Court said. "However the impact of the RFA will be supported by industry development assistance and the certainty provided by the agreement.."

The RFA brings forward the reductions in resource supply that the last Forest Management Plan foreshadowed would occur from 2004. As a result the annual contracted level of jarrah sawlog cut will reduce from around 482,000 cubic metres at present to 286,000 cubic metres from 2004. As agreed with industry, the average annual jarrah sawlog cut to 2003 will be 324,000 cubic metres. The annual level of karri sawlog cut will reduce from around 203,000 cubic metres at present to 178,000 cubic metres from 2004. Average annual harvesting to 2003 will be 186,000 cubic metres.

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WA Premier: Casey Cahill 0413 153 060

Regional Forest Agreement FACTS SHEET

From Cheryl Edwardes MLA, Minister for the Environment

All State and Federal governments are committed to a sustainable forest industry and a world-class conservation reserve system

Five States have reached or are working towards an agreement with the Federal Government on the future of Australia's forests.

This future will be outlined in Regional Forest Agreements (RFA) - blueprints for the next 20 years.

The aim of all RFAs is to make sure our forests are around forever. Environmental values will be protected in a world class reserve system, the forests will be managed in an ecologically sustainable way, and there will be certainty for forest-based industries and the communities that rely on them.

In Western Australia, the details of the RFA will be spelt out in the next Forest Management Plan.

Once the RFA is signed, the Forest Management Plan will be prepared. The Plan will be released for public comment and full assessment by the Environmental Protection Authority (EPA).

Further to this assessment, the EPA will be involved in two processes to ensure sustainable wood production. First, it will participate in an expert panel to verify the level of wood yield before the RFA is signed. Second, it will be represented on a taskforce to assess forest management and timber harvest levels before the next Forest Management Plan is commenced.

In relation to old growth forest, it is important to remember that 72% of existing old growth karri and 54% of old growth jarrah is already protected from logging in National Parks, Conservation Parks and other reserves. The RFA will set aside more old growth forest in reserves (up to 100% in areas where it is rare or depleted).

Public consultation has been an important part of the RFA process. There have been open days, public meetings, workshops, 23 information centres, fortnightly newspaper updates, two internet sites and a 24-hour hotline.

As well as scientific backing, the RFA Steering Committee has had advice from key stakeholders representing 60 forest-based industries, as well as Aboriginal interests. A joint RFA discussion paper "Towards a Regional Forest Agreement" was released for public comment in May last year. It drew on 40 separate scientific projects assessing all forest uses and values — environmental, heritage, social and economic.

The discussion paper attracted 30 000 public submissions, and since it was released, State and Commonwealth Ministers responsible for developing the RFA have been taking those submissions into consideration.

A summary of submissions, describing how the agreement has dealt with key issues raised, will be published with the final RFA.

The RFA process in WA has involved more than 500 experts covering forest ecology, soil science, geomorphology, hydrology, archaeology, botany, zoology, geography, economics, social science and geology.

As a result of the RFA process, there are 46 scientific reports on the South-West forests publicly available.

Before the RFA process even began, Australia's most eminent forest ecologists developed the criteria for the forest reserve system.

Part of this process involved construction of the State's first database assessing South-West fauna – more than 76 000 records of mammals, fish, birds, frogs, reptiles, molluscs, spiders and insects from 796 species.

The WA RFA covers 4.25 million hectares of public and private land in the SW forest region. It has an estimated population of 155 000 people, including 40 000 families.

The world standard for forest conservation is 10 per cent of the currently existing area of each forest type.

The WA target exceeds this world standard and aims to conserve 15 per cent of the pre-1750 forest levels. This means we will exceed the world standard two or three times.

Less than half of one per cent of the forest available for timber production (1.2 million ha) is logged and regenerated each year.

More than one million hectares of South West forest is reserved – the equivalent of 2,500 Kings Parks or 500 000 Subiaco Ovals.

There is already a definite trend to reduce the amount of logging in our forests. The area of jarrah and karri harvested each year is about half what it was 25 years ago.

The rate of cut for the jarrah forest (sawlogs) from the existing area of State forest is planned to reduce from 490 000 cubic metres a year to 300 000 cubic metres a year in 2003. This figure will be reviewed to reflect the outcome of the RFA.

Logging contracts signed under the current management plan are not due to expire until 2003.

The RFA will be reviewed every five years to ensure it stays on target.



WESTERN AUSTRALIA REGIONAL FOREST AGREEMENT



UPDATE ON THE REGIONAL FOREST AGREEMENT FOR THE SOUTH-WEST FOREST REGION OF WESTERN AUSTRALIA

The Commonwealth and Western Australian governments are working intensively on concluding the Regional Forest Agreement for the South-West Forest Region of Western Australia (WA RFA). This circular is designed to inform you of progress in a number of areas in relation to finalising the RFA.

Public Consultation

One of the significant inputs to the Governments' work on finalising the RFA has been the public submissions received following the release of the Public Consultation Paper on the Regional Forest Agreement for the South-West Forest Region of Western Australia in May 1998. Some 30, 000 submissions were received, addressing a wide range of concerns relating to issues such as reserve design, protection of old growth forest, improvements to forest management practices and opportunities for development in forest-based industries, including the need to consider the wellbeing of forest dependent communities.

All submissions received were the subject of an exhaustive analysis which is being considered in finalising the RFA. While not every single concern raised can be fully incorporated into the RFA, the Governments are carefully considering all the issues raised, particularly in the context of delivering a WA RFA that achieves the objectives of the National Forest Policy Statement and delivers outcomes that meet the needs of the wide range of forest uses.

A report of the analysis of the public submissions will be made publicly available with the release of the RFA.

In addition to the public open days, meetings with local government bodies and interested groups, throughout the region, following the release of the Public Consultation Paper, there have also been opportunities for stakeholders to continue to raise concerns and provide views on what they consider should be the RFA outcomes. The Commonwealth Ministers for Forestry and Conservation and the Environment and the WA Minister for the Environment have conducted a number of formal and informal meetings with groups of stakeholders. Most recently the Commonwealth Minister for Forestry and Conservation, Mr Tuckey, met with sawmillers in Bunbury to seek their views on future directions for the WA sawmilling industry. Ministers or their representatives are continuing consultations with a range of other stakeholders to assist in finalising the RFA.

Timing

Both the Commonwealth and Western Australian Governments are committed to an early completion of the WA RFA. To achieve this a number of steps have to be taken, including:

- finalising the Comprehensive Adequate and Representative (CAR) Reserve design;
- consideration of possible Industry development components of the RFA;
- consideration and agreement to the full range of legal and policy issues that will form the WA RFA;

- the provision of statutory environmental and heritage advice which the Commonwealth must consider prior to signature of the WA RFA: and
- completion of the summary of public submissions.

At present, work is progressing towards a possible signing of the WA RFA by the Prime Minister and the Premier in March 1999.

The Agreement

In relation to the contents of the WA RFA, the broad directions being taken in relation to the main elements of the Agreement are (i) the development of a scientifically based Comprehensive, Adequate and Representative reserve system in accordance with the Nationally Agreed Criteria for the Establishment of a Comprehensive, Adequate and Representative Reserve System for Forests in Australia (JANIS criteria); (ii) Ecologically Sustainable Forest Management (ESFM); and (iii) providing the conditions necessary for internationally competitive forest-based industries) are set out below.

CAR Reserve System

Under direction from Ministers, the Steering Committee has developed a range of options for the CAR Reserve System taking into account the approaches outlined in the Public Consultation Paper and the public submissions received. These options are currently being analysed and refined against a number of objectives, including the JANIS National Reserve Criteria and industry and community socio-economic objectives.

The final option developed by the Governments will be one that delivers a sound environmental outcome, while taking into account industry and social objectives including, the need to provide a sustainable resource base for the timber industry and to minimise or avoid economic impacts on other industries important to the Western Australian economy, such as mining.

Ecologically Sustainable Forest Management (ESFM)

The Assessment of Ecologically Sustainable Forest Management in the South-West Forest Region of Western Australia Report by the independent expert panel was delivered to governments for their consideration in November 1997. It contained 44 recommendations on how the experts considered the WA forest management system could be improved. Governments have broadly accepted these recommendations and the outcome will form a substantial part of the WA RFA, addressing such issues as:

- improvements to forest management practices, including increased monitoring and reviewing of these practices to deliver continuous improvement;
- increased transparency in forest management;
- increased recognition and consideration of Indigenous interests in the management of forested areas; and
- incorporation of heritage issues in forest management in a more holistic manner.

The RFA will also address the issue of sustained timber yield. In order to provide a sustained yield figure for the WA RFA, Commonwealth Ministers and the WA Minister for the Environment have agreed to establish a panel of independent experts to verify the output from the calculation of the sustained timber yield figure once the new land base from which timber production will be allowed is finalised.

Industry Development

Industry Development is being considered in parallel with the development and analysis of options for the CAR Reserve system. Consideration is focussing on two elements:

- mitigation of any potential impacts of the CAR Reserve System; and
- initiatives and support which will provide an enhanced and vibrant forest-based industry sector in Western Australian.

Conclusion

Copies of the WA RFA, following signature by the Prime Minister and the Premier, along with a supporting information package, will be made available to you. Commonwealth and Western Australian officials will conduct full briefings for stakeholders and communities on the WA RFA outcomes.

Attached for your information is a list of all available RFA assessment reports.

Catharine Masters

Calharine Mastes

Senior Adviser

Forests Taskforce

Department of the Prime Minister and Cabinet

Luwan

Alan Walker RFA Manager

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Management





JOINT STATEMENT

Commonwealth Minister for the Environment, Robert Hill Commonwealth Minister for Primary Industries and Energy, John Anderson Western Australian Minister for the Environment, Cheryl Edwardes

COMPREHENSIVE REGIONAL ASSESSMENT RELEASED FOR WA REGIONAL FOREST AGREEMENT

The Regional Forest Agreement (RFA) for Western Australia's South-West forest region comes a step closer today with the release of a detailed assessment of the region's native forests.

Covering the environmental, social, economic, resource and cultural values of the region's native forests, the Comprehensive Regional Assessment (CRA) Report provides the information base for the development of an RFA between the Commonwealth and State governments.

The RFA will be a 20 year plan for the use and management of the region's forests.

The RFA will aim to protect the environmental values of native forest in a Comprehensive, Adequate and Representative (CAR) Reserve system, ensure ecologically sustainable forest management, and promote the development of internationally competitive forest-based industries.

Welcoming the release of the assessment report today, the Minister for the Environment, Senator Robert Hill, the Minister for Primary Industries and Energy, John Anderson, and the WA Minister for the Environment, Cheryl Edwardes, encouraged all interest groups and individuals to continue to be involved in working towards a balanced and responsible RFA.

Senator Hill said the State's South-West forest region has unique biodiversity values, including important habitat for a number of endangered species. He said the region also has a wealth of natural and cultural heritage values.

"This assessment provides the scientific base for sound decisions on how best to protect all these environmental and cultural values for future generations," he said.

Mr Anderson highlighted the importance of forest-based industries to the local and State economy as well as to the regional community, and the significant amount of value adding by industry in the region.

"The economic, resource and social reports illustrate the potential for growth through sustainable forest management," he said.

"The RFA will provide the certainty that industries need to plan ahead, develop new markets and to continue to support the local community."

Mrs Edwardes said the RFA would address the important issue of adequately protecting forest ecosystems including old growth jarrah and karri forest.

"The aim is to develop a balanced outcome that will protect the region's environment and heritage values as well as providing a secure future for industries and communities."

The Ministers stressed that participation by stakeholder groups and by groups and individuals in the local communities was central to the success of the RFA process.

They encouraged all those interested in the development of the WA RFA to read the assessment report and learn more about all aspects of the forests.

The CRA report will be followed by the release of a public consultation paper for the RFA which will be widely circulated.

During that period there will be RFA information days in the region for local communities to study the information available. Maps and scientific data will also be publicly available at 23 information centres throughout the South West and in Perth.

The information days will be advertised in local and regional media.

FEBRUARY 6 1998

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6 February 1998

CRA boost for biodiversity

Knowledge of Western Australia's plant and animal life has been given a boost during compilation of the Comprehensive Regional Assessment (CRA) released today as part of the Regional Forest Agreement for the South-West forests.

The CRA examines the natural, cultural, social, resource and economic values in the forests of the South-West. Part of this involved carrying out assessments of the region's biodiversity.

The assessment was undertaken at the ecosystem as well as species level, providing the best insight yet into the diversity of life in the South-West forest region. Extensive flora and fauna databases were developed for the RFA process.

More than 153,000 flora records covering 3,244 plant species came from a range of sources both within and outside CALM. The RFA region was found to contain 462 plant species of conservation significance, 43 of which were declared rare. The preparation of interim recovery plans for 36 endangered or vulnerable plant species will be addressed in the implementation of the RFA.

The database built to assess the South-West forest region fauna was the first large-scale animal database ever compiled in WA. It captured more than 76,000 records of mammals, birds, frogs, reptiles, molluscs, spiders, fish and insects across 796 species.

The region has 123 terrestrial and aquatic animals of conservation significance. Of the nine endangered species identified, six have recovery plans for their protection and the preparation of interim recovery plans for the remaining three will be addressed in the implementation of the RFA.

The CRA mapped 27 ecosystems within the region, including 11 jarrah forest and six karri forest ecosystems. Estimates of the pre-1750 distribution for each of these ecosystems were prepared and will be used in assessing the current level of reservation and additional reserves which may be required to meet the nationally agreed criteria for a Comprehensive, Adequate and Representative (CAR) reserve system. Three ecosystems were found to have less than 15 per cent of their original distribution in reserves. These are the vegetation of the Darling Scarp and the jarrah forest of the Leeuwin-Naturaliste ridge and Mt Lindesay areas.

Detailed mapping of more than 300 vegetation complexes within the 27 South-West forest ecosystems was also produced for the Assessment.





Another element included the identification of areas important for the richness and diversity of flora, including the Leeuwin-Naturaliste ridge, the Blackwood River plateau, the south coast, and to a lesser extent the Darling Scarp east of Perth. More than 1,900 plant species were used to develop the models.

Media Contact: Alan Walker (08) 9442 0300

Catharine Masters 0419626028



6 February 1998

CRA Identifies Extensive Old Growth

Nationally agreed criteria used in the WA RFA process have provided the basis for the mapping of 347,303 hectares of old growth forest in the various forest ecosystems of the region. Of this, 202,942 hectares -or 58.4 per cent - is currently protected in existing and proposed reserves.

The Comprehensive Regional Assessment (CRA) which forms the basis of the RFA process was released today. As well as assessing old growth, the CRA looked at biodiversity, national estate, wilderness, world heritage, social values, forest resources, forest-based industries and ecologically sustainable forest management in WA.

The nationally agreed operational definition of old growth forest is *forest that is ecologically mature* and *where the effects of disturbance are now negligible*. Interpretation of this definition varies when applied to forests with different ecological characteristics. In Western Australia's case, this means that separate methodology has been used for karri (wet forest) and jarrah/wandoo (dry forest) assessments.

Disturbances considered in the mapping of old growth in WA include: past clearing for agriculture; logging; symptoms of *Phytophthora cinnamomi* - dieback infection; clearing for mining; and grazing. Fire has not been included as a key disturbance because of the fundamental role it plays in the normal dynamics of karri and jarrah forest, and the fact that all mature forests have been subject to many fires.

In the karri forest, maps of growth stages were overlaid with maps of past disturbance to determine old growth. All areas of uncut jarrah forest, as well as uncut wandoo forest and woodland were included as old growth.

Areas that were not eligible include jarrah forests where regrowth from past selective logging had persisted in the canopy, areas known to be affected by dieback, and areas where intensive mining was known to have taken place.

Private forest land was not assessed but was generally considered to be significantly disturbed and, apart from one small exception, was excluded from the old growth maps.

A summary of old growth within 19 forest ecosystems shows that six have an area exceeding 10,000 hectares (five jarrah ecosystems and one karri). The largest old growth areas are in the jarrah (south) ecosystem with 160,500 hectares, the karri (main belt) ecosystem with 53,000 hectares and the jarrah-blackwood ecosystem with 48,500 hectares. Nine other ecosystems within the RFA region contain old growth of between 1,000 and 10,000 hectares, while four have an area of old growth of less than 1,000 hectares.

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6 February 1998

CRA looks at timber production

The publicly-owned native forests of the South-West are managed under a Forest Management Plan endorsed by the State Government. This plan sets out how the forests will be managed for all their values including nature conservation, water catchment protection, tourism and recreation, science and research, heritage and culture and the production of timber and other resources such as minerals, honey, wildflowers, seeds and raw materials.

According to the Comprehensive Regional Assessment released as part of the Regional Forest Agreement process today, the South-West native forests extend over 2.45 million hectares, but only 1.25 m ha - about half - are available for timber harvesting. Other areas are set aside in conservation reserves such as national parks, nature reserves, conservation parks and special protection zones along roads, rivers and streams.

The level of the timber harvest is set by the State Government following an independent assessment of the sustainable yield of the forest. The current sustainable level is 417,000 m³ of karri (of which 214,000 m³ are first grade sawlogs), 1,360,000 m³ of jarrah (of which 490,000 m³ are first and second grade sawlogs) and 559,000 m³ of marri.

The annual turnover of the State's hardwood and softwood timber industry is estimated to exceed \$850 m with more than 20,000 people employed directly and indirectly.

Investigations undertaken for the Comprehensive Regional Assessment identified a series of probable development opportunities for the hardwood sector. These included veneer products, high-value sawn timber, secondary processing, particleboard and MDF panels and eventually pulp and paper processing.

Plantations

Western Australia had 148,000 ha of plantations in 1995, of which 58 per cent was publicly owned and 42 per cent was privately owned. The rate of establishment of hardwood (mostly bluegums) has been exponential with a combined increase of 40,000 ha in 1996 and 1997.

The Comprehensive Regional Assessment report states there are 1.45 million hectares of the area included in the Regional Forest Agreement process that are potentially available for tree planting. About 500,000 ha of this area could conceivably grow bluegums at returns that are competitive with agriculture.

CALM also has launched a maritime pine program on cleared agricultural land in the 400 to 600 mm rainfall zone. CALM's target is to establish 150,000 ha of integrated tree crops on private farmland over the next 10 years.

Media Contact: Alan Walker (08) 9442 0300 Catharine Masters 0419626028







6 February 1998

CRA snapshot of industries and people

The Comprehensive Regional Assessment (CRA) released as part of the Regional Forest Agreement (RFA) today provides a 185-page overview of WA's South-West forest area – its people, industries, plants and animals.

The CRA provides the baseline data that will show how South-West forests measure up against nationally-agreed criteria and the options available for future forest management within the Regional Forest Agreement framework.

It will be a crucial document during public consultations and State-Commonwealth negotiations over the next few months, before the signing of the WA RFA - a 20-year plan for the use and management of the South-West forests.

The RFA region stretches across 4.25 million hectares from near Gingin in the north-west to near Denmark in the south-east, and has an estimated population of 155,000 people. There are 40,000 families and 70,000 full and part-time employees living and working there.

The region supports a wide range of industries including agriculture, mining, mineral processing, manufacturing, hardwood and plantation timber milling, wood processing, recreation and tourism. These major industries contributed \$8,896 million to Western Australia's Gross State Product for 1995-96.

The South-West forests also support a range of smaller businesses such as beekeeping, floriculture, biotechnology and basic raw materials such as sand, limestone and gravel.

In 1995-96 the total farm-gate value of the beekeeping industry in WA was \$7:03 million. Exports during the period were estimated at more than \$3 million.

The WA floriculture industry was responsible for 57 per cent of the value of cut flower exports from Australia in 1992-93. The farm-gate value of local wildflower production was estimated to be more than \$7m, which included a bush-harvested component valued at \$3.7m. The retail value of total production was estimated at between \$16.3m and 17.3m.

The market value of the Perth and outer metropolitan basic raw material industry which deals in sand, limestone, lime sand, clay hardrock and gravel, was estimated at \$768m in 1994. There were 4,127 jobs directly associated with the industry.

A number of potential dam sites have been identified in the region which has 22 major river systems, as well as some high-yielding groundwater resources.





A detailed social assessment of South-West communities was carried out as part of the CRA to gain an understanding of community attitudes and interests in the forest.

Surveys and personal interviews were used to develop a social profile of stakeholder interests in the RFA region, and a forest industry assessment project surveyed industry groups.

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6 February 1998

CRA spotlight on forest tourism & recreation

The 185-page Comprehensive Regional Assessment (CRA) that will provide the basis for negotiations during WA's Regional Forest Agreement process has confirmed the importance of forests to tourism in the region.

The South-West is the only area in WA where tall forests can be found in abundance relatively close to population centres, hence their role as one of the cornerstones of South-West tourism.

The CRA found that investment in recreation and tourism assets in the RFA area had been significant. CALM had pumped more than \$22 million into recreation and tourism infrastructure, with a further \$102 million coming from private investment. It estimated that more than 4,000 jobs had been generated through tourism in the region, excluding the self-employed.

On average, 2.38 million visits a year were made to the RFA forest region in 1995 and 1996. About 5 per cent of those visitors came from overseas, 8 per cent from interstate and 87 per cent from WA.

Tourist expenditure during visits to the forests was estimated at \$250 million a year, with most of this (77 per cent) coming from WA visitors, 13 per cent from interstate travellers, and 10 per cent from international guests.

Tourism growth forecasts suggest the number of international visitors will increase 7.8 per cent a year. When this is applied over the 20-year RFA period, it can be expected that the number of international visitors to karri and jarrah forests will increase from 37,500 in 1996 to 199,000 (approximately five fold) by the end of the RFA period. Similarly, interstate visitors are expected to increase from 66,500 in 1996 to 103,000 in 2018 (two per cent annually). And Western Australian visitor numbers will grow from 297,000 in 1996 to 420,000 in 2018.

These forecasts appear to be conservative when compared with growth figures recorded by local tourist bureaux over the past six years. From 1991 to 1996, the annual increase in the number of visitors to tourist bureaux in the South-West was around 10 per cent.

In order to deal with this increase in demand, the CRA has highlighted the need for more planning to ensure effective use of existing facilities and introduction of major attractions and new facilities, as well as increased access for walking, rambling, mountain biking, horse riding and camping groups. CALM currently licenses 126 tourism operators offering a wide range of activities within State forest, national parks and other reserves in the region.

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6 February 1998

CRA focus on mining and mineral processing

The mining sector is a major contributor to the economy of the South-West Forest region.

The Comprehensive Regional Assessment reveals that in 1995-96, the mining industry generated \$2.68 billion revenue and directly employed 8118 people. About half the region has moderate to high mineral potential and is covered by State Agreement Acts and mineral tenement under the Mining Act.

The main commodities were bauxite-alumina, gold, coal, mineral sands, lithium/spodumene and tin/tantalum.

"With world class resources in bauxite, gold, tantalum, spodumene and mineral sands, it is probable that production will continue to increase to meet expanding market demand," the CRA report says.

Bauxite resources in the region are estimated at 2600 million tonnes, enough to support the industry for about 70 years at the current mining rate. Last year, Western Australia's alumina production totalled 8.2 million tonnes—almost 20 per cent of world production—valued at \$1968 million.

Collie, the only commercial coal-producing area in WA, has an estimated resource of 2.4 billion tonnes. At the existing production rate, estimated reserves would enable mining for at least 100 years. The current value of coal production is \$270 million a year.

The region's gold production in 1995-96 was 14.2 tonnes valued at \$235.4 million. Gold ore reserves are estimated at 310 million tonnes with a potential mining life of 20 years.

Mineral sands production generated \$198 million while tin/tantalum and lithium/spodumene was worth \$58 million in 1995-96.

The CRA report notes that while the direct revenue to WA from mining operations in the forest region was \$2.681 billion, the industry generated a further \$3.292 billion in indirect returns to the State and \$4.575 billion in indirect returns to the national economy. The indirect employment level as a result of the industry was 28,504 jobs in WA and 39,517 jobs nationally.

"Mining companies also make an important contribution to State revenue through direct payments such as royalties and payroll taxes and to regional revenues by employing local people and purchasing inputs from local companies," the report says.

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MEDIA STATEMENT

Federal Minister for Forestry and Conservation, Wilson Tuckey WA Minister for the Environment, Cheryl Edwardes

4 May 1999

A \$41.5 million industry development program announced today as part of the Western Australian Regional Forest Agreement will provide the stimulus to create jobs through greater emphasis on downstream processing and value adding of the State's native hardwoods.

Federal Forestry Minister Wilson Tuckey and WA Environment Minister Cheryl Edwardes said the RFA was a vote of confidence by the governments in the timber industry and the people of those south west communities who relied on the native forests for their livelihoods.

The industry development program includes the provision of grants and interest subsidies to timber mills to install value-adding equipment and new technology, to expand local manufacturing and provide assistance with marketing.

Funds also would be available for Business Exit Assistance for mills and assistance for timber industry workers who may be impacted by RFA outcomes.

Mr Tuckey said the interest subsidies could leverage up to \$40 million in loan funds to the timber industry to develop and install new technology.

The loans also would assist the industry in adjusting to whole bole logging compared with the traditional system by which logs were graded in the forest and the remains of the tree bole were left to rot or be burned.

"Whole bole logging also will help the industry meet the overall objective of 'doing more with less'," Mr Tuckey said.

"For example, Jensen Jarrah in Busselton currently uses 4000 cubic metres of jarrah a year in manufacturing outdoor furniture settings for the domestic and export markets. The company employs 70 people.

"This ratio demonstrates the fact that the timber industry, with some additional assistance from Government, can not only increase its returns from a reduced level of resource, it can create sustainable employment."

Mr Tuckey said the overall emphasis was to provide certainty to the timber industry.

"The new levels of the jarrah and karri sawlog harvest and the industry development program will provide that certainty so that timber companies can plan ahead and invest knowing that they have an assured level of supply," he said.

Mrs Edwardes said the State Government has ensured the development program contained specific safeguards to protect timber mills' investment in new technology.

This included a provision to convert loans into grants in the event the new Forest Management Plan due in 2004 further reduced the resource allocation to individual mills.

"Assistance under the development program will be available across the industry," she said.

"However the priority will be on mills that are committed to restructuring with a focus on producing high value components for locally-based manufacturers and increasing utilisation of bole logs from the forest."

The WA Government will also contribute \$3 million over the next five years to help use jarrah more efficiently through thinning of jarrah regrowth stands.

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MEDIA STATEMENT

Federal Minister for Forestry and Conservation, Wilson Tuckey WA Minister for the Environment, Cheryl Edwardes

May 4, 1999

Nannup could become the showpiece of Western Australia's new native hardwood timber industry under the Regional Forest Agreement.

The State and Commonwealth governments today announced their support for a modern sawmilling and processing facility for the town. The new facility would focus on producing high value indoor and outdoor furniture components, flooring and similar products for Australian markets and export.

The reduction in the sawlog harvest as a result of the RFA, means the existing Nannup mill owners, Bunnings Forest Products, are likely to rationalise their operations, thus creating the opportunity for a new venture.

WA Environment Minister Cheryl Edwardes said the State Government would work with Bunnings to ensure a seamless transition to the new facility.

"The industry development package announced as part of the RFA provides the opportunity to redevelop the existing mill into a complex that will use the latest downstream processing and value adding technology to supply seasoned timber to a range of users, including furniture manufacturers and craftspeople," she said.

"The concept will not only protect timber workers' jobs in the Nannup region, it will create additional employment in surrounding areas such as Busselton and Margaret River."

Federal Forestry Minister Wilson Tuckey said the proposal for Nannup would provide an impetus for other sectors of Australia's native timber industry to use new technology to concentrate on value-added products rather than the traditional construction materials such as wall studs and roofing timbers.

"Western Australia has been at the forefront in research into new downstream processing techniques for a range of native timbers," Mr Tuckey said.

"This has resulted in the development of low-cost solar-powered drying kilns and the manufacture of wood panels.

"This research will provide a further foundation on which to build a value-adding facility in Nannup."

Mrs Edwardes said the expressions of interest would be called from the private sector to develop the new mill. There already had been two timber operators interest in this exciting new venture.

A contract for 20,000 cubic metres of jarrah sawlogs would be specifically allocated to the Nannup facility. This would be derived from allocations of logs available following the exit of sawmilling businesses under the Business Exit Assistance component of the forest industry adjustment program.

The expressions of interest would seek operators committed to milling of whole bole logs and production of high value components that enhance employment in the local industry.

(Whole bole logging means that timber mills take delivery of the whole tree bole rather than sawlogs that are graded in the forest. It enables mills to make greater use of the whole tree than the traditional grading system that results in much material left behind.)

Mrs Edwardes said the plan was designed to ensure as far as possible full employment of mill workers in Nannup who may be affected by the reduction in the level of jarrah sawlogs available to the mill. The current level was around 40,000 cubic metres a year.

However, the Governments had also put in place a range of opportunities for workers who left the mill by choice or for some reason could not be employed in the new mill.

Mrs Edwardes said sealing of strategic tourist roads near Nannup would be brought forward, providing local job opportunities, and additional workers would be employed by the Department of Conservation and Land Management under an enhanced silviculture program of thinning in regrowth jarrah forests.

In the event that some workers could not find alternative opportunities, additional assistance would be available for retraining and relocation.

The State Government and Bunnings Forest Products also would work together to look at ways in which Nannup mill employees currently renting Bunnings' houses on the sawmill lease could buy these houses.

Mrs Edwardes said tourism in the Nannup region also would be enhanced by development of a major tourist attraction in the Donnelly River Valley between Nannup and Manjimup.

"The people of Nannup have suffered uncertainty during the long period of the RFA process, but they have shown great commitment to a sustainable industry and a pride in their work," she said.

"Their skills will serve as a showcase for the future of the industry in Western Australia" she said.

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Minister Tuckey Graham Hallett 0419 6884400

MINISTER FOR THE ENVIRONMENT

The Western Australian Regional Forest Agreement signed today creates 12 new national parks and results in more than 150,000 hectares being added to the State's conservation reserve system.

Western Australian Environment Minister Cheryl Edwardes said the Agreement was in line with the State Government's commitment to reserve additional areas under the RFA. This had been achieved with 1,047,200 hectares in the south-west forests being protected for future generations.

She said that more than 90 new reserves or additions to existing reserves would result in an increase of 150,885 hectares in conservation reserves.

Mrs Edwardes said this was an increase of 12 per cent in protected areas and was "greener" than the most conservation orientated outcome in the Public Consultation Paper.

"The 90 new reserves includes the creation of 12 new national parks and 25 additions to existing national parks," Mrs Edwardes said.

"This is a very significant and exciting step forward in forest conservation in this State.

"We now have more forest protected in reserves than ever before in the State's history."

The Minister said there was now a total of 232,800 hectares or 67 per cent of old growth protected in formal reserves. The total amount of old growth in all reserves is 245,500 hectares representing 71 per cent of the existing old growth.

"The creation of these national parks and reserves not only has significant conservation outcomes, but will have a very positive impact on local towns as well," Mrs Edwardes said.

"These additional national parks will help support local communities by creating tourism opportunities and jobs."

The Minister said the distribution of new national parks also ensured a wide range of forest ecosystems were well represented and protected.

All the targets for protection of biodiversity and old growth in the region have been met, except where land could not be obtained because it is private property or mining leases with pre-existing legal rights.

CALM will be responsible for managing these national parks which are planned to be formally classified within the next 12 months.

The State Government has purchased 3000 hectares of jarrah and blackbutt forest near Wellington Dam in Collie to create a significant national park extending over 4300 hectares to be known as Wellington.

Three new national parks will be created in the Margaret River region, including Yelverton (1300 hectares), Margaret River (4200 hectares) and Forest Grove (1400 hectares).

In the Walpole region parts of Sharpe, Collis and Trent forest blocks have been set aside for national park status.

The Blackwood River National Park (15,600 hectares) will be formed in the lower Blackwood Valley between Nannup and Margaret River.

Hawke Block near Pemberton - which consists of some of the State's finest karri and marri stands in the region - will also become a National Park, linking Warren and D'Entrecasteaux National Parks.

The Mundaring region will enjoy four new national parks to be known as Wandoo (43,000 hectares - of which 13,800 is new reserve), Helena (15,000 hectares - of which 8,200 is new reserves), Pickering Brook (6000 hectares) and Canning (3000 hectares).

Mrs Edwardes welcomed the RFA and said it represented a balance between conservation outcomes and jobs.

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MEDIA STATEMENT May 4, 1999

MINISTER FOR THE ENVIRONMENT

The State Government has announced a significant overhaul of the State's two conservation and forest agencies following the signing of the Regional Forest Agreement today.

The overhaul will mean that all conservation lands, including multiple-use State forests will be vested in a single State Conservation Authority and a new Forest Production Commission will be responsible for commercial negotiations for timber and other native forest produce.

A third new agency, the Forest Industry Advisory Board also will be formed to advise government on issues concerning the timber industry and timber community.

Environment Minister Cheryl Edwardes said the new arrangement effectively would remove the Department of Conservation and Land Management's current native forest commercial responsibilities and ensure that forest management and the commercial operations were more transparent and accountable.

CALM would no longer retain royalties paid on timber harvested from the south west forests. These royalties would be paid to the Forest Production Commission.

"The changes effectively mean that the Government has removed any potential for conflicts of interest within CALM in its role as a conservation agency and a forest manager," Mrs Edwardes said.

The new State Conservation Authority would take over the responsibilities of the National Parks and Nature Conservation Authority.

It also would be the vesting authority for all lands currently vested in the Lands and Forest Commission and be responsible for recommending the level of sustainable production of timber from native forests and native forest royalties.

"The new authority also will be responsible for auditing the land management activities of CALM," Mrs Edwardes said.

"Its membership will be the same as the NPNCA's but be expanded to include two representatives of industries or business that use land or produce from conservation areas or State forests.

"CALM's executive staff will be able to attend meetings but will not have voting rights."

The authority would have its own secretariat and audit staff.

Mrs Edwardes said the Forest Production Commission would have a membership of seven people appointed for their experience in commercial transactions. The Minister could appoint two officers of the Public Service (excluding CALM officers) to attend meetings.

The Commission's key roles would be:

- To oversee the trade in forest produce from State native forests in the RFA region;
- To be responsible for commercial negotiations with buyers of forest produce;
- To promote the sustainable use of native forest produce;
- To administer industry restructuring proposals arising from the RFA;
- To advise the Minister on prices of native forest products, including royalties for native timber.

Mrs Edwardes said the Forest Industry Advisory Board would comprise 10 representatives of the timber industry and timber communities. A member of the Forest Production Commission would be entitled to attend Board meetings but would not have a vote.

"CALM will continue as an integrated agency responsible for activities such as nature conservation, tourism and recreation, forest management and fire control," she said.

"This will retain the economies achieved by integration including planning and land management, a regional workforce, fire management, communications, mapping, research and corporate services.

"Maintaining an integrated agency is in line with the findings of the Independent Expert Advisory Group established under the RFA process to advise on ecologically sustainable forest management.

"Similarly, the 1992 report of the Resources Assessment Commission inquiry into the forest and timber industry stated: "... a common body responsible for conservation management, both within reserves and outside reserves, is the best way of ensuring that conservation goals are met in all forest tenures..... No amount of inter-agency consultation can substitute for an institution with responsibilities for integrated forest management and conservation"."

Mrs Edwardes said she also would instigate an independent review of future management of CALM's plantation responsibilities. In the meantime, the plantations, including tree crops grown on private land under sharefarming arrangements, would remain with CALM.

This would enable the review to give full consideration to both the commercial and non-commercial aspects of plantation management in Western Australia. Aspects such as the role of plantations in salinity management and carbon sequestration would be canvassed in the review.

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Nicole Trigwell

9421 7777

REPORT BY THE EXPERT PANEL ON THE CALCULATION OF A SUSTAINABLE SAWLOG YIELD FOR THE JARRAH AND KARRI FORESTS OF WA

Brian Turner
Ian Ferguson
Noel Fitzpatrick

Consultants

REPORT BY THE EXPERT PANEL ON THE CALCULATION OF A SUSTAINABLE SAWLOG YIELD FOR THE JARRAH AND KARRI FORESTS OF WA

Dr Brian Turner Professor Ian Ferguson Mr Noel Fitzpatrick

EXECUTIVE SUMMARY

As part of the RFA process in southwest Western Australia, a panel of three scientists was nominated by the Commonwealth and WA Governments to oversee the process of calculating a scientifically based provisional sustainable yield for the native forests. The panel was asked to observe and participate in the "whole of forest" yield scheduling for the jarrah and karri forests using the "final" or "near to final" land base arising from the proposed CAR reserve system; and to provide a single brief written report which comments on and evaluates the process.

We are pleased to report that following two days of scrutiny of the scheduling process we can attest that the scheduling has been carried out in an objective, professional (scientifically appropriate) and operationally realistic manner. We can also confirm that the whole-of-forest yield of jarrah, karri and marri sawlogs for the period 1999 to 2018 for the analysed reserve design is consistent with the data, assumptions and methodologies adopted in the scheduling.

We understand that the sawlog yields for jarrah and karri for the period 1999-2003 have been previously determined and accepted as transitions to the non-declining yields. Based on the scheduling runs done in our presence we recommend that the sawlog yield to be accepted as the provisional whole-of-forest sustainable yield for the 2004-2018 period be the maximum non-declining yields as shown in the table below. Depending on the adoption of a change to the rotation length for a small proportion of karri regrowth forest, this yield could increase to 178,000 cubic metres/year in the next Forest Management Plan.

Summary of recommended provisional sawlog yields in cubic metres per year

Period	Jarrah	Karri	Marri
1999-2003	324,000	186,000	78,000
2004-2018	286,000	171,000	80,000

INTRODUCTION

Background

As part of the RFA process in southwest Western Australia, a panel of three scientists was nominated by the Commonwealth and WA Governments to oversee the process of calculating a scientifically based provisional sustainable yield for the native forests. It was only possible to do this when the CAR reserve system was nearing finality, and this position was reached about April 23, 1999. The calculation of yield is a complex process involving the processing of large quantities of forest data and projecting forest statistics forward into the future for a century or so under defined assumptions.

Terms of Reference

The Terms of Reference for the panel were to:

- observe and participate in the "whole of forest" yield scheduling for the jarrah and karri forests using the "final" or "near to final" land base arising from the proposed CAR reserve system; and
- provide a single brief written report which confirms whether:
 - a) the scheduling has been carried out in an objective, professional (scientifically appropriate) and operationally realistic manner, and
 - b) the whole-of-forest yield of jarrah, karri and marri sawlogs for the period 1999 to 2018 for the analysed reserve design is consistent with the data, assumptions and methodologies adopted in the scheduling, noting that the scheduling systems have already been independently reviewed.

Personnel and Timing

The panel consisted of:

Dr Brian Turner (Chairman), Reader in the Department of Forestry at The Australian National University, who had previously conducted a review under the RFA process of the data and methodologies associated with the calculation of sustainable yields for the WA forests:

Professor Ian Ferguson, Head of the School of Forestry, The University of Melbourne, who had previously headed a panel which reviewed the ESFM implications of the RFA; and

Mr Noel Fitzpatrick, who has been Chairman of the Murray-Darling Basin Commission and Director of the Western Australian Department of Agriculture.

We were ably assisted in our understanding of the systems and processes being demonstrated by Dr Martin Rayner of the Department of CALM and the actual scheduling was done by Mr David Swain of CALM. Dr Stuart Davey of the Commonwealth Department of Prime Minister and Cabinet was present as an observer.

We were asked to conduct our enquiry over the period of two days and submit a draft of our report shortly thereafter. The panel met in the Como offices of CALM on April 23-24.

THE YIELD SCHEDULING PROCESS

Assumptions Underlying the Process

A large number of assumptions are built into the yield prediction system and these underpin the scheduling process. Many of these have been identified in other reports including Turner (1998). These were identified in the course of our review and the more important of them from the viewpoint of the scheduling process are listed and briefly described in Appendix A.

Description of the Steps

There are a number of steps involved in the total yield scheduling process. These involve the construction of databases of the areas of the forest subdivided into discrete management units, the collection of data about the forest resource through a combination of remotely sensed and ground-based data collection, the construction of growth and mortality models from various data sources, and the construction and use of simulators to predict the changes in the forest over time under a variety of management regimes. The final stage is to put together the simulated sequence of projected yields for each management unit into a time series of operations and observe the schedule of expected yields. Alternative scenarios can be examined by this processs to determine the outcome of different approaches to the management of the forests.

In the time at our disposal we could only participate in this last stage. The data and methodologies of the whole system had been reviewed earlier by the Chairman of the Expert Panel and in general had been found satisfactory for the calculation of sustainable yields. In that review various parts of the process had been demonstrated up to the point at which data needed to be passed to the schedulers.

As described in more detail in Turner (1998), the Department of CALM uses two computer programs to carry out scheduling operations. These are designed to handle the jarrah-dominated forests separately from the karri-dominated forests, because of the basic dissimilarities between the two in silvicultural systems applied, in the inventory methodologies, the growth rates of the species, and the growth rate prediction methods used. The two programs which run on remotely-accessed VAX mainframes are respectively called FORSCHED (used for the jarrah forest) and KARSCHED (used for the karri forest).

Prior to our engagement with the system, databases of the total area of each forest stratum available for harvest had been loaded into the respective schedulers. The forest strata are generated within the GIS and define areas of forest of similar species, site productivity, past harvesting operations (hence forest structure) and silvicultural condition. We had demonstrated to us how the GIS is used to produce overlays of these variables so as to spatially define the management units, how this is intersected with the boundaries of the reserve system to exclude all formal and informal reserves from the area available for timber production, and how relatively easily this can be altered to produce revised area statistics. We were able to check some parts of the near-final reserve system and verify the areas included and excluded.

In order to satisfy requirements of the 1994 Management Plan and Ministerial Conditions on forest operations, the proportion of each stratum to be harvested in different site quality classes and to meet structural goals can be specified. We were informed about these, which defined a number of "cohorts" within each stratum.

Associated with each cohort is a yield regime which specifies the expected yields per hectare by type of harvesting operation and when they are scheduled to occur. This information is based on analysis of growth plots, thinning trials and the combined wisdom of silvicultural researchers and experienced managers. Most of this information has been documented in various literature and the 1994 Management Plan. The raw data from experimental plots is usually not used exactly as observed but may be varied to improve consistency across different data sources. Regimes can be constructed (e.g., by varying rotation lengths) to create options to meet supply needs at certain times in the future. We were able to observe some of these yield regimes as specified to the scheduler.

When the areas of the formal and informal reserves were finally determined we were able to observe the process of running the two schedulers using the "final" area figures. This required linking up the appropriate area file with the yield regimes. The scheduler is a deterministic process which shows in tabular and graphical form (via a SAS program run) the total yields expected to be produced in each year for however long the simulation is run. We observed the running of these programs and how the inputs can be varied to produce different outcomes. The reasons for these are now described.

REVIEW OF RESULTS OF WHOLE-OF-FOREST YIELD SCHEDULES

A number of simulations of alternative harvesting schedules were run or examined for jarrah, karri and marri sawlogs, using the agreed reserve design. Only those which illuminate the issues are reported here. All of these simulations were based on the same annual incremental yields of timber per hectare which took into account the variation in productivity across the forest estate due to variations in rainfall, fertility, past cutting history, disease etc.

Jarrah Sawlogs

In the case of jarrah sawlogs, we were advised that, after consultation with the industry, the State and Commonwealth governments had determined that there would be a progressive reduction of supply during the period 1999 to 2003, to accommodate the probable reductions in yield. Following this advice, all simulations therefore assumed a uniform annual reduction in the yield from 352,000 m³/yr in 1999 to 300,000 m³/yr in 2003 to accommodate the changes needed in the subsequent years.

The initial simulation was based on the adoption of a general goal of a 200 year rotation, but with some minor variation to harmonise the longer term annual yield. This rotation length is not a formal requirement of the 1994 Forest Management Plan but is consistent with the other requirements concerning ecologically sustainable forest management and the maintenance of a full suite of forest values. Table 1 shows the resulting distribution of rotation lengths by areas applied.

Table 1. Distribution of rotation lengths by area

Rotation length (years)	Area under this regime (ha)	
100	14,467	
110	43,165	
120	70,113	
130	5,007	
180	8,839	
200	871,722	
220	383	

As Table 1 shows, the overwhelming majority of the jarrah forest received a 200 year rotation in this simulation. The resulting schedule of jarrah sawlog yields is shown in Figure 1. This simulation suggests that the maximum non-declining 'whole-of-forest' yield could be set at about 286,000 m³/yr based on the assumed yields and underlying assumptions. The average annual yields are summarised by periods in Table 2.

Table 2: Average annual jarrah sawlog yields by periods for 200 year rotation

Period	Jarrah sawlog yield (m³/yr)	
1999-2003	324,000	
2004-2018	287,000	
2019-2023	291,000	
2024-2028	288,000	
2029-2033	290,000	
2034-2038	283,000	
Average over 2004-2070	286,000	
Average over 2004-2100	282,000	
Average over 2004-2120	292,000	

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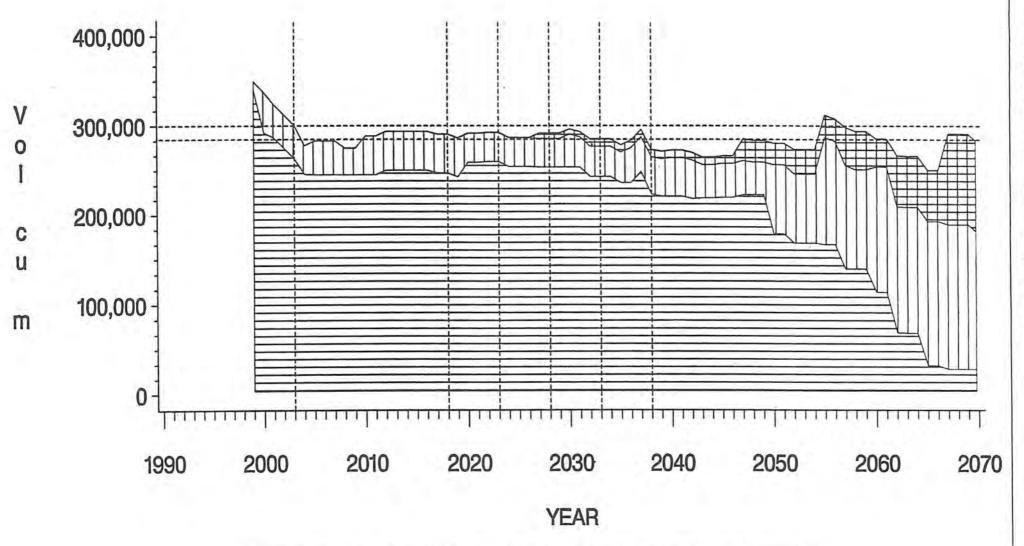


Figure 1. Simulated schedule of jarrah sawlog yields for period 2000-2070 assuming rotation length of 200 years. Horizontal hatching is mature forest, vertical hatching is existing regrowth, cross hatching is new regrowth. Note that annual variations in wood flows are smoothed in these presentations.

In the Jarrah Forest, the immediate future from 2004 to 2018 is largely controlled by the dominance of the standing sawlog volumes of mature and over-mature trees. The effect of yields from regrowth forest is small over this period, and, as Figure 1 shows, only becomes significant well beyond 2018. The simulation shows that the yield could drop below 286,000 cubic metres/year in the period 2070-2100 but this supply gap can be filled by some earlier thinning or felling of regrowth (Figure 2).

The release of the standing volume is controlled in part by the choice of rotation length, in this case 200 years. This long length is based on the 1994 Forest Management Plan's concern for other forest values besides wood production, such as biodiversity, water, and wildlife habitat. However, the rotation length could be reduced on sites of higher site productivity with little or no impact on these values. To test the effect of such a change, the simulations were re-run using a 180 year rotation for all sites of higher productivity (mainly those in areas with rainfall in excess of 900mm/yr in the central and northern forest regions). Table 3 summarises the distribution of rotation lengths by area and enables comparison with Table 1.

Table 3. Distribution of rotation lengths by area: 180 year rotation for high site.

Rotation length (years)	Area under this regime (ha) 14,397 43,148	
100		
110		
120	69,886	
130	5,007	
180	140,927	
200	738,897	
220	383	

The schedule of jarrah sawlog yields for this option is identical to that shown in Figure 1 up to the year 2070, and shows only minor variation when yields are examined out to year 2240. Obviously the impact of the change in rotation length was very small. The tabulation of average annual jarrah sawlog yields by periods for this option is identical to Table 2 for the same level of precision.

Karri

In the case of the Karri Forest, we were advised that the starting point was an immediate adjustment to 186,000 m³/yr for the period 1999-2003 inclusive.

The use of a rotation length of at least 100 years is a formal requirement of the 1994 Forest Management Plan. Hence the first simulation is based on this and longer rotation lengths (except for understocked stands assumed restocked earlier), as summarised in Table 4. Note that the area shown for a rotation of 250 years only represents that portion of the *existing* regrowth that is grown on. Under the 1994 Management Plan up to 50% of *future* regrowth would also be grown on to 150 years.

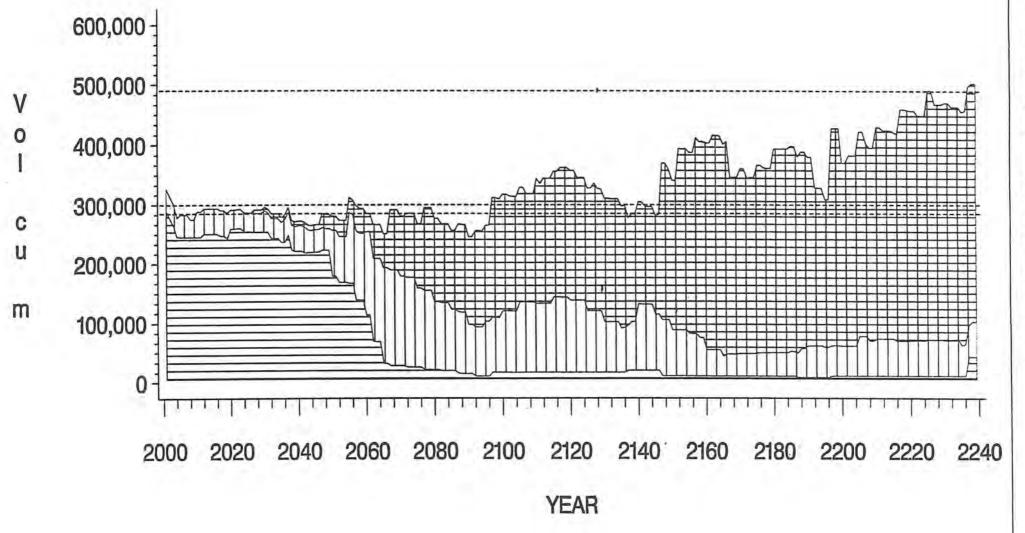


Figure 2. Simulated schedule of jarrah sawlog yields for period 2000-2240 assuming rotation length of 200 years. Horizontal hatching is mature forest, vertical hatching is existing regrowth, cross hatching is new regrowth. Note that annual variations in wood flows are smoothed in these presentations.

Table 4. Distribution of rotation lengths by area

Rotation length (years)	Area under this regime (ha)	
60	2,210	
80	2,210	
100	69,655	
250	8,972	

The resulting schedule of karri sawlog yields is shown in Figure 3.

This simulation suggests that the maximum non-declining 'whole-of-forest' yield is about 171,000 m³/yr based on the assumed yields and underlying assumptions. This is the long-term average over the period 2003-2038, after which supply levels could be expected to rise substantially. The average annual yields are summarised by periods in Table 5. Note that the marked decline in yield in the period 2023-2030 necessitates setting a lower yield in order to meet the non-declining supply requirement.

Table 5: Average annual karri sawlog yields by periods for 100 year rotation

Period	Karri sawlog yield (m³/yr)	
1999-2003	187,000	
2004-2018	175,000	
2019-2023	183,000	
2024-2028	148,000	
2029-2033	155,000	
Average over 2004-2038	171,000	

In the Karri Forest, the immediate future from 2004 to 2018 is also largely controlled by the dominance of the standing sawlog volumes of mature and overmature trees. The effect of yields from regrowth forest is small over this period but, as Figure 3 shows, becomes very significant immediately beyond 2018. In this case, the rotation length is not only important to the pattern of release of the volume in mature and overmature trees, but also to the capacity of the present regrowth forest to meet the supply in the period immediately following 2018.

However, the rotation length cannot be reduced under the 1994 Forest Management Plan requirement. This represents a serious impediment to achieving a non-declining supply. To illustrate this point, the simulation has been re-run, this time allowing some minimal variation in rotation length below 100 years in order to harmonise the yield. Table 6 summarises the resulting distribution of rotation lengths by area of forest. Note the comment made above in relation to Table 4 about the area of 250 year rotation still applies. Note also that the "Rotation lengths" are mimima rather than averages, so that the mean rotation length for the 3,537 ha under the 95 rotation length regime is actually about 102 years.

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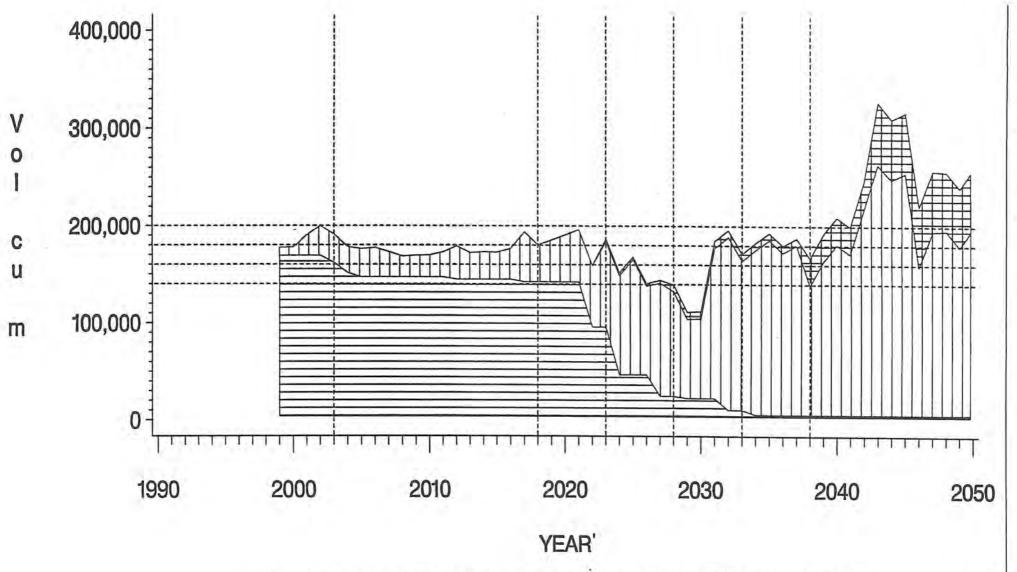


Figure 3. Simulated schedule of karri sawlog yields for period 2000-2050 assuming rotation length of 100 years. Horizontal hatching is mature forest, vertical hatching is existing regrowth, cross hatching is new regrowth. Note that annual variations in wood flows are smoothed in these presentations.

Table 6. Distribution of rotation lengths by area

Rotation length (years)	Area harvested (ha)	
60	2,210	
80	2,210	
95	3,537	
100	66,118	
250	8,972	

The resulting schedule of karri sawlog yields is shown in Figure 4.

This simulation suggests that the maximum non-declining 'whole-of-forest' yield could be set at about 178,000 m³/yr based on the assumed yields and underlying assumptions. The average annual yields are summarised by periods in Table 7. This represents a considerable improvement on the previous schedule but does not meet the 1994 Forest Management Plan of rotations lengths of at least 100 years. This requirement warrants reconsideration.

Table 7: Adjusted average annual karri sawlog yields by periods

Period	Karri sawlog yield (m³/yr)	
1999-2003	186,000	
2004-2018	175,000	
2019-2023	183,000	
2024-2028	176,000	
2029-2033	173,000	
Average over 2004-2038	178,000	

Marri

The simulated yields from marri are derived from those for the respective Jarrah and Karri Forests because it largely occurs in mixture with those species. The figures are not sensitive to the different options explored above so only one simulation is presented for each of the Forests (Table 8). The minimum total annual yield occurs in the 2004-2018 period and we suggest that this total of 80,000 cubic metres/year should be considered the maximum non-declining yield.

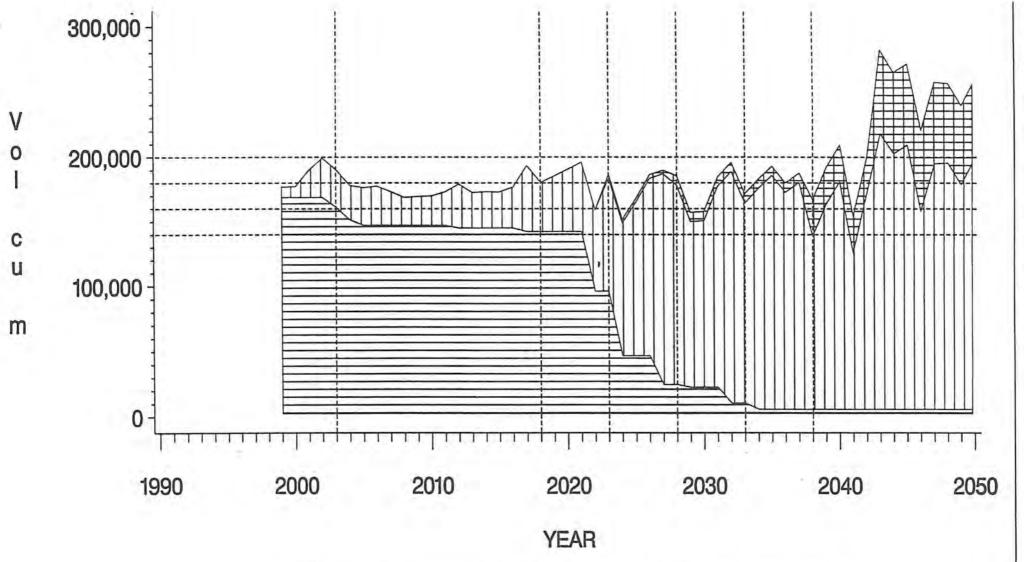


Figure 4. Simulated schedule of karri sawlog yields for period 2000-2050 assuming rotation length of 95-100 years. Horizontal hatching is mature forest, vertical hatching is existing regrowth, cross hatching is new regrowth. Note that annual variations in wood flows are smoothed in these presentations.

Period	Marri sawlog yield (m³/yr) from Jarrah Forest	Marri sawlog yield (m³/yr) from Karri Forest
1999-2003	55,000	23,000
2004-2018	58,000	22,000
2019-2023	67,000	20,000
2024-2028	73,000	9,000

6,000

79,000

81,000

Table 8: Annual marri sawlog yields by periods

OUTCOMES OF OUR OBSERVATIONS

2029-2033

2034-2038

We have been asked to confirm whether the scheduling has been carried out in an objective, professional and operationally realistic manner. We can attest that in our dealings with the CALM officers we have found that they have handled the data competently and objectively. Their scientific knowledge about the jarrah and karri forests was profound and this is reflected in the complexity of the models they have developed to simulate the state and changes of the forest over time. They were able to answer our many questions

with careful thought or immediate response depending on the type of question, or by retrieval of the information from the schedulers. They were able to respond rapidly to requests for further scheduling runs and interpret the solutions for us when needed. They had realistic views on the precision of the results of the simulation runs and were able to accept our minor criticisms of the process with equanimity and concern. We assume that the final part of our requirement asks us to verify that the results are implementable in the field. While this is harder for us to judge, it appears to us that the operational knowledge of the developers and users of the scheduling system is such that they would be able to detect any practical infeasibilities.

There is no doubt in our minds that the scheduling has been carried out in an objective, professional (scientifically appropriate) and operationally realistic manner.

We have been further asked to verify that the sawlog yields for the three species for the period 1999 to 2018 for the analysed off-reserve design is consistent with the data, assumptions and methodologies adopted in the scheduling. Our close observation of the scheduling process together with our knowledge and experience of scheduling processes in other contexts enable us to state that, as far as it is possible to test, the results of the process are consistent with the inputs to the schedulers. The several runs that we made indicate the sensitivity of the models to changed inputs and we believe that these results are consistent with reality.

Our recommendations for sawlog yields for the three species are summarised in Table 9. For the period 2004-2018 we are recommending the maximum non-declining yields as

determined above rather than the actual expected yields. However we draw attention to our analysis of karri rotation length and its influence on the non-declining yield. Depending on the adoption of a change to the rotation length for a small proportion of karri regrowth forest, this yield could increase to 178,000 cubic metres/year in the next Forest Management Plan. The marri yield is a byproduct of the karri and jarrah yields.

Table 9. Summary of recommended provisional sawlog yields in cubic metres per year

Period	Jarrah	Karri	Marri
1999-2003	324,000	186,000	78,000
2004-2018	286,000	171,000	80,000

FURTHER WORK RECOMMENDED

Although we have not been asked to comment on further improvements which could be carried out to facilitate the process of scheduling, it would be remiss of us not to do so, especially as there is to be another review process post-RFA. It appears to us that the FORSCHED and KARSCHED programs, while providing a flexible and reasonably transparent tool for calculating yield flows and examining harmonising options, is not able to examine the wide range of options which can be considered in adopting a flexible attitude towards varying times of thinning and harvest. Our limited exploration has indicated the potential benefits which might result in terms of smoothing future flows by varying rotation lengths, but the current tool can handle this in only a laborious manner. There are tools available which will automate this process (notably SPECTRUM) and we suggest that over the next review period this or some other similar tool be adopted as at least a supplement to the current schedulers. There is some loss in transparency in these mathematically more complex tools, but there is a significant gain in ability to explore options. There is also the prospect of incorporating analysis of impacts on other forest values such as water production into the scheduling process.

CONCLUSIONS

On the basis of our review, we are prepared to confirm that the scheduling process to arrive at recommended provisional 'whole-of-forest' yield levels for the period 1999-2018 has been carried out in an objective, professional and operationally realistic manner. We are further prepared to confirm that the recommended yield of jarrah, karri and marri sawlogs shown in Table 9 for the approved reserve design is consistent with the data, assumptions and methodologies adopted in the scheduling process. We assert further that the maximum non-declining yield averaged over the period 2004-2018 for jarrah sawlogs should be considered as about 286,000 cubic metres/year and for karri sawlogs as about 171,000 cubic metres/year under current silvicultural assumptions. We further note that the yield for karri could be raised to 178,000 cubic metres if some stands were to be permitted to be harvested at slightly shorter rotations than the approved 100 years.

REFERENCE

Turner, B.J. 1998. An Appraisal of Methods and Data used by CALM to Estimate Wood Resource Yields for the Southwest RFA Region of Western Australia. Cwlth & WA RFA Steering Committee. 36pp.

APPENDIX A. Constraints, Assumptions and Inputs

The Forest Management Plan

The estimates of yields were made on the basis of achieving the objectives of the 1994 Forest Management Plan including the Ministerial Conditions associated with that plan.

Technology and Specifications

The calculations assume there is no radical change in either the technology which would increase the conversion rate into saleable product, or the product specification during the period under consideration

Ecologically Sustainable Forest Management(EFSM)

The need to protect water resources, biodiversity considerations, wildlife habitat considerations all of which impacted on rotation length were considered in developing the base data set for the calculations.

Reserves

The formal and informal reserves proposed under the RFA were subtracted from the area available for harvest.

Other Exclusions

Roads and landings were excluded from yield calculations. Wildfire is allowed for on the basis of a reduction in the area harvested of 0.1% for jarrah and 1% for the more firesensitive karri.

Forest Strata:

Jarrah

In the assessment of jarrah yield the forest is divided into 522 strata within which there are up to 6 cohorts.

The 522 strata derive from classifying the forest according to tenure, the regional location (northern, central or southern or sunklands), rainfall (less or more than 900mm), productivity as measured by height, history of cutting, current structure, or whether it is mined.

The 6 cohorts relate to silvicultural guidelines and dieback. These are: thinned, gap creation, shelter wood, temporary exclusion areas (TEAS), selective harvest and dieback. Dieback is incorporated on the basis of the severity of infestation. Heavily infested areas are given nil yields and other infested areas are allocated yields of up to 50% of the yield of an equivalent uninfested area.

Karri

In the assessment of karri forest there are 69 strata. These relate to cutting history (unlogged, selectively cut and regenerated by year); species presence and dominance(karri, karri/marri, marri/karri, and karri/tingle). There are four cohorts considered. These are three site quality levels and the fourth is the senescent group which is to be grown on to 250 years.

No growth in sawlog volume is included in the yields scheduled from the mature jarrah and karri forests. Regrowth areas are allocated a growth rate based on the growth of permanent sample plots in relevant areas.

Forest Inventory

The overall forest inventory is based on many years of work; initially through on-ground measurements and subsequently using more sophisticated techniques. The most recent assessment in jarrah is based on surveys carried out in 1988 though 1991. Assessments were made of selected plots (30 000) from a helicopter and 3000 of these were measured from the ground. Sawlog volume was estimated with a sampling error of 4.6% (95% confidence level). The jarrah inventory has not been updated for growth over the intervening period in view of the slow growth rates.

The most recent karri inventory assessment was between 1977 and 1983 on the basis of line transects at 400 meter intervals. The karri inventory has been updated on the basis of actual yield data from harvest plots

Rotations

The rotation for jarrah regrowth was set generally at 200 years and for karri at 100 years (in accordance with the provisions of the 1994 Forest Management Plan). In the case of the shelterwood prescription a general addition of 20 to 40 years was made to allow for delay in establishment. There is also a second cut in the shelterwood prescription at the time the regrowth was assessed as being established enough to permit removal of the shelter trees. The high proportion of shelterwood harvesting was attributed to caution in relation to the presence of jarrah lignotubers.

Armillaria, Brownwood and Brown Rot

It was assumed that there was no yield adjustment for the presence of brownwood discoloration, brown rot. or variation in *Armillaria* activity in the future. Background mortality associated with *Armillaria* was incorporated in the permanent sample plot data used to derive the yield tables.

Understocked Areas

Some understocked areas occur in the karri and jarrah forest. In the karri, these result from past regeneration practices or fire events. These areas are assumed to be harvested in 60 to 80 years.

Estimated direct hardwood timber employment

Town	Approxima emplo	te industry yment	Other CALM Royalty dependent
	Total within town	Resident within town	employment
Bridgetown / Greenbushes	210		10
Collie	75	60	10
Manjimup / Deanmill	600	560	30
Nannup	110	80	5
Northcliffe	25	50	T-
Pemberton	190	165	15
Walpole	15	15	30
Yarloop	105	60	-



Population Characteristics*

Town	Population (Total Persons)	Median Age	Growth Rate 1991 - 1996	
Bridgetown	3,125	35	6.55%	
Collie	8,636	32	-4.71%	
Dwellingup	1,158	30	33.56%	
Greenbushes	779	32	0.00%	
Manjimup	7,367	31	-1.98%	
Nannup	1,099	34	-0.54%	
Northcliffe	801	34	3.76%	
Pemberton	1,798	32	6.52%	
Walpole	517	34	N/A ^Ψ	
Yarloop	619	34	6.17%	
South West	95,739	33	10.47%	
Western Australia	1,726,095	33	8.76%	

^{*} Based on ABS postcode area data

[♥] Unable to compare due to change in postcode area.

Employment Characteristics*

Town	Full Time Employment	Part Time Employment	Not Stated	Unemployment Rate	Labour Force Participation
Bridgetown	59.6	30.4	2.1	7.8	72.3
Collie	61.3	27.0	2.2	9.4	70.8
Dwellingup	58.7	27.5	3.1	10.1	69.5
Greenbushes	70.0	23.8	2.6	5.6	70.0
Manjimup	66.4	27.0	1.9	4.7	77.8
Nannup	60.1	26.7	2.1	12.7	71.1
Northcliffe	61.2	22.5	1.8	15.1	71.4
Pemberton	65.0	31.6	0.7	3.3	77.4
Walpole	55.2	34.4	1.4	10.5	71.1
Yarloop	66.9	24.8	0	8.2	68.2
South West	60.8	29.3	2.0	7.8	72.8
Western Australia	61.5	28.4	1.9	8.1	73.4

^{*} Based on ABS postcode area data

Note: Excluding unemployment rate, all figures are based on the segment of the population aged over 15 and under 65 years of age. Unemployment is based on the proportion of people aged 15 years and over seeking work compared with the total labour force.

Estimated Range of Timber-Based Employment Impacts*

Town	Forest Region	Direct Employment Loss		% of Workforce Potentially Impacted [▽]	
		Total	Resident		
Bridgetown / Greenbushes	Central	0-76	0-65	4.0%	
Collie	Central	0-2	0-2	0.1%	
Dwellingup	Northern	0-27	Incomplete Data	6.1%	
Manjimup	Southern	0-112	0-105	3.2%	
Nannup	Central	0-56	0-41	9.2%	
Northcliffe	Southern	0-13	0-13	4.4%	
Pemberton	Southern	0-62	0-54	6.2%	
Yarloop	Central	0-30	0-17	7.7%	

^{*} Based on RFA direct employment loss estimates and ABS area employment data.

□ Does not include indirect employment effects.

Estimated direct hardwood timber employment

Town		te industry yment	Other CALM Royalty dependent
		Resident within town	employment
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Nannup	110	80	5
Northcliffe	25	50	
Pemberton	190	165	15
Walpole	15	15	30
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Nannup	60.1	26.7	2.1	12.7	71.1
Northcliffe	61.2	22.5	1.8	15.1	71.4
Pemberton	65.0	31.6	0.7	3.3	77.4
Walpole	55.2	34.4	1.4	10.5	71.1
Yarloop	66.9	24.8	0	8.2	68.2
South West	60.8	29.3	2.0	7.8	72.8
Western Australia	61.5	28.4	1.9	8.1	73.4

^{*} Based on ABS postcode area data

Note: Excluding unemployment rate, all figures are based on the segment of the population aged over 15 and under 65 years of age. Unemployment is based on the proportion of people aged 15 years and over seeking work compared with the total labour force.

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Collie	Central	0-2	0-2	0.1%	
Dwellingup	Northern	0-27	Incomplete Data	6.1%	
Manjimup	Southern	0-112	0-105	3.2%	
Nannup	Central	0-56	0-41	9.2%	
Northcliffe	Southern	0-13	0-13	4.4%	
Pemberton	Southern	0-62	0-54	6.2%	
Yarloop	Central	0-30	0-17	7.7%	

^{*} Based on RFA direct employment loss estimates and ABS area employment data.

□ Does not include indirect employment effects.



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Extract Only

National Estate Identification and Assessment in the South West Forest Region of Western Australia

A REGIONAL FOREST AGREEMENT FOR WESTERN AUSTRALIA

June 1998

Summary

This report presents the outcomes of the national estate component of the comprehensive regional assessment of the South-West Forest Region of Western Australia. It will contribute to the development of a Regional Forest Agreement for Western Australia.

As defined in the Australian Heritage Commission Act 1975, the national estate comprises:

those places, being components of the natural environment of Australia, or the cultural environment of Australia, that have aesthetic, historic, scientific or social significance or other special value for future generations as well as the for the present community.

Areas identified in this report as having potential national estate value are indicative only and are not necessarily the delineated forest areas that will be listed in the Register of the National Estate. The report documents the values that need to be taken into account in determining national estate places; the data in the report will form the basis of that determination by the Australian Heritage Commission. The data layers and indicative areas will remain indicative until they have been considered by the Australian Heritage Commission.

Over 160 areas were identified as indicative national estate areas of Aboriginal, social or aesthetic cultural value. Indicative national estate areas of natural value are identified in value maps covering natural landscapes, old-growth, wilderness, flora, fauna and natural history.

The national estate component of the CRA has greatly enhanced knowledge of the occurrence of national estate values in the forests of Western Australia. Some of the areas identified in this assessment occur within places already listed or interim-listed in the Register of the National Estate, and some places previously listed in the Register have been found not to have retained their national estate values. Places already listed or interim-listed in the Register of the National Estate will be updated in the light of the information gathered during the CRA.

It is expected that the Regional Forest Agreement between the Western Australian and Commonwealth Governments will include specifications for a jointly agreed national estate outcome in terms of both the listing of places, including a review of places currently listed or interim-listed in the Register of the National Estate, and the long-term management of national estate values in forests.

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Western Australia Comprehensive Regional Assessment National Estate Values: Indicative Areas.

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Map 8 Registered and interim-listed National Estate places Western Australian Comprehensive Regional Assessment, Other Areas of Aboriginal Social Value.

Map 9 Social value: Aboriginal

Places of Aboriginal social value identified through community heritage workshops but not documented to the level required for listing in the Register of the National Estate.

1 Introduction

There are a number of stages in the development of the Regional Forest Agreement (RFA) between the Western Australian and Commonwealth Governments. The first stage, which follows the signing of the Scoping Agreement, is the comprehensive regional assessment (CRA). Both Governments, in collaboration with experts, have been involved in a wide range of projects designed to provide the information necessary for the analysis and identification of values and the determination of possible approaches for a RFA. Subsequent stages include the integration of environment, heritage, social and economic values in the Region, the development of the public consultation paper, and the drafting of the RFA.

This report presents the results of the assessment of natural and cultural national estate values, carried out as part of the CRA, and identifies indicative areas of national estate value in the Region. The values documented in this report will be taken into account in delineating national estate places. Areas endorsed by the Australian Heritage Commission (AHC) will be interim listed in the Register of the National Estate. The interim listing of areas will then be advertised and subject to the statutory period of three months allowed for objections and public comment. It is anticipated that interim listing of areas identified through this process will occur after the Western Australia-Commonwealth RFA is signed.

Western Australia and the Commonwealth are considering other matters to ensure that national estate values in forests are identified and managed on a long-term basis. This includes an examination by a group of independent experts of current forest management practices through the assessment of ecologically sustainable forest management (copies of the report Assessment of Ecologically Sustainable Forest Management in the South-West Forest Region of Western Australia are available on the internet at http://www.rfa.gov.au). Mechanisms for the protection of national estate values and places are also being evaluated and will be considered in the development of the RFA.

1.1 THE NATIONAL ESTATE

The national estate is defined in the Australian Heritage Commission Act 1975 as:

those places, being components of the natural environment of Australia, or the cultural environment of Australia, that have aesthetic, historic, scientific or social significance or other special value for future generations as well as for the present community.

The Australian Heritage Commission's responsibility is to identify the national estate and, under section 30 of the Act, to advise the Commonwealth Government on the protection of national estate places and the potential impact on national estate values of Commonwealth decisions relating to those places. The Act also requires the establishment of the Register of the National Estate. The Register includes places of importance at a local, regional or national level. The identification and assessment of places for listing in the Register is guided by the national estate criteria (see Appendix B).

When making decisions about the use of forests that contain places of national estate significance, e.g., decisions on whether to grant woodchip export licences, the Commonwealth must consider any potential adverse effects on the national estate.

In the past, the lack of detailed information in a regional context about the national estate values of forests has made it difficult for the Australian Heritage Commission to identify and register places of national estate significance and to provide the Commonwealth Government with detailed advice about the protection of those places. The lack of information has also contributed to uncertainty for forest-based industries and for State governments about which places will be listed in the Register of the National Estate, and what advice the Commission would give on the protection of those places.

In recognition of these problems, the Commission has developed a methodology for the regional assessment of national estate values which focuses on systematic survey to identify areas of national estate significance coupled with appropriate management to protect identified values, using a regional framework as the basis for decision-making. A systematic regional approach to the assessment of national estate values ensures that information on the distribution and regional protection of values is available to provide an appropriate context for the Commission to develop its advice to the Commonwealth Government, and all stakeholders and the general community are aware of the places of national estate significance in the Region.

In providing advice on the protection of national estate values identified through CRAs undertaken for the development of RFAs, the Commission has developed a policy which recognises the implementation, through the RFA process, of the nationally agreed criteria for a comprehensive, adequate and representative (CAR) reserve system for forests (the JANIS criteria). In summary, the Commission's current policy on the listing and protection of national estate values in a CAR reserve system is that where a RFA has substantially met the various attributes and expectations of the Commission, then it is appropriate to list all places identified through the RFA as containing national estate values which are protected by reservation, by reserve management prescription, by site exclusion, by consultation processes or other measures appropriate to the value, or which are robust and not affected by timber harvesting or other off-reserve management regime or activity.

Some of the areas identified in this assessment occur within places already listed or interim-listed in the Register of the National Estate (Appendix A and Map 8). In addition to the identification of new indicative areas of national estate significance, this assessment has demonstrated that some places previously listed in the Register have not retained their national estate values. Places already listed or interim-listed in the Register of the National Estate will be updated in the light of the information gathered during the CRA.

1.1.1 The national estate assessment

The RFA process is designed to comply with a range of Commonwealth and State statutory obligations in relation to the management of forests, including the identification of and provision of advice on the protection of national estate values required under the Australian Heritage Commission Act 1975. The assessment of national estate values in the South-West Forest Region involved the Australian Heritage Commission, the Commonwealth Department of the Environment, and relevant State agencies including the Department of Conservation and Land Management (CALM), the Western Australian Museum, the Aboriginal Affairs Department and the Heritage Council of Western Australia. A similar assessment for a RFA has been completed by the AHC and Commonwealth and State agencies in Tasmania. Earlier regional assessments of national estate values, such as the AHC/CALM assessment of the Southern Forest Region and studies in East Gippsland and the Central Highlands of Victoria, were conducted by the Australian Heritage Commission in conjunction with State agencies.

Areas identified in this report as having potential national estate value are indicative only, and are not necessarily the delineated forest areas that will be listed in the Register of the National Estate. The report documents the values that need to be taken into account in determining national estate places; the data in the report will form the basis of that determination. The data layers and indicative areas will remain indicative until they have been considered by the Australian Heritage Commission. Places in the South-West Forest Region endorsed by the Commission will initially be interim-listed in the national estate. Interim-listed places will then be advertised and be subject to the statutory period of three months allowed for public comment. It is anticipated that interim-listing of places identified through this process will occur after the Western Australia-Commonwealth RFA is signed.

This assessment builds on the previous joint assessment by the AHC and CALM of national estate values in the Southern Forest Region which is within the Region covered by the RFA. Places in the South-West Forest Region which are already listed in the Register of the National Estate and those already on the interim list will be updated in the context of the information gathered during the CRA. The identification of national estate values in the Region will contribute to the development of the RFA. The RFA will include specifications for a jointly agreed national estate outcome.

Copies of consultancy reports which have contributed to the national estate assessment are available for inspection in Perth and Canberra:

Forest Science Library
Department of Conservation and Land Management
50 Hayman Rd
COMO WA

Department of the Environment
Tobruk House
15 Moore Street
CANBERRA ACT

This report has been prepared by the CRA project team including officers of the Commonwealth Department of the Environment and Western Australian Department of CALM with the assistance of a number of other agencies, organisations and individuals.

2 National Estate Cultural Values

2.1 INTRODUCTION

Cultural places of national estate significance can have aesthetic, historic, scientific or social values. Documentary and community-centred research reveals a wide range of cultural places within or related to the forests of the South-West Forest Region of Western Australia. These places are indicative of the rich and diverse history of human interaction with, and response to, those forests.

The national estate cultural studies component of the comprehensive regional assessment (CRA) has considered forest and forest-related cultural places within the study area across all land tenures. Cultural heritage places have mainly been identified on public lands. In the instances where places of indicative national estate cultural heritage value are located on private land, it is the policy of the Australian Heritage Commission to undertake detailed consultation with all relevant land owners and other parties to verify the significance of the place prior to any action being taken in relation to its listing in the Register of the National Estate. No action towards national estate listing for any places on private land identified in this report will be taken until such consultation has occurred.

Within the CRA process, the following cultural values were considered:

- places of social value (Aboriginal and non-Aboriginal):
- · places of aesthetic value, and
- places of historic value.

2.1.1 Assessing the significance of cultural heritage values

Assessing the significance of national estate cultural heritage values in a regional context is a process which begins in the early stages of place identification and documentation and ends with the assessment of places against significance indicators and the application of a threshold of significance. Specific criteria are used in the development of significance indicators and the setting of thresholds. These criteria are specified in the Australian Heritage Commission Act 1975. The criteria, together with a series of operational sub-criteria, are listed in Appendix B.

Significance indicators are used to provide an indication as to whether or not a place holds the core components of a particular national estate value. They vary across the national estate values and may include the following:

- strength of community attachment;
- size and/or extent of community demonstrating attachment;
- substantiated strong association with a particular group or groups, and
- longevity of association with a particular group or groups.

Each threshold is set in relation to the significance indicators and is specific to each value. For instance, a place may need to rank highly on three out of five significance indicators to reach the threshold of national estate significance for a particular national estate value. In other cases, a place may be highly ranked on just one significance indicator and still reach the national estate threshold. The point at which the threshold is set depends on the importance or relevance of the significance indicator to the national estate value.

The relationship between significance indicators and the national estate threshold is established through consideration of the quantity and quality of available information, through expert opinion, and through consideration of previous national estate thresholding and listing decisions.

A national estate threshold is not graded: a place will either meet the threshold or not. Places may be significant against more than one national estate criterion, although a place need only be significant against one criterion to warrant listing in the Register of the National Estate.

A regional perspective provides a much more comprehensive knowledge base for assessing places and for applying the thresholds for national estate significance.

In relation to places of Aboriginal value, it was not considered appropriate for a threshold of significance developed by people outside Aboriginal communities in the manner described above, to be applied to cultural heritage places identified by members of Aboriginal communities in the South-West without further extensive consultation. The process used to identify Aboriginal places of indicative national estate significance in the CRA process is described in Section 2.4.2.

2.1.2 Community consultation

Community consultation provides important information for the assessment of places of social significance (sub-criterion G.1) and aesthetic significance (sub-criterion E.1) (see Appendix B).

To identify and assess social (both Aboriginal and non-Aboriginal) and aesthetic values it is necessary to collect data directly from the community. This is because the criteria used to assess these values in the landscape specify that places of social or aesthetic value must be of significance to a community or cultural group.

The following considerations can provide a measure of the strength and depth of the community's attachment to a place:

- the size and extent of the attached community or group;
- the nature of the community, its history and cultural identity;
- . the extent to which community members are prepared to allow the place to change, and
- the pace of change and whether the change is in harmony with the life of the community.

2.2 PLACES OF SOCIAL VALUE (NON-ABORIGINAL)

The identification and assessment of places of national estate significance for social value in the South-West Forest Region was based on national estate sub-criterion G.I. which recognises places that have strong or special association with a community for social, cultural or spiritual reasons (see Appendix B). Following consultation with members of Aboriginal communities from the Region, a parallel project was conducted to specifically identify and assess Aboriginal social values (see Section 2.4).

Many different types of places are important to community groups for many different reasons. Often communities value a particular place very highly because of the way they use the place or the meaning it holds for them. A place significant to the community may be a place where a memorable event has occurred in the past, or a place associated with a significant recent event. It can be a built feature such as a local hall, roadway or track, or it can be a naturally occurring feature such as a rock formation, a lake, an area of forest or a single tree. Such places are considered important because they form a part of the community's identity.

The aim of the national estate social values project was to identify the range and extent of places valued by communities in the South-West Forest Region and to assess those places for national estate significance. Before the CRA, very few places having national estate social significance had been identified in the Region. In these few places, however, this value had not been identified or corroborated through community consultation: rather, it had been determined through assessment by cultural and natural environment heritage experts. The information gathered during the CRA process, which enhances our understanding of the importance of these places, will be amalgamated with existing information on places already in the Register of the National Estate.

Some places of cultural heritage value in the Region have previously been identified in the Municipal Inventory process using community-based research methods similar to that described below. However, the majority of places identified through the Municipal Inventory process are within towns, rather than forested areas. Further, in the Municipal Inventory process, identification and assessment methods varied greatly between shires which, in the context of a regional assessment of social values in the South-West, resulted in data too variable for utilisation in this project.

2.2.1 Data sources

The communities of the South-West Forest Region provided the primary source of data for identifying and assessing places of indicative national estate social value during the CRA. Individuals and representatives of a broad range of organisations came together in community workshops to identify places important to them and to provide information on why those places were important, and on their locations and boundaries. Ten community workshops were held throughout the Region. The workshops were designed, organised and facilitated by consultants (The Training and Development Group in association with Considine and Griffiths Pty Ltd. Gray, Heaver & O Connor) in collaboration with Commonwealth and State government Regional Forest Agreement (RFA) project officers.

Information obtained through the social values community workshop process was also used as a primary layer of data in the identification and assessment of places of aesthetic value in the Region (see Section 2.3.1).

2.2.2 Methodology

Identifying the range and extent of places of social value in the Region required a group-based social research method that would draw together a wide range of people willing to share their knowledge, opinions and feelings. From the range of community consultation methodologies available, the workshop method was selected as the most efficient because it could achieve a number of goals:

- involve a large number of people and maximise their input;
- cater for a wide range of community interests and perspectives;
- engage participants in identifying and expressing shared values;
- facilitate comparison between the range of places valued by a community;
- be applied in a consistent manner across the Region;
- provide results within the available timeframe;
- allow for the broad dissemination of information about the RFA generally and provide an
 opportunity for public question time with government officials, and
- consistency with methodologies used in the assessment of social value in RFA regions in other States.

Workshop locations

The choice of locations for workshops was based on a range of demographic, geographic and social information. Factors included the accessibility of workshop locations to major social catchment areas and the distance participants would be required to travel. Ten locations were selected: Armadale, Collie, Denmark, Dwellingup, Manjimup, Margaret River, Mundaring, Nannup, Pemberton and Perth.

Identifying potential workshop participants

To help identify potential workshop participants representative of a range of groups with different interests, values and knowledge about forest places of social value, numerous agencies and groups were consulted. These included those with interests in local government, business, timber industry, mining, primary industries, community service, conservation, history, tourism and recreation. People with long associations with an area were encouraged to participate, as were those with a particular interest in their local forest area.

Local community coordinators, engaged to assist in workshop implementation in each locality, also provided valuable input into this process. Their role was to identify any omissions from invitation lists and try to ensure a broad and balanced community representation at each of the workshops in

terms of interests, age and gender. Local community coordinators also sent out background information on the aims and context of the workshops to potential participants, loaned out videos on the national estate and RFA process and made themselves available to answer questions. Where possible, telephone contact was made with potential participants to further explain the project and encourage participation

Workshop design and process

Each workshop lasted from between two-and-a-half to three hours and included a number of group and individual activities designed to encourage participants to reflect on which places were important to them and to discuss their ideas with other participants. The workshops were structured into four phases.

- The first phase involved all participants in discussion about the RFA process, the aims of the workshop, the meaning of social value and the sorts of places that might have social value to communities.
- The second phase involved smaller groups of participants in compiling lists of places of possible social value through discussion and sharing of ideas.
- In the third phase participants provided detailed information (including a description of the place, its history, location and boundaries, and why it was of social value) by filling in data forms.
- In the fourth phase participants located and marked on 1:100 000 scale map overlays the boundaries of the places they had described, where known.

All workshop participants were sent a summary of their workshop and a list of the places identified. Copies of the complete documentation for the social values project have been deposited in regional centres for community use.

Identifying places of indicative national estate social value

Since not all places are equally valued by the community, places identified through the workshops were sorted and analysed to identify those places of indicative national estate social significance. This processes was undertaken in four steps.

Step 1

The first step was to sort and organise the data according to the category and location of the place. In many instances a place had been identified at several workshops, but attributed with a different name or boundary. Some places identified were a subset of a larger place which had also been identified. Such factors needed to be clearly identified to allow a clear and rigorous assessment process to take place.

Step 2

The second step involved an evaluation of the adequacy of the data for the purposes of assessment. This was done by posing three questions:

- Is the place in the study area?
- Is sufficient information provided to enable assessment of the place?
- Is social value demonstrated in the information provided?

These questions were answered by examining the data forms filled in at the workshops and by considering mapped information. In some instances, workshop participants had identified a place by name, but had provided no other information, while in others the social value of a place had not been described or only minimal information provided. In these instances, and in cases where the place identified was not in the study area, places were excluded from further consideration in the assessment process.

process.

Community values identified in the workshops, but not related to particular places within the Region,

were also not able to be considered in this assessment. For example, comments by some workshop

participants on the value they placed on the entire Region. an entire district or all old-growth forest, were too generalised and not able to be documented by workshop participants to a level sufficient to allow the delineation of areas of national estate significance through this process.

Step 3

The third step was to identify the nature of a place's social significance and to gauge the strength and endurance of the value. This was done through the analysis of responses to several sets of questions, with the answers being recorded in a matrix system.

To identify the nature of a place's social significance a series of six questions were posed. These 'significance indicators' were derived from the wording of national estate sub-criterion G.1. They were:

- Does the place contribute to the community's sense of identity?
- Does the place have educational or scientific value for present or future generations?
- Does the place represent attitudes, beliefs or behaviour fundamental to the community?
- Does the community have a special attachment to the place because of its important contribution to community life?
- Does the place have an association with an event which has had a profound effect on the community?
- Is the place a landmark or icon to the community, either tangible or intangible?

To identify the strength and endurance of the social value attached to a place further questions were posed. For strength of community association with a place, they were:

- Is the association strong for the whole community?
- Is the association strong for a large portion of the community?
- Is the association strong for a small portion of the community?

For endurance or length of community association with a place, the questions were:

- Is the association with the community long term beyond twenty years?
- Is the association with the community medium term between 10 and 20 years?
- Is the association with the community relatively recent less than 10 years?

Step 4

The fourth step in the assessment process involved the setting and application of the threshold of significance. A place was considered to meet the threshold if it had:

- a high value for any one of the significance indicators for the whole or a large portion of the community and had moderate or long-term association, and
- a high value for any three of the significance indicators for a small portion of the community, and had a moderate or long-term association.

2.2.3 Results

The social values project collected and analysed a vast amount of information with the following results:

- 95 places, including 20 large places encompassing many smaller places, were assessed as indicative places of national estate social significance (see Appendix C and Map 6);
- 165 places were unable to be assessed due to insufficient information, and
- 114 places were found not to meet the threshold for national estate significance.

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Among the places found to be of indicative national estate social significance were some that are important to an immediate community for their recreation value. The Pemberton Swimming Pool, a 91 metre-long area of fresh water created through the damming of Lefroy Brook in 1928 and enjoyed by generations since, was one such place. Others, such as Mount Chudalup, were important because of their landmark and aesthetic qualities. Some places, such as the Mundaring Weir, were important because they were evocative of the history of an area or contributed strongly to a community's sense of place,

All places identified through the community workshops have some value to the community of the Region. Among those places not identified as being of indicative national estate significance are some that could receive recognition and management through other State processes. Mechanisms by which such places can be protected are being considered as part of the RFA process (see Section 4.5).

2.3 PLACES OF SOCIAL VALUE (ABORIGINAL)

The identification and assessment of places of importance to Noongar* communities within or associated with the South-West Forest Region was primarily based upon national estate criteria for social and aesthetic value (criteria G.1 and E.1 respectively) which recognise places that have strong or special association with a community for social, cultural or spiritual reasons and places which exhibit particular aesthetic qualities valued by a community.

Consultation with members of Noongar communities was important both in the design and implementation of the assessment workshops and in the development and presentation of Noongar community views within the RFA process. The consultative process began in December 1996 with a meeting to which Noongar community representatives from across the Region and representatives from the Aboriginal Legal Service, the Noongar Land Council and the Aboriginal Affairs Department were invited. From this and a subsequent meeting, a group called the Aboriginal Action Group (later renamed the Noongar Action Group) was formed by the Noongar participants to provide one mechanism for direct Noongar participation in the RFA process.

Meeting periodically, the Noongar Action Group discussed aspects of the RFA process and how best to design a consultation strategy which would meet the needs of governments and the Noongar community. These needs were twofold:

- to provide as much information as possible about the RFA process to Noongar people living in or connected to the Region, and to provide a forum in which views and concerns could be openly expressed, formally recorded and considered in the latter stages of the RFA process; and
- to identify and document places of cultural heritage importance within the Region where this
 was the wish of community members and to identify community wishes in relation to the care
 and management of these places and their possible listing in the Register of the National Estate.

To assist in the fulfilment of this latter need, a brochure was produced in collaboration with the Noongar Action Group entitled Noongar people have your say in the RFA. This brochure was widely distributed amongst community members.

*The word 'Noongar' can be spelt in numerous ways. The spelling of Noongar in this form should also be seen to encompass the Nyoongar, Nyungar, Noongah, Nyoongah and Nyungah spellings.

2.3.1 Data sources

The Noongar communities of the South-West Forest Region provided the primary source of data for identifying and assessing places of indicative national estate Aboriginal heritage value during the CRA. Community workshops were held throughout the Region in seven locations. Data obtained from community members was, where possible, cross-referenced with previously recorded information in the Aboriginal Affairs Department cultural heritage database and from other existing reports and studies.

Information obtained through the Noongar community workshop process was also used as a primary data layer in the identification and assessment of places of aesthetic value in the Region (see Section 2.3.1).

2.3.2 Methodology

A community workshop process which enabled both the discussion of issues and the identification of places and their management needs to occur within the one forum was developed as a means to satisfy the needs of governments and the community within the available timeframe. These workshops were designed by consultants (Centre for Social Research, Edith Cowan University and McDonald Hales and Associates) with direction from the Noongar Action Group and government representatives.

Workshop locations

The locations for workshops were selected in consultation with the Noongar Action Group as being convenient central points where community members with interests in the South-West Forest Region could meet. Seven locations were selected: Busselton, Collie, Manjimup, Mount Barker, Narrogin, Northam and Pinjarra.

Workshop participation

One or two members of Noongar communities within each workshop locality were employed as Local Community Liaison Officers. These people played an invaluable role in encouraging the participation in workshops by distributing information, including videos, brochures and invitations, and by discussing with people the aims and importance of the workshops. Two members of the consultancy team, who are themselves members of the Noongar community, also actively encouraged participation by addressing community meetings and by contacting elders. This approach to encouraging participation proved highly successful, with a total of 112 community members attending the workshops.

Workshop design and process

Each workshop was designed to run for approximately four hours. Participants worked as one group during periods of discussion and broke into smaller groups to identify and document places of cultural heritage importance. The workshops were structured into three main phases.

The first phase was introductory and involved all participants in discussion about the aims of the workshop, the RFA process, national estate values and the range of places that may have national estate values to the community.

The second phase involved the discussion of issues of concern to the community with a particular focus upon issues relating to forest and cultural heritage management.

In the third phase participants worked in small groups contributing information on places of importance to their community and marking these places on maps.

All workshop participants were sent a summary of the workshop to ensure that an accurate record of the meeting had been taken. Copies of the full record of the consultation project have been deposited in regional centres for community use.

Identifying places of indicative national estate Aboriginal heritage value

The sorting and analysis of places identified as being of importance to Noongar communities was guided by community wishes and the quantity and nature of information available at the time of the project. Community members at many workshops expressed their belief that all places they identified were of equally high significance, and that it was inappropriate for people other than community members to assess those places. It was therefore necessary to employ a process of assessment and documentation which responded to community wishes, yet which was consistent with that which had been used in the assessment of non-Aboriginal national estate social values.

Following the workshop process, identified places within the Region were cross-referenced with information contained within the Aboriginal Affairs Department database and any other relevant national estate values identified.

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Although the focus of the project was national estate social and aesthetic value, the occurrence of other national estate values, such as historic value, were also documented. Where time permitted, additional secondary research was carried out to enable the fullest possible documentation of places.

It was found that only a proportion of all places identified could be documented to the level required for possible listing in the Register of the National Estate. All places identified within the Region will be considered during the development of the RFA. Mechanisms by which places can be protected are being considered as part of the RFA process (see Section 4.5).

2.3.3 Results

The workshop process collected a large amount of data on places of Aboriginal community heritage value in the South-West Forest Region of Western Australia. The results of this project should not be seen as an assessment of all of the Aboriginal heritage places and values within the Region, although they are an accurate reflection of the places and the range of values identified by the workshop participants as being important to Noongar people. In total 59 places were identified within the Region (see Appendix D). Of these:

- 15 were able to be documented to the level required for possible listing in the Register of the National Estate;
- I place was already listed in the Register of the National Estate, and
- 43 places identified by workshop participants but were not able to be documented to the level required for possible listing in the Register of the National Estate.

Places able to be documented to the level required for possible listing in the Register of the National Estate are shown on Map 6. Places identified by workshop participants, but were not able to be documented to the level required for possible listing in the Register of the National Estate, are shown on Map 9.

Some places identified were important for spiritual and traditional reasons, others for their more recent historical associations. One example of the places able to be documented to the level required for listing in the Register of the National Estate was the Avon River, which is important to the community because the Wagyl (a mythical serpent) resides there and looks after the Noongar people of the Region. The river is also significant because of a number of sacred sites located along its course. Also identified and documented in the project was Ellensbrook, a nineteenth century homestead which operated as an educational mission outside of the jurisdiction of the then Aborigines Department. A large fringe camp was also situated around the property.

The project also resulted in the collection and summarisation of community views and concerns in relation to forest and cultural heritage management. In relation to the national estate, the major issues raised by the community were the protection of places of Aboriginal cultural heritage value from the effects of disturbance and development (particularly mining and recreational activities) and the need for involvement of Noongar people in decision-making processes about cultural heritage management. Issues which were raised as being of concern to Noongar communities generally, are listed in Appendix E.

The issues and concerns raised by communities throughout the consultation process were also considered in the development of the Noongar Position Paper which details the wishes of the Noongar community in relation to the outcomes of the RFA (see Appendix F).

2.4 PLACES OF AESTHETIC VALUE

The identification and assessment of aesthetic value in the South-West Forest Region were based on national estate sub-criterion E.1, which recognises places exhibiting particular aesthetic qualities 'valued by a community or cultural group' as having heritage significance (see Appendix B).



Background to the RFA

The Regional Forest Agreements process

The Regional Forest Agreement (RFA) for the South-West Forest Region of Western Australia is part of a national blueprint for balance, certainty and sustainability in forest management.

Planning for RFAs between the Commonwealth and individual States began back in 1992, when the Commonwealth, State and Territory governments signed the National Forest Policy Statement, agreeing to work together towards a shared vision for Australia's forests.

As well as the WA RFA, the Commonwealth has signed two RFAs with Victoria for the East Gippsland and Central Highland regions, and another with Tasmania. Three more RFAs will be signed in Victoria, with others to be completed in NSW and Queensland. They are all scheduled for completion by the end of 1999.

The WARFA

The WA RFA is a 20-year agreement between the State and Commonwealth governments on the future use and management of the forests of WA's South-West, subject to five-yearly reviews.

It meets each of the three main objectives of the RFA process:

- to protect environmental values in a world class system of national parks and other reserves, based on nationally agreed criteria
- to encourage job creation and growth in forest-based industries, including wood products, tourism and minerals; and
- to manage all native forests in a sustainable way.

For the environment, it establishes a world class reserve system which is Comprehensive, Adequate and Representative of the forests' biodiversity, old growth, and other natural and cultural values.

The RFA process began in WA in 1996 and had three phases.

- ❖ The Comprehensive Regional Assessment to provide the information base for the RFA. It involved more than 40 scientific projects assessing the environmental, heritage, social and economic uses and values of the forests. Experts contributing to the assessment came from such fields as forest ecology, soil science, geomorphology, hydrology, archaeology, botany, zoology, geography, soil science and geology, as well as economics, social planning and regional development. The 46 project reports are publicly available.
- The Integration Phase in which all of the assessment data was merged and a Discussion Paper released for public consultation. The paper outlined four scenarios for an RFA.
- ❖ The development of a final RFA between the State and Commonwealth governments, taking into account the full range of public comments.





Consultation

Consultation with national, State and regional interest groups, regional community organisations and interested members of the general public has been integral to the RFA process, from the signing of the initial Scoping Agreement to the end of the formal public comment period.

The RFA Steering Committee which managed the process - representing the Prime Minister, the Premier and relevant Commonwealth and State portfolios - was advised by a Stakeholder Reference Group representing 60 different organisations, as well as Aboriginal interests.

The scientific assessments - particularly the extensive Social Assessment - involved widespread consultation with business and community groups, service providers and voluntary groups, to ensure that the RFA tapped into local knowledge and reflected issues of local concern.

All reports produced for the RFA have been publicly available through 25 information points in Perth and throughout the region (mainly public libraries) and on the Internet, with thousands of copies distributed directly to interested Western Australians.

The joint RFA discussion paper, "Towards a Regional Forest Agreement", released in May 1998, attracted hundreds of people to open days, and 30,000 public submissions which governments took into consideration when finalising the agreement.

A summary of submissions describing how the RFA addresses key issues raised is now publicly available on request, on the internet, and soon through RFA information points.



Old Growth & Biodiversity

The Comprehensive Regional Assessment identified 347 000 hectares of old-growth in the State's South-West, within 19 forest ecosystems. The RFA protects 232,800 hectares of this in the Comprehensive, Adequate and Representative (CAR) reserve system - an increase of 45,700 hectares. If all informal reserves are included, the level increases to 245,500 hectares. Old-growth is defined as forest that is ecologically mature and which has been subjected to negligible past disturbance

Under the RFA:

- More than two thirds (67 per cent) of Western Australia's old-growth forest in the South West will be protected. The nationally agreed target of 60 per cent for old-growth protection in each ecosystem has been met or exceeded.
- ❖ Where old-growth is rare or depleted, 100 per cent will be protected where possible on public land.
- ❖ A total of 67 per cent of remaining old-growth forest will be protected in the CAR reserve system. Additional areas will also be included in informal road, river and stream reserves. This means that a total of 71 per cent of old growth karri and 70 per cent of old-growth jarrah will be excluded from timber harvesting.

Examples of where there has been substantial increases in the levels of protection of old-growth forest include:

Forest Ecosystem	JANIS target	Current Reservation	RFA outcomes	Additional reservation
Jarrah Blackwood	60%	28%	60%	32%
Jarrah Mt Lindesay	60%	49%	79%	30%
Jarrah North East	100%	42%	86%*	43%
Jarrah Yellow Tingle	60%	36%	61%	25%

^{*} Deficit involves land which occurs in forest areas covered by mining leases with pre-existing legal rights.

In relation to Tingle forest ecosystems, the protection of old-growth is:

Forest Type	Target	CAR reserves (per cent)	All reserves (per cent)	Hectares (all reserves)
Jarrah Rate's Tingle	100	100	100	1020
Jarrah Red Tingle	100	100	100	210
Jarrah Yellow Tingle	60	61	64	4630
Karri Rate's Tingle	100	100	100	670
Karri Red Tingle	100	100	100	3280
Karri Yellow Tingle	60	60	65	4500





Biodiversity

The Regional Forest Agreement includes measures to further safeguard Western Australia's plant and animal life.

Most importantly, the reserve design improves the protection of forest ecosystems currently under represented in the reserve system and protects areas of high flora species richness and diversity, as well as fauna refuges.

The RFA:

- Captures areas identified in the Comprehensive Regional Assessment as 'hotspots' for endemic species, plant species richness and species important because of evolutionary biology. This includes areas along the Blackwood River valley, the Leeuwin-Naturaliste ridge, the forests between the Frankland and Hay Rivers and areas east of Perth on the Darling scarp.
- Incorporates populations of the rare Sunset frog, Orange-bellied frog and White-bellied frog into the formal reserve system, as well as capturing many populations of rare and threatened species in new reserves.
- Identifies priority areas of research, for example the description and documentation of biological diversity (establishment of a collaborative resource centre for taxonomic information on flora); the protection and conservation of biodiversity; sustainable use of natural resources; and development of tree crops as integral components of sustainable land management systems.
- Builds on the comprehensive assessment carried out at both the ecosystem and species levels for the Comprehensive Regional Assessment. Twenty seven ecosystems and 312 vegetation complexes were mapped.

Extensive flora and fauna databases were also developed. The RFA region contains 462 plant species of conservation significance. Recovery planning for 58 species of threatened flora is underway.

The region also has 123 terrestrial and aquatic animals of conservation significance. Recovery plans or interim recovery plans have been prepared for the twelve species of threatened fauna identified.



RFA and the Timber Industry

The State's native forest-based timber industry employs more than 20 000 people directly and indirectly, and has an annual turnover of more than \$850 million. Although the RFA will reduce the annual supply of jarrah and karri sawlogs available to the industry, it aims to offset job losses through long term resource certainty and industry development package.

As part of the RFA, the Commonwealth and WA governments have agreed to a \$41.5 million timber industry development package. They have signed a Memorandum of Understanding to establish a \$38.5 million WA Forest Industry Structural Adjustment Program (WA FISAP) for the native hardwood timber industry. The FISAP program includes an industry development component to facilitate greater efficiency, competitiveness and value adding; and an adjustment component for businesses and their employees who may be impacted by the RFA.

The Industry Development component will include a mix of grants and interest subsidies, to leverage up to \$40 million in loans to industry, to help retool to meet value adding objectives and expand local manufacturing. For example, the transition to whole bole milling, expansions to kiln capacity, marketing and product development. The program will encourage the development of co-operative initiatives between independent businesses to more efficiently develop and utilise new infrastructure and benefit regional communities.

As part of the RFA, both governments have agreed to bring forward the reductions in resource supply which had been foreshadowed in the Forest Management Plan to occur from 2004. An independent scientific panel has verified the long term sustained yield for the RFA.

As a result, the annual contracted level of jarrah sawlog cut will reduce from around 482,000 cubic metres at present to 286,000 cubic metres from 2004. As agreed with industry, the average annual jarrah sawlog cut to 2003 will be 324,000 cubic metres.

The annual level of karri sawlog cut will reduce from around 203,000 cubic metres at present to 178,000 cubic metres from 2004. Average annual harvesting to 2003 will be 186,000 cubic metres.

While the overall volume of first and second grade sawlog available will be reduced, governments have agreed on the need to enhance the resource available and to use each tree more efficiently. Consequently the WA government will contribute \$3 million over the next five years to enhance the forest through thinning of jarrah regrowth stands. WA will also work with industry over the next few years to trial the implementation of whole bole milling. Should the trial prove successful, this change is likely to result in significant increases in log recovery.

The RFA has identified priorities for the timber industry including the development of an internationally recognised certification program for Western Australia's forest products; investigation of alternative uses for lower grade and residue wood; support for small operators to more effectively process, market and export timber products.

There will also be a focus on research and development into techniques and technology to increase value adding for karri and marri timbers, including kiln drying, glueing and finishing.





Even with the reductions in resource supply agreed in the RFA, economic studies by ABARE and independent consultants suggest that the WA timber industry has the potential to:

- ❖ increase the percentage of sawn timber which is value-added to 75 per cent by 2020
- ❖ increase the gross value of production from sawn timber by \$100 million by 2020
- add a further \$15 million per year in value to timber by the outdoor and natural feature grade furniture industry in just five years
- * create about 500 extra direct jobs in processing hardwood timber alone, over the period of the RFA.

As a first step in the implementation of the WA FISAP, both governments have agreed to contract an independent consultant to work with the industry to identify and confirm priority areas and the most effective mechanisms for using the industry development funds for maximum gain. A final report is expected to be available within three months.

The Commonwealth and the State Government believe that Western Australia can have both a sustainable native forest based timber industry and a plantation based industry. This is the intent of the National Forest Policy which underpins the RFA.



National Parks and Reserves

The RFA is an outstanding result for conservation, delivering a world class Comprehensive, Adequate and Representative (CAR) reserve system that meets all and exceeds many of the nationally agreed targets for biodiversity and old growth protection. (The "JANIS" criteria for the national RFA process aim to conserve 15 per cent of each ecosystem that existed before European arrival, and 60 per cent to 100 per cent of remaining old-growth forest.)

The RFA delivers:

❖ An additional 150,885 hectares to the formal reserve system, bringing the total area in conservation reserves throughout the South West forest region to 1,047,200 hectares (an increase of 12 per cent).

The RFA creates 12 new National Parks:

- At the Wellington Dam near Collie (Wellington National Park 4,300 ha),
- ♦ Along the Blackwood River east of Margaret River (Blackwood River National Park 15,600 ha)
- ❖ West of Nannup (Milyeannup National Park 18,000 ha, of which 12,500 ha is new reserve)
- Margaret River National Park 4 200 ha
- Between Margaret River and Augusta (Forest Grove National Park 1 400 ha)
- South of Busselton (Yelverton National Park 1 300 ha)
- In the wandoo forest between Mundaring and York (Wandoo National Park 43,000 ha, of which 13,800 ha is new reserve)
- ❖ At Hawke block south west of Pemberton (Hawke National Park 2 900 ha).
- Mundaring National Park 3,000 ha of which 2,200 ha is new reserve
- Pickering Brook National Park (6,000 ha)
- ❖ Between Araluen and Canning Dam (Canning National Park 3,000 ha)
- ❖ In the Helena Valley linking to north of Mt Dale (Helena National Park 15,000 ha of which 8,200 is new reserve)

There will also be 25 additions to existing national parks. Among them:

- Significant additions to three existing national parks which will create a single reserve of 215,000 hectares in the Walpole-Denmark area, linking Mt Lindesay, Mt Roe and Mt Frankland. With the addition of seventeen forest blocks including parts of Sharpe, Collis and Trent north of Walpole, there is opportunity to enhance wilderness values in the area.
- Part of Hilliger block will be added to create a link between D'Entrecasteaux National Park and new national parks to the north.
- Part of Giblett block will be incorporated into the Beedelup National Park.
- Dombakup block south of Pemberton will be added to the D'Entrecasteaux National Park to protect Aboriginal heritage values.





Many of these areas were identified as important for reservation by scientists, the Australian Heritage Commission, conservation groups, tourism groups, shire councils, and local communities, during the public consultation phase of the RFA.

These new national parks, along with additions to existing parks, and a network of other formal and informal reserves make up a Comprehensive, Adequate and Representative (CAR) reserve system - crucial for the protection of forest biodiversity.

Huge tracts set aside in reserves protect habitat and evolutionary processes as well as individual species and their genetic diversity. The CAR reserve design seeks to conserve all native forest ecosystems. It is 'comprehensive' in that all forest communities are recognised by an agreed national scientific classification. It is 'adequate' in that it looks at the ecological viability of populations, species and communities. And it is 'representative' because areas included in the reserve system adequately reflect the biological diversity of forest communities.

'Formal' reserves include national parks, conservation parks, nature reserves and a new classification of 'Forest Conservation Zones' under Section 62 of the Conservation and Land Management Act. Timber harvesting will be excluded from Forest Conservation Zones, which can be created by the Minister. New legislation is proposed to provide security to these zones by requiring the approval of both houses of Parliament to revoke them.

'Informal' reserves include road, river and stream reserves. These informal reserves provide important corridors and linkages between the larger formal reserves and help to protect old-growth throughout the forest. Informal reserves contribute about 13 per cent to the CAR reserve system.



Tourism and other forest-based industries

Tourism is an important and growing industry, providing more than 7,000 direct and indirect jobs within the region. More than 120 commercial tourism operators offer a wide range of activities and nearly 2.4 million visits are made to the South-West each year. Tourists spend about \$250 million in the region annually and international tourism to the region is likely to increase by at least 8 per cent a year.

The RFA provides \$17.5 million for tourism development and strategic roads, including:

- ❖ \$2 million for a major new tourist attraction in the Donnelly River Valley, in conjunction with the Manjimup and Nannup Shires and business communities. The development will feature some of the world's tallest karri trees.
- ❖ \$2 million for three eco-lodge camping and chalet sites established in conjunction with the private sector to provide moderately priced accommodation and quality forest experiences. Possible locations include the Warren River valley (and Big Brook Dam) near Pemberton, the Blackwood River valley between Nannup and Margaret River, and the Donnelly River valley between Manjimup and Nannup.
- ❖ \$1 million for a new Scenic Drive in the Pemberton area that will link a series of existing tourist attractions in the forest, including Beedelup, Hawke and Warren National Parks, the 100 Year Forest and Big Brook Dam.
- ❖ \$1 million for tourism development at the Wellington Dam. The purchase of private land surrounding the dam at a cost of \$9.5 million has increased the opportunity for recreation and tourist developments including campsites and day visitor facilities. This, combined with the Potters Gorge private hotel/chalet project, will be a significant boost for tourism in the Collie region.
- ❖ \$2 million for sealing Mowen Road between Nannup and Margaret River.

The RFA helps create other opportunities for expansion of tourism in areas such as:

- ❖ Forest blocks near Margaret River, Bridgetown, Walpole and Denmark
- Blackwood River valley, near Nannup
- * Hawke Block adjoining Warren National Park, near Pemberton
- Dombakup and Northcliffe adjoining D'Entrecasteaux National Park

Minerals

Generating \$2.68 billion and directly employing 8118 people in 1995-96, the mining industry makes a major contribution to the regional economy. Almost half the RFA region has moderate to high mineral potential and is covered by State Agreement Acts and mineral tenements under the Mining Act. The region has world class resources in bauxite, gold, coal, tantalum, spodumene and mineral sands.

- Through consultation with the mining industry, RFA reserves have been chosen to minimise direct conflict with known mineral deposits and existing mining leases and tenements where possible.
- ❖ The agreement provides certainty of access through the identification of defined land tenures. This will give the industry confidence to invest in new mineral exploration and mining.





Other forest-based industries

The forests are also important for a range of smaller businesses including beekeeping, floriculture, biotechnology and basic raw materials such as sand, limestone and gravel.

Under the RFA:

- All these industries are taken into consideration, balancing their needs with the creation of new reserves.
- ❖ For example, wildflower pickers who may be affected by the creation of large reserves in native forest between Walpole and Denmark will be able to continue their picking, under strict conditions, until the reserves are formally established.
- ❖ Beekeepers will benefit from the reservation of an additional 45,700 hectares of old growth forest. Access to existing apiary sites in conservation reserves will be permitted until new reserves are established. Ongoing management issues will be addressed in the next management plan for each reserve.



The RFA and Indigenous Issues

The forests of the South-West have been the home of Noongar people for tens of thousands of years. The Noongar Action Group was formed in 1996 to ensure that Aboriginal heritage and consultation issues were integral to the development of the agreement.

In their submission to the Commonwealth and State Governments, the Noongar Action Group made 10 recommendations, including calls for ongoing formal consultation, protection of old-growth forests, full access to the forests, training and employment opportunities; respect for Noongar Elders in the RFA process, and a means to develop Noongar aspirations.

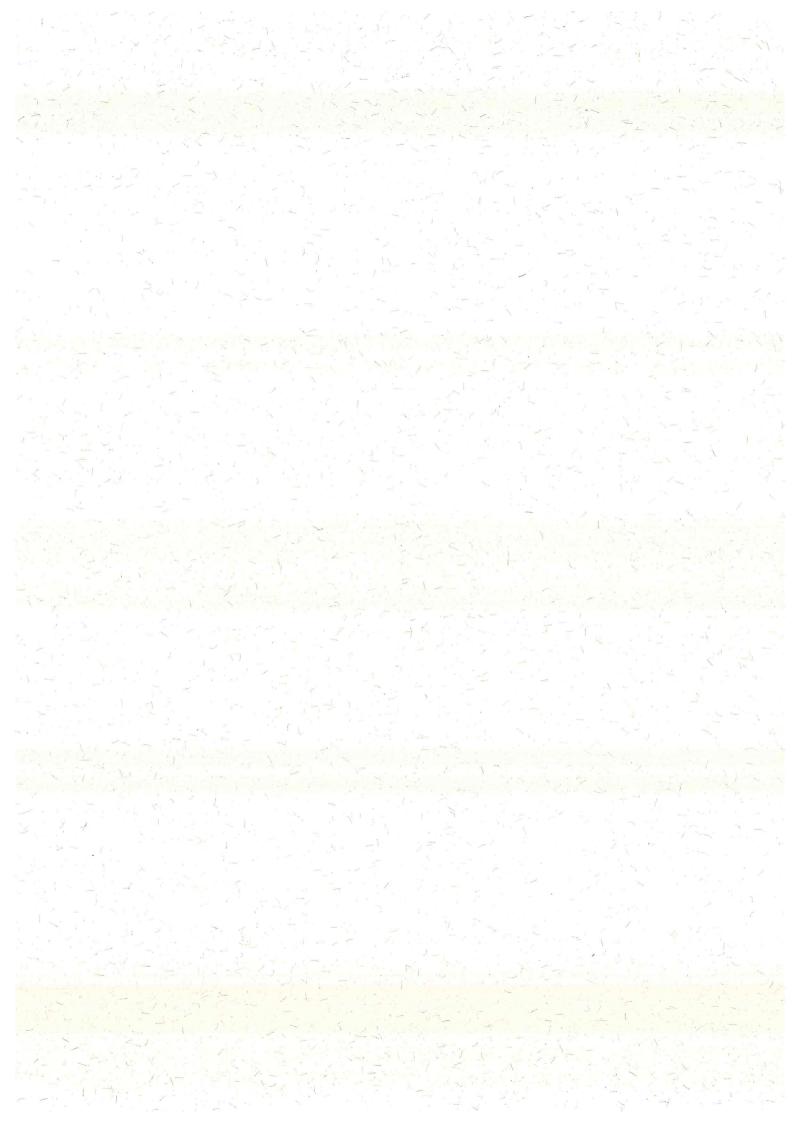
The RFA includes commitments by the WA Government to:

- develop a formal consultation process with Aboriginal people about policy and procedures for the protection of Aboriginal heritage values on CALM-managed lands;
- consult with Aboriginal people on mechanisms to enable more effective involvement of Aboriginal people in the protection of culturally significant sites and the provision of training and employment opportunities
- protect Aboriginal sites in accordance with the Aboriginal Heritage Act 1972 (WA) and develop protocols for, and linking, the CALM geographic information system with information held by Aboriginal Affairs Departement (AAD)
- establish CALM procedures and protocols, in consultation with AAD and Aboriginal people, and include relevant Aboriginal heritage expertise in CALM, to identify early and protect Aboriginal sites as identified in the Act.
- introduce amendments to the CALM Act to permit Aboriginal people to undertake traditional and cultural activities including hunting, gathering and ceremonies on State forests and public land;
- ensure, in consultation with Aboriginal people, that Aboriginal heritage values, especially those associated with old-growth forest, are recognised and managed in culturally appropriate ways;
- facilitate access to and use of CALM-managed forests by Noongars for culturally important activities;
- faciltiate cross cultural awareness and interpretive activities to inform and educate the wider community about Noongar values and links to the South-West forest region;
- comply with the Commonwealth Native Title Act 1993; and
- monitor field activities in relation to the protection of Aboriginal sites.

Dombakup Block south of Pemberton will be added to the D'Entrecasteaux National Park to protect Aboriginal heritage values.









People and Communities

The RFA region stretches across 4.25 million hectares from near Gingin in the north-west to near Denmark in the south-east, and has an estimated population of 155,000 people. The 40,000 families and 70,000 full and part-time employees who live there rely on a wide range of industries including agriculture, mining, mineral processing, manufacturing, hardwood and plantation timber milling, wood processing, recreation and tourism. These major industries contributed \$8,896 million to Western Australia's Gross State Product for 1995-96. The forests also support a range of smaller businesses such as beekeeping, floriculture, biotechnology and basic raw materials such as sand, limestone and gravel.

The RFA involved a thorough social assessment of the importance of forests to local people, and how change may affect not just their personal livelihoods but the future of their towns and community services. The assessment involved widespread consultation with local government, community and business groups and individuals, with numerous surveys, workshops and personal interviews.

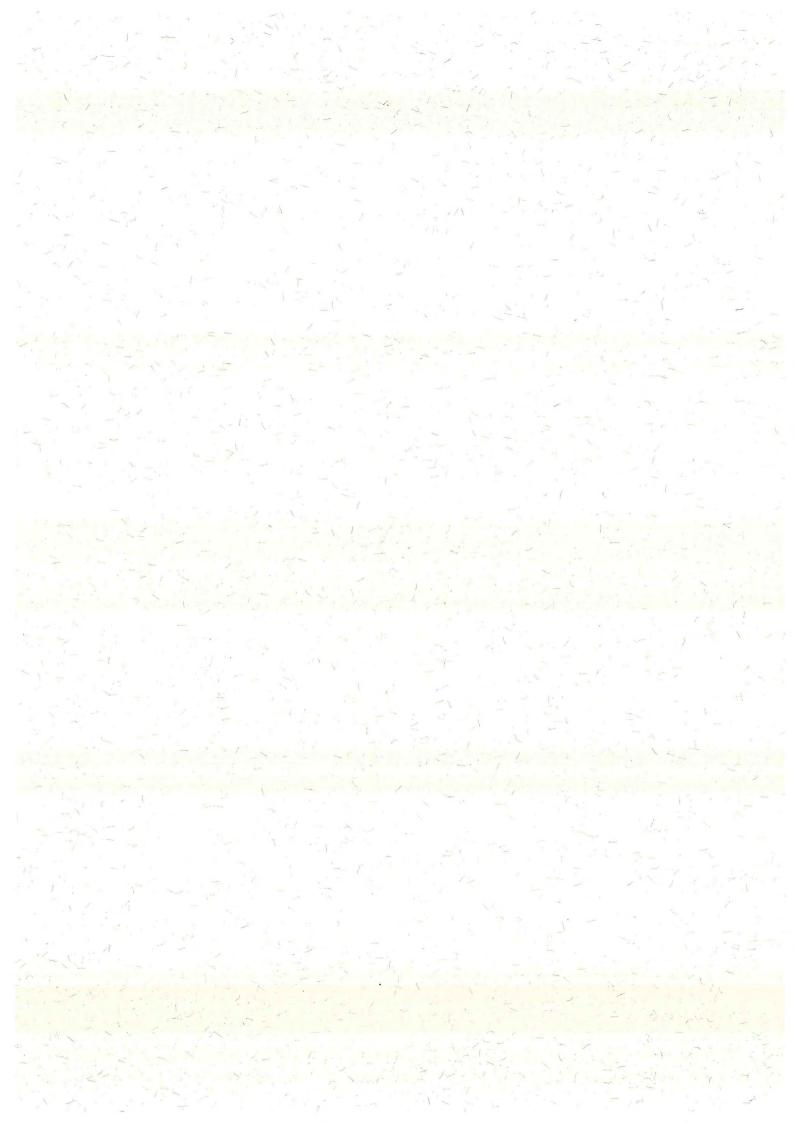
Case studies of eight towns in the region identified Nannup, Pemberton and Manjimup, with their long tradition of reliance on the timber industry, as needing particular attention when developing the RFA.

For the people and communities of the South-West, the RFA delivers:

- ❖ A balance between the many different and complex uses of the forests.
- ❖ Certainty for the next 20 years so that individuals can plan for the future, businesses can attract investment in long-term ventures and communities can plan to secure and develop services like health and education.
- Incentives for business to take advantage of new opportunities in value-adding and local manufacturing and financial assistance for workers in the timber industry. This will be of particular benefit to smaller-towns like Nannup.
- Opportunities for expansion of local tourism industries with new reserves in areas like the Wellington Dam near Collie, forest blocks near Margaret River, Bridgetown, Walpole and Denmark, Hawke Block adjoining Warren National Park, and Dombakup and Northcliffe adjoining D'Entrecasteaux National Park.
- \$17.5 million for the development of tourism attractions and facilities, including tourist and access roads.
- Certainty of access and confidence for the mining industry, through the identification of defined land tenures. In 1995-96 the industry directly employed more than 8,000 people.
- Other forest-based industries have also been taken into consideration. For example, wildflower pickers who may be affected by the creation of large reserves in native forest between Walpole and Denmark will be able to continue their picking, under strict conditions, until the reserves are established.
- ❖ Beekeepers will benefit from the reservation of an additional 45,700 hectares of old growth forest. Access to existing apiary sites will be permitted until reserves are established, and ongoing management issues will be addressed in the next Forest Management Plan.











Regional Forest Agreement



FORESTS TASKFORCE

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