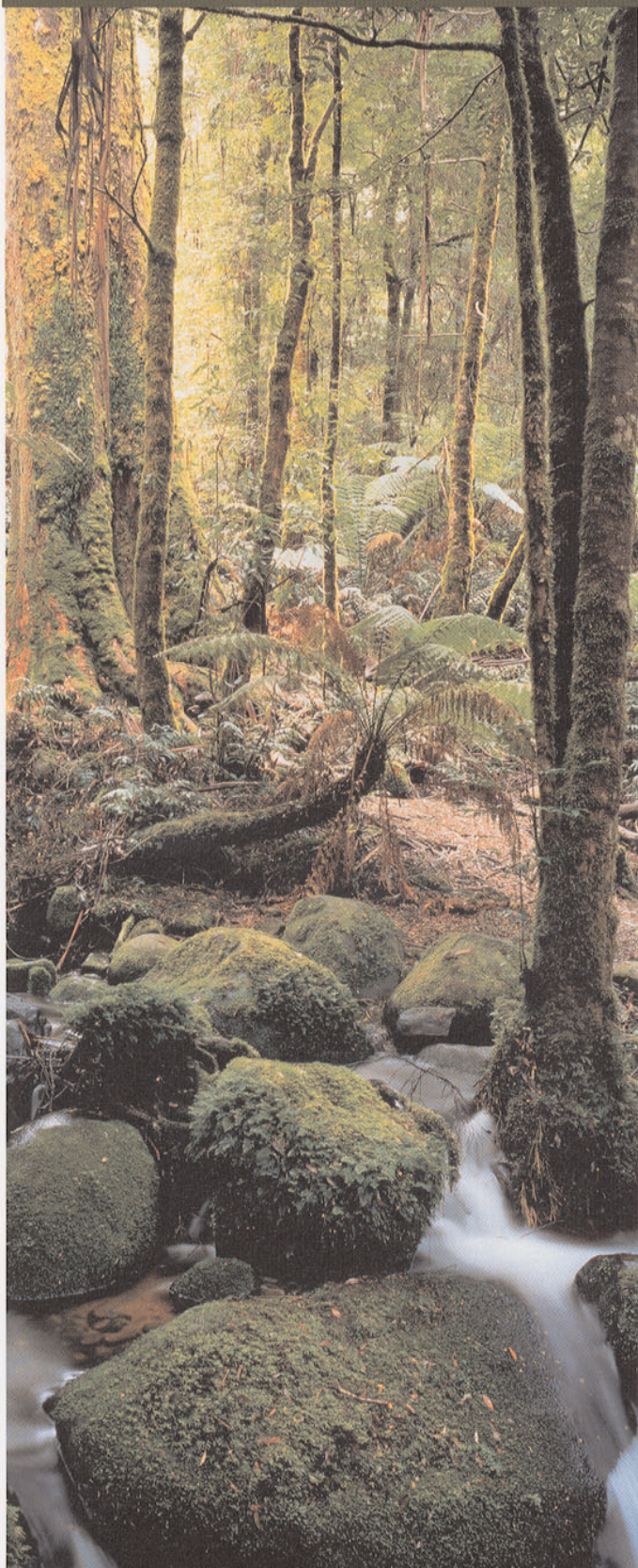


A U S T R A L I A N *Forest Profiles*

A series from the **National Forestry Inventory** about forest types and major issues relating to them.



Key Issues

- Cool temperate rainforests occupy a relatively small proportion (about 590 000 hectares [ha]) of Australia and occur mainly in Tasmania.
- Cool temperate rainforests are an important part of Australia's forest ecosystems and have special values for conservation. They are ancient forests that originated in Gondwanan times (about 200 million years ago) and show important links with forests of other southern land masses.
- Cool temperate rainforests have been and remain an important source of specialty timbers for furniture and other uses, and have equally important non-wood values.
- Cool temperate rainforests are generally well-reserved, but there are concerns about fire and disease management.
- Compared with other forest types, cool temperate rainforests have not been extensively cleared. In Tasmania, the present rainforest estate is estimated to be about 85% of that existing before European settlement.

*This brochure describes the biological, cultural, economic and heritage values of cool temperate rainforest communities. It focuses on **pure** cool temperate rainforest communities and makes only passing mention of eucalypt species and species from other rainforest types.*



SOUTHERN cool temperate rainforests are confined to Australia, New Zealand and southern South America. They are populated largely by species of *Nothofagus* and/or conifers. Australia's cool temperate rainforests occur mainly in Tasmania, although some significant outlying patches are found in Victoria, New South Wales and southern Queensland. The forests are highly valued as a cultural and economic resource as well as for their scientific and conservation significance.



Flower of *Eucryphia lucida* (leatherwood).

Although some cool temperate rainforests have been harvested in the past and some land has been cleared, many of these forests are still in a relatively pristine condition. Today most of the mainland forests occur in reserves—including some examples within the New South Wales Rainforests World Heritage Area. More than 40% of the Tasmanian cool temperate rainforests are in reserves with most of this reserved forest forming part of the Western Tasmanian Wilderness World Heritage Area.

Mature cool temperate rainforests are no longer widely harvested for timber. Rainforest elements that occur within wet eucalypt forests, however, continue to supply special timbers such as blackwood and myrtle. There has been considerable debate about the ecological status and future use of these mixed forests in Tasmania and Victoria as they also have high nature-conservation values. Other values of the rainforests include their merit as a resource for tourism, their use as a nectar source for apiarists, and their potential as a resource for pharmacological research and development.

About the Resource

AUSTRALIA'S cool temperate rainforests occur largely in the south-eastern part of the continent. While some sources list cool temperate rainforest in south-east Queensland, this reflects the presence of patches of *Nothofagus moorei* (Antarctic beech) rather than forest as defined by the National Forest Inventory. The southern cool temperate rainforest is dominated by *Nothofagus cunninghamii* (myrtle beech) and/or endemic Tasmanian conifers, such as *Lagarostrobos franklinii* (Huon pine), *Phyllocladus aspleniifolius* (celery top pine), *Athrotaxis selaginoides* (King Billy pine) and *Athrotaxis cupressoides* (pencil pine). Other genera such as *Atherosperma* (sassafra) and *Eucryphia* (leatherwood) may be important components of the tree layer. In eastern Victoria, dominant canopy species include *Atherosperma moschatum* and *Elaeocarpus holopetalus* (black olive berry). *Nothofagus gunnii* (deciduous beech) becomes important at high altitudes in Tasmania.

On fertile soils, the structure of the forests is fairly simple, with a relatively closed upper tree canopy over a sparse secondary tree or shrub layer, but with an abundance of ferns, mosses, liverworts and lichens. Tree ferns are often a feature of these 'callidendrous' (= beautiful tree) forests. The diversity of higher plants is usually low—in some cases only *N. cunninghamii* is present. As the soils become increasingly infertile, the tall, well-formed structure of the trees declines, other species assume co-dominance and a pronounced shrub layer becomes evident. The diversity of ferns in these 'thamnic' (= shrubby) forests is usually lower than that found on more fertile sites. On the poorest soils, there is no clear separation of shrub and tree layers, the overall richness of flowering plant species is high and the abundance of ferns is reduced. These 'implicate' (= tangled) forests are common on the quartzite rocks and siliceous soils of western Tasmania.

Biological Significance

The southern closed forests of Australia share a Gondwanan origin with similar forests in New Zealand and South America. Many of the plant genera in these forests are therefore common to these countries and contain many closely related species that fill similar ecological niches. Examples include *Nothofagus*, *Eucryphia*, *Aristotelia* and *Lagarostrobos*. Many species of flora and fauna of the southern closed for-

ests are primitive and, although widespread in southern Australia during the Tertiary era, now occur only as relics. Some species such as *Lagarostrobos franklinii* (Huon pine) have a special significance because specimens of their trees are not only old (they can live for up to 2000 years), but have grown slowly and produced clear growth rings. This makes them ideal subjects for studies of climatic changes.



Flowers and foliage of *Athrotaxis cupressoides* (pencil pine).

Use of the Resource

Ownership

The principal tenure categories for cool temperate rainforest are set out in Table 1.

Cultural and economic values

Timber

Past logging of rainforest in Tasmania has been limited by inaccessibility and generally low sawlog yields. Logging is currently confined to the production of small quantities of special timbers from previously cut-over areas. These areas are less than 10% of the total area of Tasmanian rainforest although about 28% is theoretically available for multiple uses including wood production. The 1990 Forests and Forest Industry Strategy has indicated that some areas of rainforest will be required for the on-going supply of special timbers.

Substantial quantities of sawlogs and pulpwood continue to be harvested from rainforest species in

mixed forest (vegetation with a eucalypt overstorey and a rainforest understorey). The long-term target for the supply of sawlogs from rainforest species—from both mixed forest and rainforest on public land—is 5500 cubic metres (m³) annually.

Some rainforest areas on private land are being converted to plantations, mainly of *Eucalyptus nitens*, in north-western Tasmania.

Timber harvesting of cool temperate rainforest in Victoria and New South Wales has been restricted by the limited and dispersed nature of the resource. In both States, patches of mature, eucalypt-free rainforest on public land outside reserves are now excluded from logging by management prescriptions.

Heritage Value and Tourism

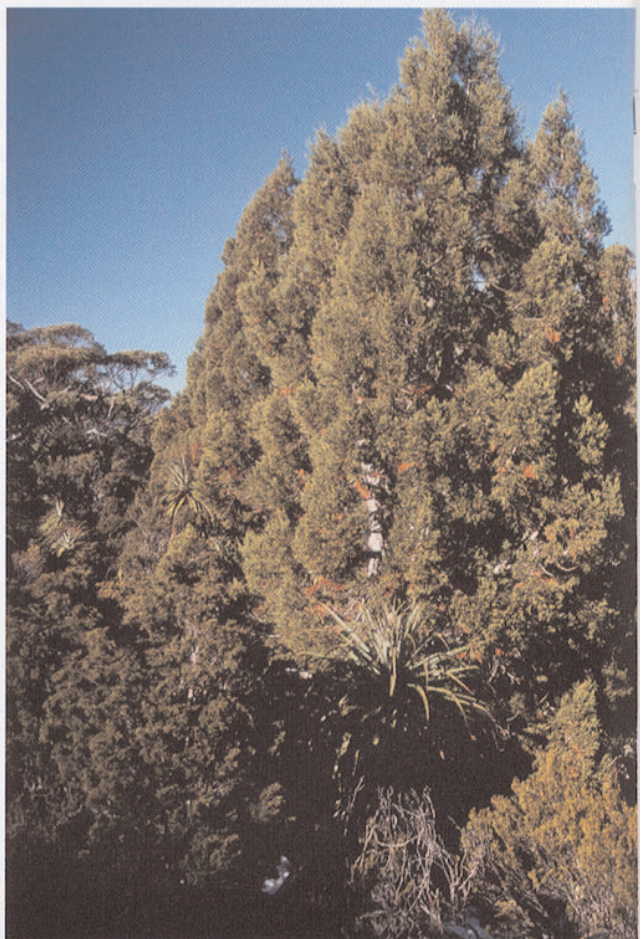
Detailed studies of the revenue derived from tourism in cool temperate rainforest have not been made. However, tourism in some rainforest areas is considerable. Examples are the Gordon River, Weindorfers Forest at Cradle Mountain and the deciduous beech forests at Mount Field in Tasmania.



View of bridge foundations and creek in cool temperate rainforest.

Distribution of Cool

Cool temperate rainforest in Australia is confined discontinuously to cool, wet parts of the east coast, from Tasmania to the MacPherson Range below a latitude of approximately 32°S. It covers about 600 000 ha or about 0.08% of the continent. The stronghold for cool temperate rainforest is Tasmania where there are about 545 000 ha. About 15 000 ha occur in New South Wales and 3000 ha in Victoria. In Tasmania, large continuous tracts of cool temperate rainforest cover western parts of the island. The largest patch is about 65 000 ha. Large patches also occur in Tasmania's north-eastern highlands. Elsewhere, cool temperate rainforest is usually confined to small patches of less than 100 ha in wet sheltered gullies in southern Australia or in cool, moist mountainous areas in the north.



Athrotaxis cupressoides (pencil pine) and palm-like *Richea pauciflora* in a mountainous region of Tasmania.



A walking trail through rainforest in Mt Field National Park, Tasmania.

TABLE 1 Areas (ha)^a of cool temperate rainforest in Tasmania

	Tas
State forest ^b	196 354
Conservation reserves ^c	187 039
Crown land	144 692
Private land	17 207
Unresolved tenure	0
Total	545 291

^a Figures may not add up due to rounding.

^b Includes timber reserves.

^c Includes National Parks and various other State conservation areas.

Temperate Rainforest



Pandanus pandanifolia in a relatively open form of cool temperate

M. Ryan



rainforest in various tenure categories.

Vic	NSW	Total
664	696	197 704
2 458	5 826	195 323
37	421	145 150
7	7 649	24 862
0	94	94
3 165	14 676	563 132

ervation categories.

Data supplied by the
National Forest Inventory



A Commonwealth Government
Department of Environment and Heritage
Cooperative Program



Parks Victoria

A mossy trunk in Yarra Ranges National Park, Victoria.



Tasphoto Services

Mt Field National Park, Tasmania.

In 1991, five additional rainforest sites were developed for visitor use under the Tasmanian component of the National Rainforest Conservation Program. As noted above, several sites containing cool temperate rainforest are included in the Eastern Australian World Rainforest Heritage Area. Some of these incorporate renowned and popular tourism areas such as in the Border Ranges area and Barrington Tops (Northern Tablelands, New South Wales).

Mining

Several of Tasmania's rainforest areas are known to be rich in minerals. The rock type known as Mount Read volcanics, which has provided a good deal of Tasmania's past and present mineral wealth, underlies much of the rainforest in western Tasmania. Some of the rarest rainforest communities also occur on Mount Read volcanics. Modern techniques and off-site processing have greatly diminished the direct impacts of mining on the surrounding rainforests. Examples in Tasmania include the Hellyer mine and the Henty goldmine.

Other uses

There are numerous other uses of cool temperate rainforest. One of the most economically important is the production of honey from the blossom of leatherwood trees. More than 500 tonnes of leatherwood honey can be produced in a good season. A section of the horticultural industry also depends on rainforest. Species raised commercially include native laurel, leatherwood and King Billy pine.

Forest Management

Conservation

The temperate rainforests of Australia are now largely within reserves, and informed management of those areas outside reserves is designed to ensure the maintenance of this forest in perpetuity. All vascular plant species and nearly all individual plant communities of the forests are represented within established or proposed reserves. Planning to meet these reservation needs is being undertaken by the various State authorities responsible. However, there are some conservation problems that require action and future monitoring to ensure the continued well-being of these forests. Fire, pests and diseases affect forests within as well as outside reserves, so problems for conservation do not cease once the forests are reserved. The land use issues for rainforest outside of reserves are predominantly conservation, mining and forestry. Balancing these competing interests continues to be an issue for land managers and policy makers.

Threats

Cool temperate rainforests are extremely sensitive to fire. Past attrition by fire is in part evidenced by the forests now growing mainly on sites protected by climate or topography from all but infrequent fire—and by their absence from adjacent and otherwise favourable sites. Rainforests continue to be exposed to severe fires which may threaten their current extent if not their continued existence. This is evidenced by the Savage

River wildfire in Tasmania in 1982, which burned 15 000 ha of rainforest in a single fire. It has been estimated that about 30% of King Billy pine rainforest area has been destroyed by fire since the 1830s. Much of the area damaged by fire still has not recovered. A major management issue yet to be fully addressed is the effective fire protection of rainforest on unallocated Crown land in remote parts of western Tasmania. The threat of fire would be reduced by banning campfires in rainforest areas (fires are currently prohibited in most of the World Heritage Area and on peat soils of Tasmania). Fire incidence would be reduced further if fuel reduction burning in adjoining vegetation was undertaken according to strict prescription.

Most of the southern forest is dominated by *Nothofagus cunninghamii*, a tree susceptible to a potentially lethal disease, myrtle wilt, caused by a fungal pathogen *Chalara australi*. The fungus is thought to be a naturally occurring component of the forest, but its incidence and severity of attack is greatly exacerbated by disturbances such as road-making and timber harvesting. Many of the vascular species found in the cool temperate rainforests are also susceptible to attack by the root-rot pathogen *Phytophthora cinnamomi*. This fungus is not active in soils below about 15°C, so it does not currently present a risk in cool temperate forests where the canopy is closed.

One of the major concerns of climate change for these forests is likely to be that of the secondary effects of elevated temperature on the incidence of fire and disease. The modelling of such effects is not yet able to predict likely changes to forest viability.



Atherosperma moschatum (sassafras) flowers.

Outlook

The Regional Forest Agreement processes, under the National Forest Policy, offer a major opportunity for assessing the wide range of current demands on the cool temperate rainforests. A satisfactory outcome will see cool temperate rainforests adequately protected in dedicated forest reserves as well as other social and economic uses having managed access to these forest resources.

The long-term security of cool temperate rainforest will depend upon successful management systems which aim to protect cool temperate rainforest from fire and disease.



Yarra Ranges National Park, Victoria.

M. Fagg

Parks Victoria



Westmoreland Falls, Tasmania.

Tasphoto Services



Autumn and summer (inset) foliage of *Nothofagus* (beech).

M. Fagg

M. Ryan

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Front cover: Yarra Ranges National Park

Australian Forest Profiles 1997 ISSN 1320-5064

Acknowledgments

We are grateful to M. Brown of Forestry Tasmania for preparing the text. We also acknowledge NFI Steering Committee members and K. Binnington for reading the manuscript and making editorial suggestions. Photographs were supplied by: © Tasphoto Services, Department of Environment and Land Management, Tasmania; © Parks Victoria; M. Fagg, © Australian National Botanic Gardens; and M. Ryan, Bureau of Resource Sciences.

Other titles in this series

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