

# Forest Profiles

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

### Key Issues

- Known locations and area of tropical rainforest have greatly increased following Regional Projects of the National Forest Inventory.
- Logging in tropical rainforest has ceased on public land and now occurs only in small areas of private forest in Queensland.
- Tropical rainforests are highly susceptible to damage from weeds, fire, feral animals, poaching, and cyclones as well as inadequately controlled tourist activities.
- The areas of tropical rainforest between Mossman and Cooktown earned \$76 million from tourism in 1991.
- The development of rainforest timber plantations on degraded agricultural land is being initiated by

local authorities and the State Government in north Queensland with additional assistance of \$4.2 million from the Commonwealth Government.

- The Wet Tropics Management Authority was formed in 1990 to 'provide for the protection, conservation, presentation, rehabilitation and transmission to future generations of the Wet Tropics of the Queensland World Heritage Area'.

*This brochure presents information about rainforests in Australia north of the Tropic of Capricorn.*



**TROPICAL** rainforest in Australia today represents 0.10–0.15% of the tropical rainforests of the world. These Australian forests occupy only 0.18% of the continent. Their importance, however, is not measured in terms of these seemingly

trivial quantities. Clearing of rainforest has virtually stopped in Australia. Elsewhere, even conservative estimates of global loss of rainforest (0.5–0.6% a year) will see nearly all of it gone in about 150 years; other estimates of about 2% clearing a year indicate exhaustion of the resource in closer to 50 years. The rainforests of Australia's wet tropics are living examples of very ancient forests that once dominated the continent when the climate was much wetter than today. Australia's tropical rainforests are now restricted by climate to the north and along the east coast.

## About the Resource

**I**N Australia, tropical rainforests are tree-dominated communities with a closed canopy. The dominant trees come from a wide range of plant families, but generally do not include eucalypts in mature or climax forests. The vegetation is diverse and ranges from the most structurally complex, which have large evergreen leaves, buttressing roots, and abundant vines, to the least complex (known locally as 'vine thickets'; and 'scrubs') in the much drier areas. Topography, climate and soil fertility are major contributors to the diversity



*Monsoon rainforest,  
Rum Jungle, Northern Territory*

Allen Fox

of these forests. Botanists have developed methods for classifying the seemingly bewildering array of variety.

In broadest terms, the tropical rainforests fall into those receiving significant rainfall throughout most months of the year (called 'wet' rainforests), and those occurring in the monsoonal north where summer is very wet and the rest of the year very dry ('dry' rainforests or vine thickets and scrubs).

## Biological Significance

The wet tropics of northeast Queensland contain the highest concentration of families of primitive flowering plants in the world. The discovery of this fact dramatically changed the understanding of the origins of this vegetation. Previously, these forests had been looked on as marginal representatives of the much richer and thus presumed older tropical vegetation of Asia which had migrated into Australia as it drifted north in the past 40 million years. Now it is known that the tropical rainforests of northeast Queensland are living representatives of ancient forests that have existed here since the time Australia was connected to Antarctica and South America more than 40 million years ago. There is also a significant element which did come from Asia in the more recent geological past. This element shows the movement of species into Australia when the continent began to nudge the Asian continent as Australia drifted northwards. The significance of all these findings formed part of the case for the international recognition of the wet tropical rainforests of north-east Queensland as places of importance to the heritage of the world.

Australian tropical rainforests provide habitat for many animal species. The wet tropics of Queensland, for example, while representing 0.18% of the area of the continent, contain about 30% of Australia's marsupial and frog species and 62% of butterfly species.

The discovery of fossils of many kinds of rainforest animals which lived in Australia at least 20 million years ago has emphasised the long history of rainforests in Australia and their biological richness.

## Use of the Resource

**R**AINFORESTS in the Australian tropics have been used for timber production and cleared for agricultural and pastoral land since last century. Estimates of the extent of clearing of tropical rainforest vary from about 50% to about 20%. Clearing varied from very high (47%) on lowland areas to only 5% on lowland foothills. In the 1980s, concerns for the long-term viability of these forests led to a major public debate that resulted in large changes to their management. About 700 000 hectares of tropical rainforest in north Queensland were eventually inscribed on the World Heritage List.

Protection of the biological diversity and cultural heritage which these forests represent cannot easily be assigned a useful monetary value. Nevertheless, to ensure that this diversity is available for use by future generations, we need effective management for ecologically sustainable development.

### Ownership

There are several different classes of ownership of tropical rainforest (Table 1). In Queensland, the main categories are State Forest (41%) and conservation reserves (27%). In the Northern Territory, tropical rainforests are mainly on Aboriginal land (86%), whereas in Western Australia they predominate on a variety of conservation reserves (57%).

### Economic values

#### Timber

About 160 000 hectares of State Forest in North Queensland between Townsville and Cooktown were managed for production of timber until logging ceased in the late 1980s after World Heritage nomination of these rainforests. The Queensland Government has announced that logging of rainforest species on all

**Ownership categories for tropical rainforest**

**TABLE 1**

	Qld (ha)	NT (ha)	WA (ha)	Aust (ha)
State Forest <b>a</b>	483 900	-	-	483 900
Conservation reserves <b>b</b>	315 700	14 381	3 964	334 045
Crown land	203 800	2 687	395	206 882
Private land	93 700	-	585	94 285
Aboriginal land	83 800	174 248	2 052	260 100
Other	-	12 245	-	12 245
<b>Total</b>	<b>1 180 900</b>	<b>203 561</b>	<b>6 996</b>	<b>1 391 457</b>
Previously known area <b>c</b>	985 000	147 000	0	1 132 000

**a** includes timber reserves.

**b** includes National Parks and a variety of other State conservation categories, including proposed reserves.

**c** Resource Assessment Commission Final Report 1992.

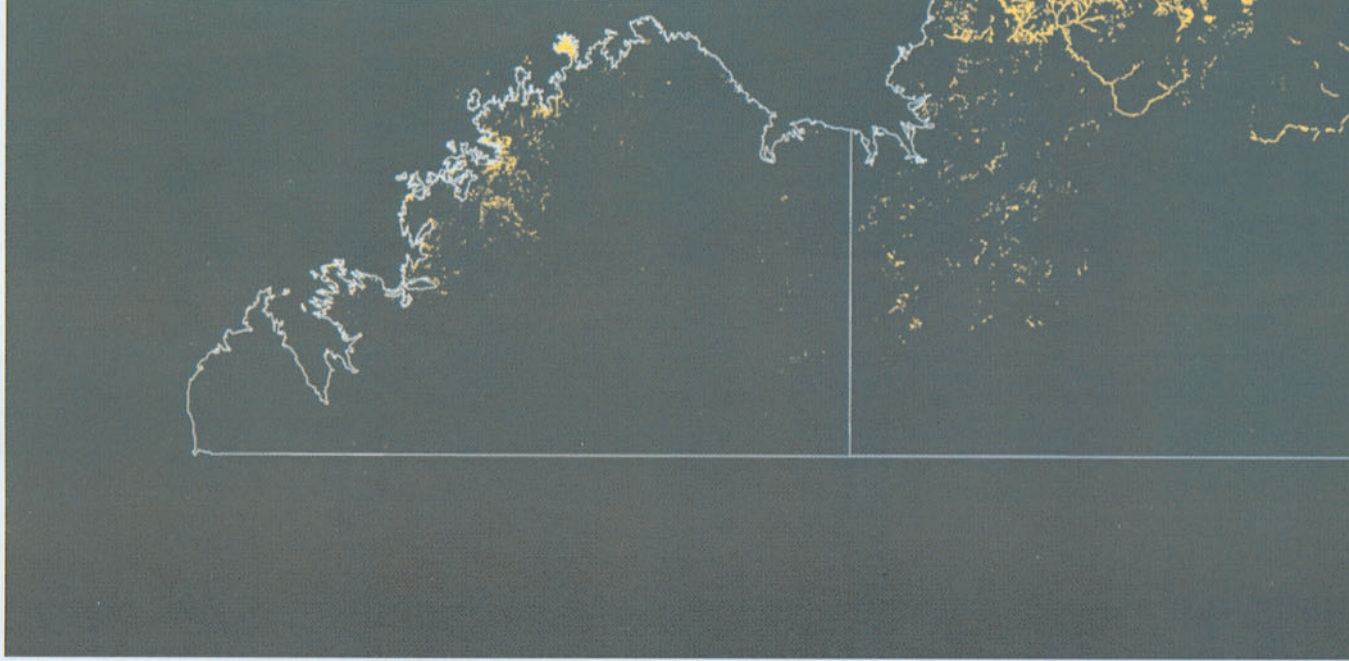
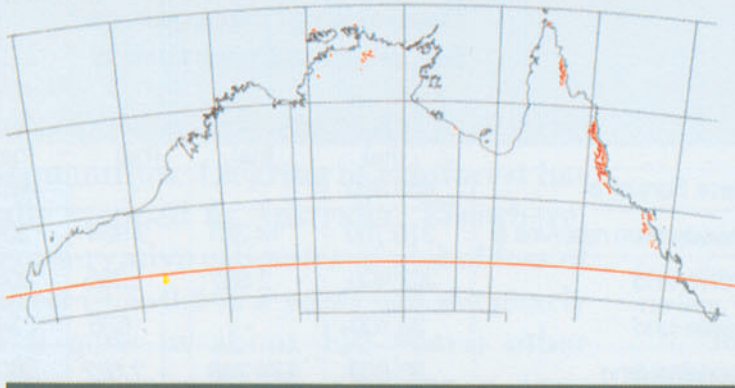
Crown land ceased on 30 September 1994. The local industry now has access to alternatives to rainforest timbers. Logging of privately owned rainforest is limited, but the precise quantity is unknown and very limited production of specialty timber occurs.

The volume of tropical rainforest timber removed from Crown lands in Queensland declined from 165 000 cubic metres (m<sup>3</sup>) in 1974–75 to 103 000 m<sup>3</sup> in 1984–85. Following World Heritage listing it declined to 6000 m<sup>3</sup> in 1989–90 (Figure 1, p.6). The level of sustainable production, before heritage listing, was estimated as 60 000 m<sup>3</sup> a year.

#### Tourism

Today, tourism is the major economic use of tropical rainforests. The declaration of sections of far north Queensland as World Heritage sites has focused attention on the rainforests that they protect and resulted in greatly increased numbers of tourist visits. A recent study has reported that the wet tropical rainforest between Mossman and Cooktown earned \$76 million for the local community in 1991. It was further estimated that the total Queensland wet tropical rainforest contributed about \$100–\$150 million to the economy in that year. Comparative statistics for earlier periods are not available.

(continued on page 6)



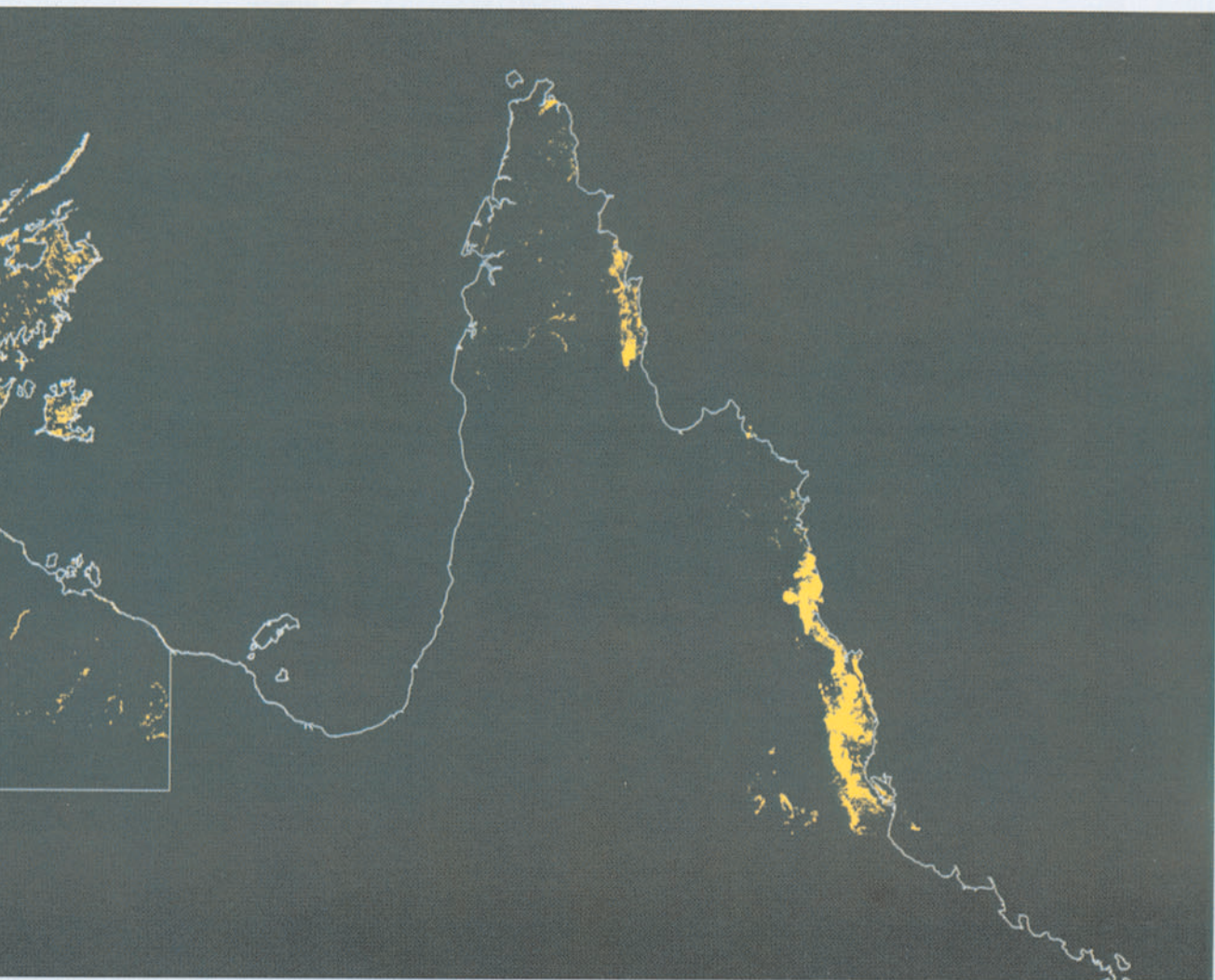
## Distribution of Tropical Rainforest

Tropical rainforest covers an estimated 1.4 million hectares (ha) in Australia. It occurs in northern and eastern Queensland, the Northern Territory and Western Australia. There are about 1.2 million hectares in the coastal and adjacent areas of northern Queensland, primarily north of Ingham but with some pockets extending south to Gladstone.

Westwards, across the remainder of the continent, tropical rainforest occurs as thousands of small patches which are nevertheless biologically significant. The rainforest resources of Australia include not only those typified by the lush, well-watered rainforests between Townsville and Cooktown. They also include forests with related species which grow along rivers in the drier regions

to the west and those which periodically lose some of their leaf canopy during the severe annual winter droughts (the 'dry'). These 'dry' rainforests have been the least known. Recent studies in Western Australia and the Northern Territory, carried out under the National Forest





Colin Tattersall

**Photograph:** *understorey Wet tropics rainforest Mossman Gorge, Queensland*



**Data supplied** as part of the National Forest Inventory by the Western Australian Department of Conservation and Land Management, the Conservation Commission of the Northern Territory, and the Queensland Department of Primary Industry Forest Service.

Inventory Regional Projects Program, have greatly expanded the known locations of dry rainforest. These and other studies have also increased the known area of tropical rainforest from 1 132 000 ha (Resource Assessment Commission 1992) to the current figure of 1 391 457 ha. The increase is due to improvement in knowledge of locations, not to expansion of forests.

### Other uses

Aboriginal communities, for example at Belyuen and Milingimbi in the Northern Territory and in the wet tropics of Queensland, use rainforest plants as a source of food, wooden implements, string, dyes, paint and ornamentation, fish poison and medicines. About 20–25 Australian rainforest species are regularly used in the horticultural trade, for example *Podocarpus nerüfolius*, *Terminalia sericocarpa* and *Cardwellia sublimis*. Many more species are grown as speciality plants.



Climbing plants ('lianas'), Queensland

M. Fagg

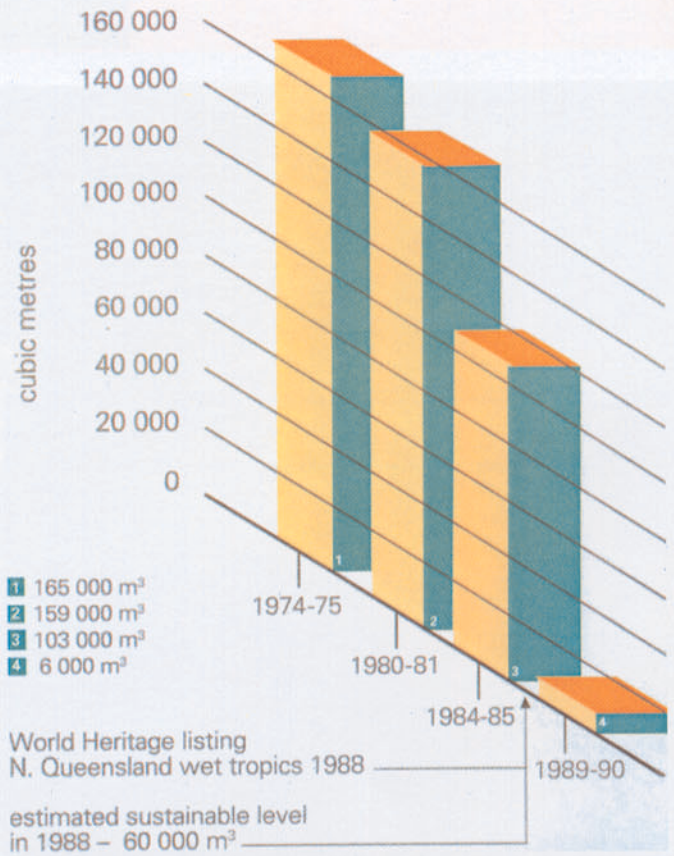


Figure 1. Volume of timber removed from wet tropical rainforest on Crown land in north Queensland

Tropical rainforests have a high level of genetic diversity. Many of the species that they contain have a high existing or potential value for food, medicine and chemicals and for improved breeding of food plants currently cultivated (e.g. *Macadamia*). The rainforests are also a source of species with potential as plantation timber trees, ornamentals and for land rehabilitation. Specialist interests have grown in recent years as seen for example in the promotion of Australian rainforest trees for use in bonsai, the sale of bunya nuts (*Araucaria bidwillii*) as specialty foods and the use of lawyer cane (*Calamus*) in craft industries. Some rainforest species such as blackbean (*Castanospermum australe*) and *Duboisia* have known pharmaceutical values. However, the use of Australian rainforests as sources of pharmaceuticals and genetic resources occurs on a limited scale.

### Employment

The change in status of large tracts of forest from timber production to conservation created significant social dislocation. Over \$40 million in Federal grants was directed at mitigating such dislocation through

job creation, labour adjustment and business compensation. Programs to ameliorate the social costs of land-use changes are essential to implementation of such changes.

The development of a new industry based on rainforest timber plantations on degraded agricultural land was initiated by local authorities and the State Government. Demonstration projects on private land in north Queensland have been facilitated with the assistance of \$4.2 million of Commonwealth funds. In 1993 and 1994, 250 jobs for trainees were created.

## Conservation

NATIONAL and State programs have been implemented to ensure that the wet tropical rainforests of north Queensland are conserved for current and future generations. Programs providing interpretation and access for visitors to these forests have been established, as well as programs to help individuals, companies and communities adjust to the changed use of the forests. Commercial timber production is allowed only on a small scale in north-eastern Queensland.

Although many rainforest types are represented in the nature conservation reserve system, vine thickets and scrubs are under-represented. For example, five of the sixteen rainforest assemblages in the Northern Territory are not currently reserved. Some assemblages are found only on Aboriginal land of which a part is formally protected, for example in Gurig and Kakadu National Parks, but others are not protected, such as those on the Tiwi Islands.

A significant area of the wet tropics of north Queensland was given World Heritage status in 1988, conferring a high level of protection for the tropical

rainforests included, although permitting the continuation of certain land uses, particularly on privately owned land.

## Threats

MAJOR threats to the monsoonal tropical rainforests are weeds, fire, grazing and feral animals which increase the risk of damage, or inhibit natural regeneration through a variety of disturbances such as trampling, eating and digging. The fragmented nature of these forests exacerbates these impacts and poses a considerable management challenge. Control of known or suspected exotic plants requires better management strategies to prevent them becoming major weeds.

Poaching of both plants and animals from rainforests is a serious threat, especially for rare or endangered species.

Clearing for agriculture was the major threat to wet rainforest found on coastal lowland areas with rich soil, and still is to the dry scrubs in eastern Australia. However, some relatively large areas of wet rainforest remain, such as those between Townsville and Cooktown. Numerous smaller patches exist as remnants which have survived climate change, fire and clearing, or in pockets where the topography provides a suitable micro-environment within areas generally unsuitable for rainforest.

High numbers of tourists visiting rainforests which are not adequately managed can significantly degrade such sites. Well designed access and other facilities have relatively little impact on the rainforests. Detailed studies of the impact of tourists on rainforests are currently under way in north Queensland.



Cassowary, North-east Queensland

H&H Beste



The scarlet fruit of the vine *Conarus conchicarpus*, of North Queensland

J. Wrigley

## Outlook

THE conservation of tropical rainforest on public land appears satisfactory with certain exceptions. Certain dry scrubs in Queensland are not protected and neither are a number of rainforest types in the Northern Territory. In Western Australia, most rainforest types have been proposed for legal protection, but the process is not complete. In each State there are Acts of Parliament which provide mechanisms for adequately conserving these forest types.

The deleterious effects of fire and weed invasion of scrubs and vine thickets require urgent attention. Practical management plans for protecting rainforest on private land are needed, as are practical guidelines on the satisfactory management of high concentrations of tourists visiting rainforest sites.

The Wet Tropics Management Authority, a joint initiative of the Commonwealth and Queensland Governments, was formed in 1990 to provide for the protection, conservation, presentation, rehabilitation and transmission to future generations of the Wet Tropics of the Queensland World Heritage Area. Good management for conservation and tourism should now be possible for this area.

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## Other proposed titles in this series

Lancewood                      Karri  
River Red Gum                Cool temperate rainforest



Colin Totterdell

Monsoon rainforest, South Alligator River  
Kakadu National Park, Northern Territory

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Front cover: North-east Mt Bellenden Ker Range, Queensland

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