



Australian Government

Bureau of Rural Sciences



MARCH 2004

REVISED EDITION

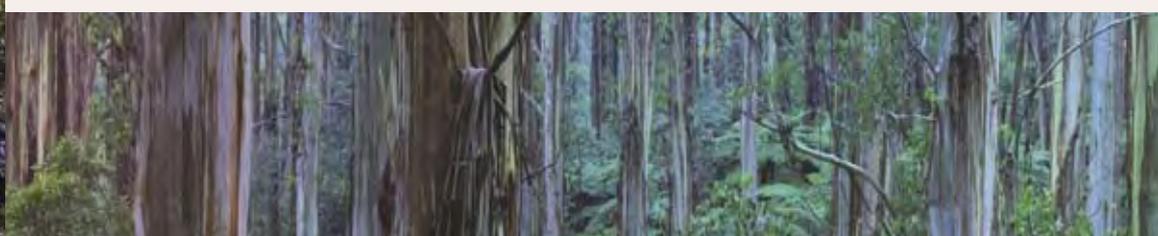


SCIENCE *for* DECISION MAKERS

Old Growth Forests in Australia

CONSERVATION STATUS AND SIGNIFICANCE FOR TIMBER PRODUCTION

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Science for Decision Makers is a series published by the Bureau of Rural Sciences. It describes the latest developments in scientific advice, assessments or tools relating to agricultural, fisheries and forestry industries, including their supporting communities.

Its purpose is to make rural science more accessible to those needing to quickly understand the benefits and implications of the most recent research as a basis for decision-making.

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Key Points

1 Management and use of old growth forests is a matter of continuing public debate. This paper describes the conservation status and contribution to wood supply of old growth in Australia.

2 The 1992 National Forest Policy Statement defined 'old growth' as forest that is ecologically mature and subjected to negligible unnatural disturbance such as logging, roading and clearing.

3 Old growth forests contain relatively large, old trees and more habitat features such as hollows, dead standing trees and logs than other growth stages.

4 Although well surveyed in regions where Comprehensive Regional Assessments (CRAs) were conducted for Regional Forest Agreements (RFAs), there has been no comprehensive survey of old growth forests across Australia. Surveys undertaken for RFAs identified over 5.2 million hectares of old growth forests in those regions.

5 As a result of the RFAs and other processes, 3.7 million hectares of old growth forest are now in conservation reserves, 71 per cent of the total area of old growth in CRA/RFA regions.

6 Old growth forests constitute about 20 per cent of the public native forest area available for wood supply in timber producing regions in Tasmania and up to 15 per cent in parts of Victoria and New South Wales. Their contribution to short-term high quality sawlog supply is considerably higher than this level in those regions.



Introduction

This paper reviews definitions, current conservation status and the contribution to wood supply of old growth forests in Australia to inform debate on future management of these forests.

Australia has nearly 165 million hectares of native forests (Figure 1). Native forests vary from dense, tall forests dominated by eucalypt or rainforest species to open short woodland and mallee formations. These forests provide a wide range of values, benefits and services to the Australian community such as habitat for many kinds of plants and animals, clean water, soil protection, spiritual, recreation, aesthetic and wilderness values. Commercial uses of native forests include timber production, grazing, honey production, tourism, seed and foliage collection and mining.

Some native forests are described as 'old growth'. Management and use of old growth forests is a matter of continuing public debate in Australia and in other parts of the world. Old growth forests are considered significant because they have habitat, nature conservation and aesthetic values that are not found in other forest areas. They also provide an important resource for the timber industry in some parts of Australia.

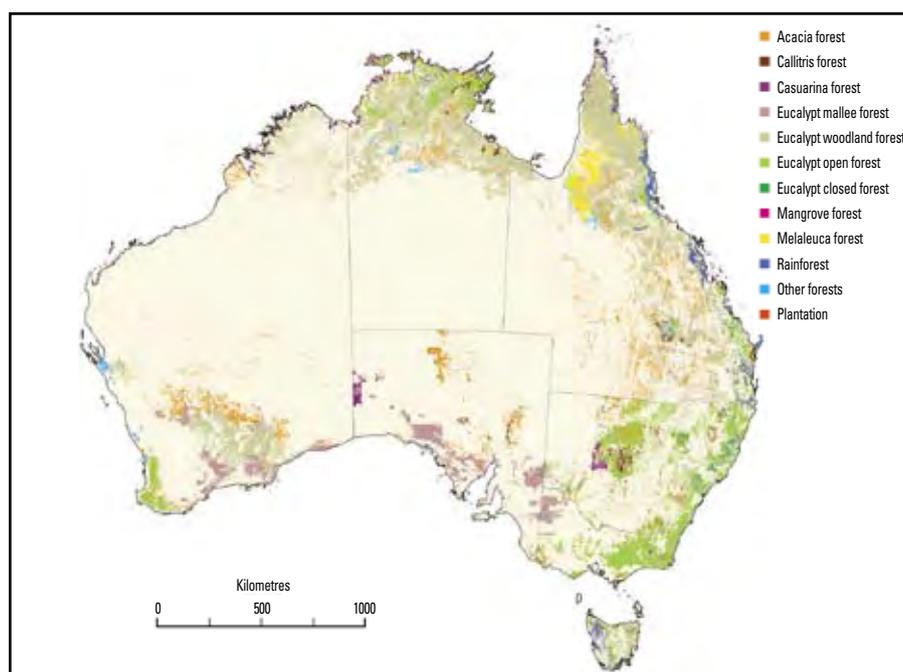
What are Old Growth Forests?

Forests are dynamic and go through stages of development following disturbances such as fire, storms or timber harvesting. The term 'old growth' has been used in forest management for some time. It became more widely used to describe Douglas fir (*Pseudotsuga menziesii*) dominated forests in northwestern USA that had reached later stages of development (Franklin *et al.* 1981).

Old growth forests have a layered structure with large overstorey trees, a well-developed understorey of other tree species, shrubs and ecological features such as dead standing trees and large logs on the forest floor. A number of wildlife species are reliant on these types of forest because of the range of nesting hollows and greater structural complexity they have in comparison with forests in earlier stages of development.

Other growth stages, such as regrowth (when the forest is younger and the trees are actively growing) are also important for habitat and conservation. Some wildlife species in Australia, such as the Leadbeater's Possum, require more than one growth stage for their survival: one for nesting and another for

FIGURE 1 Forest Cover In Australia By Dominant Genera.



Source: National Forest Inventory

feeding. Thus, it is important that a mosaic of growth stages is present in the landscape to ensure the maintenance of many species.

In Australia, eucalypt forests with similar canopy structures to old growth coniferous forests in northwest USA can be found in cooler, wetter parts of the country where disturbances such as fire are relatively infrequent. Applying the concept of old growth in drier regions where fire is frequent is more difficult. Older forests in these areas are often less diverse, with a canopy of older trees (often with hollows), a sparse understorey and ground cover of native grasses. Overstorey species generally do not develop the same crown characteristics found in tall eucalypt forests in wetter areas.

It has been argued that recent occurrence of disturbances such as fire does not preclude forests from having values associated with old growth (Burgman 1996). Multi-aged eucalypt forests and the presence of old hollow bearing trees that provide habitat for many wildlife species can be a consequence of fire disturbance.

Defining Old Growth Forests

In Australia, the 1992 National Forest Policy Statement (NFPS) made specific provision for the protection of old growth forests. The NFPS initiated a process for undertaking assessments of forests for conservation values, including old growth values. A working group of state and Australian Government agencies took the NFPS definition into consideration in developing a definition that was accepted by all governments (JANIS 1997).

Old growth forest is ecologically mature forest where the effects of disturbances are now negligible.

Further development of this definition enabled consistent application across different forest types (Pitman *et al.* 1996). Ecologically mature forests, as identified within the definition, are defined by the characteristics of older

growth stages. This includes the presence of trees in a condition that would be expected in such a forest type where there have been no disturbances for a long period and a well-

developed understorey of shrubs, herbs and grasses. This includes trees in an over mature or senescent growth phase that are no longer actively growing or that may be reducing in size due to crown dieback and branch shedding. Features such as hollows in which fauna can nest are usually also more prominent.

Forest composition and structure vary considerably across Australia and therefore different states adopted different definitions for assessment of old growth forest values. No definitions were developed or assessments undertaken in the Australian Capital Territory, South Australia or the Northern Territory. Definitions adopted for Comprehensive Regional Assessments (CRAs) were:

Tasmania

The JANIS definition was adopted. For the purposes of mapping old growth forests a detailed rule set was developed for different forest types involving crown senescence characteristics and levels of disturbance. For details refer to Tasmanian Public Land Use Commission 1996. Tasmanian-Commonwealth Regional Forest Agreement, Environment and Heritage Report, Vol. 1, Background Report, Part C.

Victoria

Forest which contains significant amounts of its oldest growth stage in the upper stratum—usually senescing trees—and has been subjected to any disturbance, the effect of which is now negligible. A maximum regrowth crown cover of 10 per cent applied. Areas with regrowth crown cover of more than 10 per cent are almost always associated with significant unnatural disturbance.

New South Wales

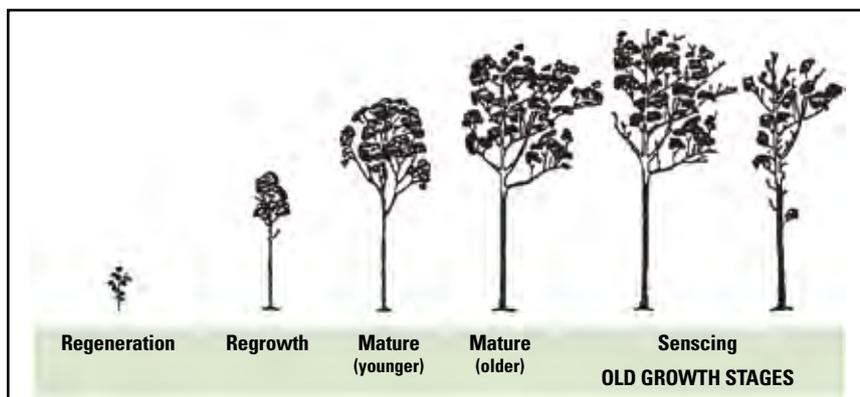
JANIS (1997) definition was adopted but a maximum regrowth crown cover of 30 per cent was used to define senescing forests.

Western Australia

Forest that is ecologically mature and which has been subjected to negligible past disturbance.



FIGURE 2 Tree Growth Stages for Eucalypts on High Quality Sites (e.g. Mountain Ash (*Eucalyptus Regnans*) in Australia).



Source: Jacobs (1955)

Attributes of Old Growth Forests

The following attributes can generally be used to describe old growth forests in Australia.

Structure and Composition Properties

- An overstorey dominated by relatively large trees
- An overstorey dominated by relatively old trees with hollows and other characteristics of late mature, over-mature or senescent trees (Figure 2).
- A well-developed understorey of trees, shrubs and herbs.
- Large fallen logs and woody debris.
- Low rates of change in composition and structure.

Functional Properties

- Low average tree growth rates, with growth in young trees balanced by death of older trees.
- High level of biomass in live trees, dead trees, logs and forest floor.
- Lower water transpiration, higher water flow to streams and higher soil moisture than younger growth stages.

Other Properties

- Absence of recent large-scale disturbance such as fire, logging, grazing etc.
- Aesthetic values.
- Sufficient size of forest stand that is likely to remain intact in the long-term.

Conservation Status of Old Growth Forests

Protection of old growth forest was identified as a priority in the 1992 NFPS. Following a process of consultation between state and federal governments the following reservation targets were agreed:

1. For those forest types where old growth forest is rare or depleted (defined as less than 10 per cent of the current distribution of its forest type), all viable examples should be protected (100 per cent target)
2. For other forest types, 60 per cent of old growth forest should be protected, with appropriate flexibility in the target applied to ensure:
 - old growth forest representation is from across its range;
 - high quality habitat areas are included;
 - reserve design is appropriate (i.e. can be managed practically);

TABLE 1 Area of Old Growth Forest in CRA/RFA Regions by Ownership and Conservation Status¹.

CRA/RFA Region	Total area of Region (ha)	Area of Forest (ha)	Area of Old Growth Forest			Area of Old Growth Forest in Reserves			
			On Private or Unresolved Tenure ² (ha)	On Public Land (ha)	Total (ha)	Formal (ha)	Informal (ha)	Total (ha)	% old Growth Reserved
South-East QLD	6,180,000	3,230,000	74,000	196,000	270,000			196,000	73%
South-West WA	4,257,000	2,121,000	N/A	331,000	331,000	308,000	23,000	331,000	100%
VICTORIA									
East Gippsland	1,214,000	1,075,000	N/A	225,000	225,000	121,000	32,000	153,000	68%
Central Highlands	1,125,000	709,000	N/A	26,000	26,000	14,000	8,000	22,000	85%
North East	2,318,000	1,326,000	N/A	259,000	259,000	99,000	48,000	147,000	57%
Gippsland	2,652,000	1,510,000	N/A	209,000	209,000	89,000	50,000	139,000	67%
West	5,776,000	1,124,000	N/A	122,000	122,000	77,000	33,000	110,000	90%
Vic Sub-total	13,085,000	5,744,000	N/A	841,000	841,000	400,000	171,000	571,000	68%
NSW									
Eden	813,000	724,000	17,000	81,000	98,000	66,000	4,000	70,000	71%
Upper North East	3,907,000	2,312,000	234,000	421,000	655,000	237,000	134,000	371,000	57%
Lower North East	5,800,000	3,288,000	253,000	777,000	1,030,000	646,000	93,000	739,000	72%
Southern	4,510,000	2,665,000	140,000	613,000	753,000	525,000	37,000	562,000	75%
NSW Sub-total	15,030,000	8,989,000	644,000	1,892,000	2,536,000	1,474,000	268,000	1,742,000	69%
TASMANIA ³	6,800,000	3,169,000	115,000	1,124,000	1,239,000	777,000	72,000	851,000	69%
TOTAL	45,352,000	23,253,000	833,000	4,384,000	5,217,000			3,691,000	71%

¹ From National Forest Inventory 2003, WA Forest Management

² Private forests not assessed for old growth in WA or Victoria

³ Areas for Tasmania are based on 2001 data and do not include changes resulting from the 2005 Tasmanian Community Forest Agreement.

- largest and least fragmented areas are protected; and
- community needs for recreation and tourism are met.

These criteria, along with targets to ensure all forest communities are appropriately represented in reserves and that high quality wilderness areas are protected, were applied in developing Regional Forest Agreements.

As a result of recent state government policies, all old growth on public land is in formal or informal reserves in South-East Queensland and Western Australia.

Consequently, 3.7 million hectares of old growth forest are now in formal and informal reserves (Table 1, Figure 3). This constitutes 71 per cent of the total of the 5.2 million hectares of old growth forest in CRA/RFA regions—an increase of 1.2 million hectares since 1995.

The percentage of old growth in conservation reserves varies across regions, from 57 per cent in North East Victoria and the Upper North East of NSW to over 85 per cent in the West and Central Highlands regions in Victoria.

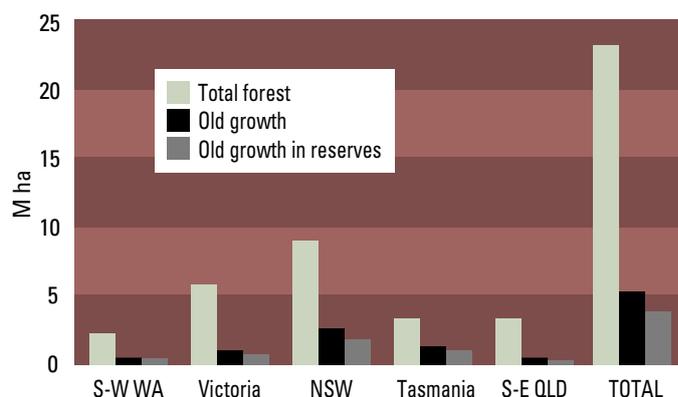
Old Growth Forests and Regional Native Forest Wood Supply

This reserve status represents a significant increase in the conservation status of old growth forests in Australia. Old growth forests also make a significant contribution to regional wood supply from native forest for industry. As a result of conversion of timber supply from old growth to regrowth and increasing production potential from younger regrowth forests this contribution will decline over time.

Except for Tasmania, there is little publicly available information providing precise estimates of the area of old growth in forests scheduled for timber harvesting.



FIGURE 3 Areas of Forest, Old Growth Forest and Areas of Old Growth in Reserves for CRA/RFA Regions.



Analysis of CRA reports and those from state forest management agencies indicates that (Table 2):

- About 20 per cent of the area of public native forest available for wood supply in Tasmania is old growth. Less than 15 per cent is old growth in East Gippsland, in Victoria and Southern Region in NSW.
- Less than 10 per cent of the public forest area available for wood production in the Gippsland Central Highlands and West RFA regions in Victoria and Eden in NSW is old growth.
- Old growth forests are now a very minor source of wood supply in Queensland and WA.
- Wood supply projections from Tasmania indicate that old growth and mature forests will provide 30–50 per cent of timber volumes for the next 50 years.

TABLE 2 Approximate Area of Native Forest Available for Timber Production on Public Land by Growth Stage.

CRA/RFA Region	Estimated Sawlog Yields m ³ /yr	Approximate Area Available for Timber Production (ha)	% Old Growth in Area Available ¹	% Mature and Overmature (inc Old Growth where Applicable)	% Regrowth	% Uneven Aged and Other
VICTORIA²						
East Gippsland	143,000	211,000	<15	39	41	20
Central Highlands	250,000	164,000	<5	20	80	0
North East	52,500	62,000	<15	74	24	2
Gippsland	92,000	102,000	<7	27	64	9
West	44,200	87,000	<10	36	45	19
NSW³						
Eden	25,000	152,000	<10	—	100	—
Upper North East	109,000	180,000	0	20	20	60
Lower North East	160,000	160,000	0	20	20	60
Southern	97,500	266,000	<15	—	100	—
TASMANIA⁴	300,000	701,000	22	—	100	—
SOUTH-WEST WA⁵	190,000	848,000	0	—	100	—
SOUTH-EAST QLD⁶	55,000	208,000	0	—	100	—

¹ These estimates may include areas of old growth that will not be harvested due to codes of forest practice requirements.

² Economically Accessible Resource Estimates from *Our Forests Our Future: Estimates of Sawlog Resource* Victorian Department of Natural Resources and Environment 2002, BRS estimates for North-East and Gippsland.

³ Figures supplied by NSW State Forests and from CRA reports for Eden.

⁴ From *Sustainable High Quality Eucalypt Sawlog Supply from Tasmanian State Forest. Review No.2* May 2002, Forestry Tasmania. Areas do not include changes resulting from the 2005 Tasmanian Community Forest Agreement.

⁵ From WA Forest Management Plan, December 2003.

⁶ In south-east Queensland, within the limits of mapping accuracy, all significant areas of old growth forests on public land are included in conservation reserves. Small and fragmented areas of old growth are in timber production areas, often in forest types that are excluded from logging under the Code of Practice for Native Forest Harvesting.

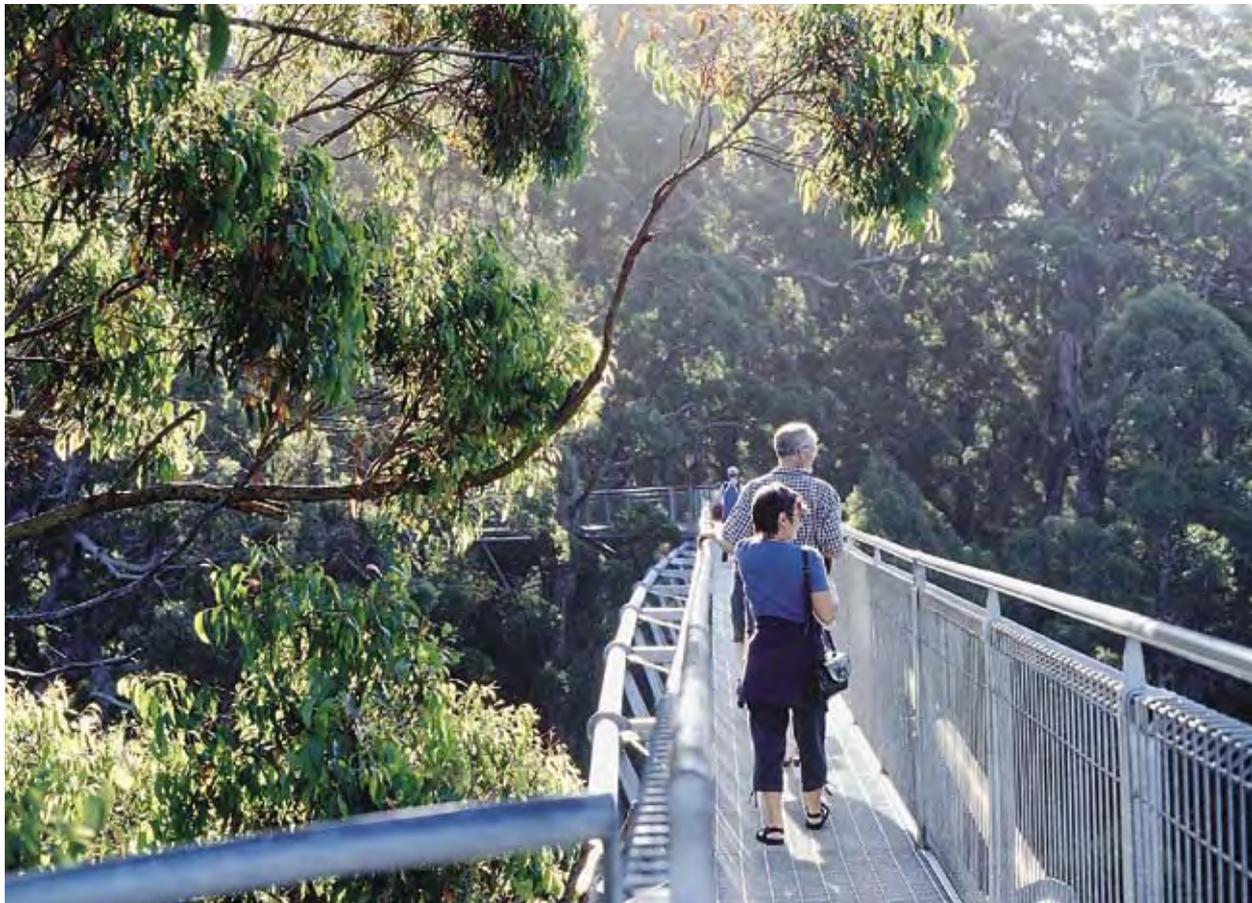
- Old growth and regrowth forests are often intimately mixed. Access to these regrowth areas is dependent on harvesting associated old growth.
- Thus, area figures alone cannot be used for assessing the impact on wood production of ceasing timber harvesting in old growth forests. Old growth forests generally contain higher timber volumes than younger growth stages. Consequently, those old growth forests planned for harvesting contribute a higher proportion to regional native forest wood supplies for industry in the short-term than indicated by their areas.
- For example, in Western Australia, State Government policy is to cease timber harvesting in old growth forests. Impacts of this policy have led to a reduction in supply of first and second grade jarrah and karri sawlogs to the timber industry from 544,000 m³ to 185,000 m³.

CONCLUSIONS

Old growth forests have been subject to considerable research and investigation over the last ten years since the signing of the National Forest Policy Statement.

Seventy-one per cent of identified old growth forests in areas covered by Regional Forest Agreements (including the state based agreement in South-East Queensland) are now in conservation reserves.

Old growth forests continue to make a substantial contribution to wood supplies in the short to medium term in a number of important timber production regions around Australia.





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