

5 *Forest Policy and Management*



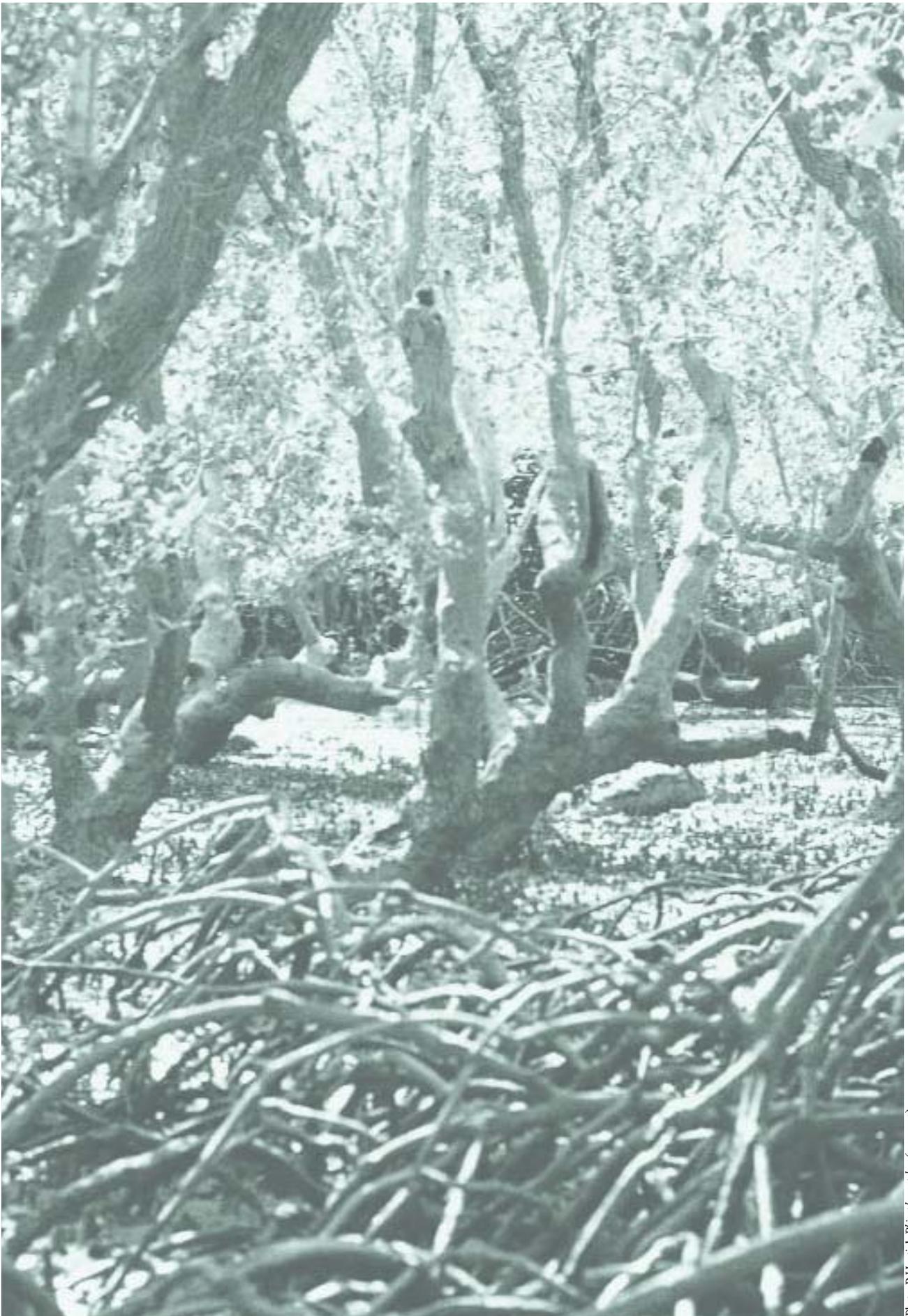


Photo: R. Hnatuk. *Rhizophora apiculata* (mangrove)

Forest Policy and Management

All forests in Australia are controlled by some level of policy and management regime. These controls vary from strict, comprehensive systems on public multiple-use forests and conservation reserves to limited controls on some forms of other crown land, leasehold land and private land.

This chapter sets out the regulations, policies and management practices that influence Australia's forests. By far the largest body of information is available for forests with multiple-use tenure, but forests with other tenures are addressed where possible.

Regulation and policy

The management of forests in Australia is the responsibility of the States because it is a function not explicitly delegated to the Commonwealth by the Australian Constitution. Through Acts of Parliament (Table 45 provides a list of those most relevant to forest management) and government policy, State and Territory governments establish the framework under which public and private forests are managed. These governments are also directly responsible for the management of large areas of public forest through various agencies. The summaries of key information at the end of this report show the agencies in each State and Territory with responsibility for forest management, and their institutional evolution. Since the proclamation of their legislation, each State has managed its forests according to plans and policies developed in accord with that legislation.

The Commonwealth is responsible for ensuring that Australia's international obligations are met and that provisions of Commonwealth legislation are satisfied. Such legislation relevant to forest management and policy includes the *Australian Heritage Commission Act 1975*, the *Australian National Parks and Wildlife Conservation Act 1975*, the *Export Control Act 1982*, the *World Heritage Properties Conservation Act 1983*, the

Endangered Species Protection Act 1992, and the *Natural Heritage Trust of Australia Act 1997*.

State and Territory policy initiatives

A large number of initiatives related to forests have been implemented at the State and Territory level in recent years. A sample is presented here under several headings.

Industry development

In New South Wales, the Timber Industry (Interim Protection) Act of 1992 was enacted with the aim of maintaining a viable timber industry while providing for a full environmental impact assessment of timber harvesting operations. Victoria has implemented a range of its Timber Industry Strategy recommendations, while Queensland's Greater Planning Certainty Policy, introduced in 1993, aimed, among other things, to increase planning certainty for forest industries. The 1991 Forests and Forest Industry Strategy in Tasmania led to the development of State-level multilateral forest policy and management agreement covering the State's forests and associated industries. In the Northern Territory, the Parks and Wildlife Commission has commenced a project aimed at encouraging the harvesting of *Erythrophleum chlorostachys* (ironwood) from its forests with minimum impact on associated flora and fauna assemblages.

Environmental protection and conservation

While informal prescriptions for environmental protection and conservation have been in place in many multiple-use forests in Australia since the 1970s, the country's first formal code of forest practice was enacted in Tasmania in the late 1980s; it regulates operations on all public and private forests. Other States have since prepared and implemented similar codes, including Victoria, which now has codes of forest practice for

Table 45: Key Acts of Parliament relevant to forest management at State, Territory and Commonwealth level

State or Territory	Act	State or Territory	Act
Australian Capital Territory	ND	Victoria	<i>Forests Act 1958</i>
New South Wales	<i>Forestry Act 1916</i>		<i>Land Act 1958</i>
	<i>Soil Conservation Act 1938</i>		<i>Mines Act 1958</i>
	<i>Bush Fires Act 1949</i>		<i>Environment Protection Act 1970</i>
	<i>National Parks and Wildlife Act 1974</i>		<i>National Parks Act 1975</i>
	<i>Heritage Act 1977</i>		<i>Environment Conservation Council Act 1977</i>
	<i>Environmental Planning and Assessment Act 1979</i>		<i>Conservation, Forests and Lands Act 1987</i>
	<i>Wilderness Act 1987</i>		<i>Crown Lands (Reserves) Act 1987</i>
	<i>Endangered Fauna (Interim Protection) Act 1991</i>		<i>Flora and Fauna Guarantee Act 1988</i>
	<i>Timber Industry (Interim Protection) Act 1992</i>		<i>Water Act 1989</i>
	<i>Threatened Species Conservation Act 1995</i>		<i>Forests (Timber Harvesting) Act 1990</i>
	<i>Timber Plantations (Harvest Guarantee) Act 1995</i>		<i>Aboriginal Lands Act 1991</i>
	<i>Pollution Control Acts</i>		<i>Heritage Rivers Act 1992</i>
Northern Territory	<i>Control of Roads Act 1980</i>		<i>Victorian Plantations Corporation Act 1993</i>
	<i>Environmental Assessment Act 1982</i>		<i>Catchment and Land Protection Act 1994</i>
	<i>Soil Conservation and Land Utilisation Act 1990</i>		<i>Water Industry Act 1994</i>
	<i>Pastoral Lands Act 1992</i>		<i>Fisheries Act 1995</i>
	<i>Crown Lands Act 1992</i>		<i>Heritage Act 1995</i>
	<i>Parks and Wildlife Conservation Act 1993</i>	Western Australia	<i>Metropolitan Water Supply Sewerage and Drainage Act 1909</i>
Queensland	<i>Forestry Act 1959</i>		<i>Country Area's Water Supply Act 1947</i>
	<i>National Conservation Act 1992</i>		<i>Wildlife Conservation Act 1950</i>
	<i>Land Act 1994</i>		<i>Bush Fire Act 1954</i>
	<i>Environmental Protection Act 1994</i>		<i>Aboriginal Heritage Act 1972</i>
South Australia	<i>Crown Lands Act 1929</i>		<i>Rights in Water and Irrigation Act 1979</i>
	<i>Forestry Act 1950</i>		<i>Environmental Protection Act 1982</i>
	<i>National Parks and Wildlife Act 1972</i>		<i>Conservation and Land Management Act 1984</i>
	<i>Aboriginal Heritage Act 1988</i>		<i>Various mining and mineral agreement Acts</i>
	<i>Soil Conservation and Land Care Act 1989</i>	Commonwealth	<i>Environment Protection (Impact of Proposals) Act 1974</i>
	<i>Native Vegetation Act 1992</i>		<i>Australian Heritage Commission Act 1975</i>
	<i>Wilderness Protection Act 1992</i>		<i>Export Control Act 1982</i>
	<i>Environment Protection Act 1993</i>		<i>World Heritage Properties Conservation Act 1983</i>
	<i>Heritage Act 1993</i>		<i>Endangered Species Protection Act 1992</i>
	<i>Water Resources Act 1997</i>		
Tasmania	<i>Forestry Act 1920</i>		
	<i>National Parks and Wildlife Act 1970</i>		
	<i>Aboriginal Relics Act 1975</i>		
	<i>Crown Lands Act 1976</i>		
	<i>Forest Practices Act 1985</i>		
	<i>Private Forests Act 1994</i>		
	<i>Historic Cultural Heritage Act 1995</i>		
	<i>Threatened Species Protection Act 1995</i>		

ND – No data.

Source: National Forest Inventory (1997).

timber production on public and private land and fire management on public land (see section on codes of forest practice and Table 48 later in this chapter).

The 'Western Shield' fox control program implemented by the Department of Conservation and Land Management in Western Australia is having a dramatic effect on fox numbers on forested lands, resulting in increased numbers of small native mammals and birds. In New South Wales, the 1995 State Environmental Planning Policy 46 was developed to control the rate of vegetation clearing, including the clearing of forests, and is expected to help conserve large areas of forest on private and leasehold lands.

Management planning for multiple-use forests and in conservation reserves is an important part of environmental protection; this is discussed later in this chapter.

Miscellaneous initiatives

In 1997 the Queensland Department of Primary Industries (Forestry) introduced an environmental management system; it hopes that by the year 2000 this system will be at a level at which it can be independently audited and certified to international standards. In the Northern Territory, the Tiwi people established a plantation of *Acacia* species recently on Melville Island in an effort to develop a viable wood-based business. The Parks and Wildlife Commission assisted by providing loans, conducting research and managing some of the associated activities.

Commonwealth initiatives

The Commonwealth Government funds a number of programs aimed at assisting States and Territories in the management of their natural resources. Some of these are directed specifically at forests, while others are more general but have some applicability to the forest estate.

The Natural Heritage Trust is a Commonwealth Government initiative funded by the partial sale of Telstra, the national telecommunications organisation. It will provide \$1.25 billion over four years towards projects aimed at maintaining and replenishing Australia's natural environmental capital. Three

Trust-funded projects of relevance to forests are: the Farm Forestry Program; the Land and Water Audit, which includes funding for the National Forest Inventory; and the National Vegetation Initiative.

The Commonwealth Government is also involved with the States and Territories in the development and implementation of a number of policy statements or initiatives. These include Plantations for Australia: the 2020 Vision, the National Biodiversity Strategy, the Wood and Paper Strategy, the regional forest agreement process and the Montreal Process Working Group. A range of other national-level programs or bodies, such as the Murray-Darling Basin Commission, contain forest-related components but are not focused primarily on them.

The Commonwealth Government funds forest research through institutions such as CSIRO and certain cooperative research centres and universities. It has also provided loans to increase the plantation resource and has management responsibilities for forested Commonwealth national parks at Kakadu, Jervis Bay, Norfolk Island and Christmas Island, and for forests on defence lands.

National Forest Policy Statement

In 1992 the Commonwealth, State and Territory governments formally agreed to a coordinated approach to broad forest policy when they signed the National Forest Policy Statement (Tasmania signed in 1995). The signatories agreed to 11 broad national goals relating to conservation; wood production and industry development; integrated and coordinated decision-making and management; private native forests; plantations; water supply and catchment management; tourism and other economic and social opportunities; employment, workforce education and training; public awareness, education and involvement; research and development; and international responsibilities.

Regional forest agreements

The National Forest Policy Statement made provision for a joint forest planning exercise,

known as a comprehensive regional assessment (CRA) to be carried out across parts of the forest estate. The Commonwealth and each State government, in consultation with stakeholders and using results of the CRA, negotiate an agreement (called a regional forest agreement, or RFA) that sets out how the forests of the region under assessment are to be managed and used over a period of up to 20 years. The agreement in each State will be implemented through the State planning and policy mechanisms provided for in their legislation. The progress of each agreement is to be reviewed at least every five years.

RFAs do not cover the entire forest estate: in broad terms their scope is limited to those regions for which Commonwealth woodchip export licences are or may be required. Map 15 (see colour section in back of book) shows those regions to which RFAs will be applied.

By April 1998 the Commonwealth and State governments had signed three RFAs: those covering Tasmania and the East Gippsland and Central Highlands regions of Victoria. Agreements for Eden (New South Wales), Western Australia, North-east Victoria and Queensland are likely to be signed by the end of 1998. All RFAs are expected to be completed by the year 2000.

Rare or threatened species

Individual States and Territories have legislation to list and protect endangered species, while nationally endangered species are listed in Schedule 1 of the Commonwealth *Endangered Species Protection Act 1992*. The Commonwealth is obliged to prepare a recovery plan for each species listed as vulnerable and endangered in Schedule 1 of the Act; some States and Territories have similar requirements for species listed in their legislation.

Information on rare or threatened species will be used in the design of a comprehensive, adequate and representative conservation reserve system. However, it will not be possible to include or conserve all rare and threatened species in the permanent reserve system. Thus, their management on both public and privately owned lands must be separately addressed. Most States have voluntary conservation agreements (such as the Land for Wildlife Scheme) to assist in conservation management on privately owned lands. State and Territory agencies participate in coordinated programs to protect rare or threatened plants and animals. In addition, field operational procedures in many multiple-use forests are specifically designed to accommodate the need to protect populations and habitats of rare or threatened plants and animals.

Box 12: Principles considered by regional forest agreements (RFAs)

In reporting on ecologically sustainable forest management in the regional forest agreement process, the following principles are used:

- maintain and enhance multiple socio-economic benefits to meet the needs of societies;
- protect and maintain biodiversity;
- maintain the productive capacity and sustainability of forest ecosystems;
- maintain forest ecosystem health and vitality;
- protect soil and water resources;
- maintain forest contribution to global carbon cycles;

- maintain natural and cultural heritage values;
- maintain the full suite of forest values for present and future generations; and
- utilise the precautionary principle for prevention of environmental degradation.

In addition to these principles, regional forest agreements consider the following:

- the interests of Indigenous communities; and
- old-growth forests, wilderness areas and forest required for a comprehensive, adequate and representative forest reserve system.

Wilderness

For those forests covered by the regional forest agreement process, there is agreement that 90 per cent or more of areas identified as wilderness are to be protected. Wilderness is protected by legislation in New South Wales and Victoria and is recognised in management planning in Tasmania.

Greenhouse responses

Commonwealth, State and Territory governments have proposed a number of policy responses aimed at reducing Australia's overall greenhouse gas emissions. These include the National Greenhouse Gas Response Strategy (1992), Greenhouse 21 C (1995) and the draft National Greenhouse Strategy (1997). Specific measures relevant to forests include the sustainable management of native forests and plantations, a proposed trebling of the 1995 plantation area to 3 million hectares (under Plantations for Australia: the 2020 Vision), and revegetation (under programs such as the National Vegetation Initiative). If such measures *were* implemented, it has been estimated that the forestry and land use change sectors could, by the year 2020, reduce Australia's total annual CO₂ emissions by some 70 megatonnes. Proposed restrictions on vegetation clearing would increase this sink capacity even further.

At the Conference of Parties to the Climate Change Convention in Kyoto, Japan, in 1997, emission reduction targets were redefined, allowing differentiation between countries. Australia's agreed target was to reduce overall emissions to 8 per cent above 1990 levels by the first commitment period of 2008 to 2012. The Kyoto Protocol also stated that only net emissions from land use changes since 1990 (including trees planted or removed) could be included in calculations, although it remains uncertain whether net emissions from, for example, forests managed on set rotations or regeneration within national parks will be included. A monitoring and prediction system of carbon emissions and sinks would require the use of remotely sensed data and biospheric models (such as for soil carbon, growth and decomposition).

International agreements with implications for forest management in Australia

Australia is signatory to a number of international agreements, some of the more significant of which are listed in Box 13.

Perhaps the most important international process in the context of this report is a non-legally binding agreement known as the Montreal Process. Within this, 12 countries, including Australia, have been working to develop criteria and indicators for the sustainable management of temperate (and boreal) forests. The Montreal Process Working Group comprises Argentina, Australia, Canada, Chile, China, Japan, Mexico, New Zealand, Republic of Korea, Russian Federation, United States of America and Uruguay. These countries cover five continents and together represent over 90 per cent of the world's temperate and boreal forests, as well as some tropical forests.

In February 1995 the Montreal Process Working Group endorsed a statement known as the 'Santiago Declaration', including a comprehensive framework of seven criteria and 67 indicators (see Box 14). These provide a common understanding of what is meant by sustainable forest management. The first six criteria deal specifically with forest conditions, attributes or functions, and the values or benefits associated with the environmental, social and economic goods and services that forests provide. The seventh criterion assesses the legal, institutional, economic and research frameworks of a country that facilitate the conservation and sustainable management of forests covered by the first six criteria. The criteria and indicators are tools for assessing national trends in forest conditions and management, and provide a common framework for describing, monitoring and evaluating progress towards sustainability at the country level. Australia produced its first report against the indicators in June 1997.

Box 13: International forest-related agreements, forums or statements of relevance to Australia

- Food and Agriculture Organization of the United Nations, 1945
- Rio Declaration and Agenda 21, 1992
- Statement of Forest Principles, 1992
- United Nations Framework Convention on Climate Change, 1992
- United Nations Framework Convention on Biological Diversity, 1992
- Commission for Sustainable Development, 1992
- Montreal Process and Santiago Declaration, 1994
- General Agreement in Tariffs and Trade (GATT), 1947, and World Trade Organisation, 1995
- Convention concerning the Protection of the World Cultural and Natural Heritage, 1972 (World Heritage Convention)
- Convention on Wetlands of International Importance etc, 1971 (Ramsar Convention)
- Man and the Biosphere Programme, 1971
- Convention on the Conservation of Migratory Species of Wild Animals, 1979 (Bonn Convention)
- Convention on International Trade in Endangered Species of Wild Fauna and Flora, 1973 (Washington)
- The Convention on Conservation of Nature in the South Pacific, 1976 (Apia Convention)
- International Tropical Timber Agreement, 1983
- Convention for the Protection of the Natural Resources and the Environment of the South Pacific Region, 1986, Noumea
- CAMBA (1986) and JAMBA (1974) Agreements (bilateral agreements with China and Japan, respectively, that reinforce the Ramsar Convention)

Forest management in native forests

The level of forest management varies across Australia, with most information on forest management available for multiple-use forests. Here we focus on a few key policies and procedures that are comparable on a national basis.

Sustainable forest management

Sustainable forest management is a complex concept and there is no single widely used definition. Public forest managers and some private forest managers accept that the concept of sustainability includes the wide diversity of forest values such as those enunciated in the Montreal Process criteria and indicators (see 'International agreements with implications for

forest management in Australia' above).

Managing forests for wood production on public land and some private land involves also managing the forests for water, biodiversity and certain cultural values. Criteria and indicators are not direct measurements of sustainable forest management but, taken together, they allow an assessment of whether and to what extent forest management is achieving an adequate level of sustainability. The nature of the measurements, analyses and reporting of indicators varies with the level of reporting: the information needed by on-the-ground managers will differ in detail and substance from that needed for regional, State, Territory or national requirements. Nonetheless, for reasons of efficiency and effectiveness, there should be compatibility between these different levels of reporting.

Box 14: Montreal Process criteria and indicators for the conservation and sustainable management of temperate and boreal forests

Criteria	Indicators
1. biological diversity	
1.1 ecosystem diversity	1.1.a forest types 1.1.b age/successional stage of types 1.1.c protected areas 1.1.d protected area by age/successional class 1.1.e fragmentation
1.2 species diversity	1.2.a no. forest-dependent species 1.2.b viability of populations
1.3 genetic diversity	1.3.a species with diminished habitat range 1.3.b population levels across range
2. productive capacity	2.1.a area of timber production forest 2.1.b merchantable and non-merchantable growing stock 2.1.c area of exotic and native plantations 2.1.d wood products versus sustainable production level 2.1.e non-wood products versus sustainable production level
3. ecosystem health and vitality	3.1.a impact of processes/agents 3.1.b impact of air pollution/ultraviolet B 3.1.c extent of diminished biological components
4. soil and water resources	4.1.a area of soil erosion 4.1.b protective areas/functions 4.1.c streamflow variations 4.1.d soil chemical properties 4.1.e soil physical properties 4.1.f stream biological diversity 4.1.g accumulation of toxic substances
5. global carbon cycles	5.1.a ecosystem biomass 5.1.b ecosystem contribution to carbon budget 5.1.c forest product contribution to carbon budget
6.1 socio-economic benefits	6.1 production/consumption 6.1.a value/volume of wood products 6.1.b value/volume of non-wood products 6.1.c per capita supply and consumption 6.1.d percentage of gross domestic product 6.1.e extent of recycling 6.1.f supply/use of non-wood products
6.2 recreation and tourism	6.2.a available forest area 6.2.b facilities available 6.2.c visitor days
6.3 investment	6.3.a value of investment 6.3.b R&D expenditure 6.3.c technology (use and adoption) 6.3.d rate of return
6.4 cultural, social and spiritual	6.4.a area protecting cultural, social, spiritual values 6.4.b non-consumptive use values
6.5 employment and community	6.5.a direct and indirect employment 6.5.b wage and injury rates 6.5.c forest community viability 6.5.d area used for subsistence
7. effectiveness of legal, institutional and economic framework	
7.1 legal framework	7.1.a property rights, tenure, traditional rights of Indigenous peoples, dispute resolution 7.1.b planning, assessment, policy review for range of values 7.1.c public participation in decisions/policy and access to information 7.1.d best practice codes 7.1.e conservation – environmental, social, cultural and/or scientific values
7.2 institutional framework	7.2.a public awareness/education 7.2.b planning, assessment, policy review (including cross-sectoral elements) 7.2.c human resource skills 7.2.d physical infrastructure 7.2.e regulation, guidelines, law enforcement
7.3 economic framework flows	7.3.a investment, taxation, regulatory environment, capital flows 7.3.b non-discriminatory trade policies
7.4 capacity to measure conservation	7.4.a data availability 7.4.b scope, frequency, statistical reliability of inventories/assessments 7.4.c compatibility with other countries
7.5 capacity for and application of R&D	7.5.a scientific ecosystem understanding 7.5.b development of national accounting methodologies for social costs/benefits, and resource depletion 7.5.c impact of technology 7.5.d human impact prediction 7.5.e climate change impact prediction

Management of multiple-use forests

Forest management agencies

The agencies in each State and Territory with responsibility for forest management, including that employed in multiple-use forests, and their institutional evolution have been summarised and presented with summaries of key information at the end of this report.

Corporatisation

During the 1990s most State and Territory forest agencies changed their mode of organisation, based on the need for greater transparency and accountability for revenue-generating operations. The major result was the corporatisation as business units of those functions that focus primarily on timber production and sale. The degree of corporatisation varies between agencies.

Silvicultural systems

The choice of silvicultural system in forest harvesting depends on the objectives set for the forest (for example, to promote growth, regeneration or forest health) and the requirements of the tree species involved. Silvicultural methods can be distinguished by the degree to which harvesting exposes the forest floor to sunlight. At one extreme, clear-felling may involve the removal of the entire stand of trees in discrete patches of 10–50 hectares; at the other, single trees may be removed at dispersed locations throughout the forest. Table 46 shows the silvicultural systems employed for various forest groups in multiple-use forests in each State.

Management plans

A forest management plan states the objectives of management that will be pursued in a given forest over a specified time period. Table 47 shows the area of public forest of various tenures, including multiple-use forests in each State or Territory, covered by management plans in 1998. In New South Wales, mandatory environmental impact statements that provide inputs to management and opportunities for public comment precede harvesting. Most other States have processes that allow public involvement in the

development of management plans and operational harvesting plans.

Codes of forest practice

The term ‘code of forest practice’ describes a set of principles and standards that specify minimum acceptable practices and goals in harvesting and associated forest management operations.

With the exception of the Northern Territory, which has no multiple-use forests, all relevant agencies have codes of practice that govern activities related to the management and use of multiple-use forests. In Victoria and Tasmania, the codes also cover private forestry. Table 48 summarises the content of these codes for each State and the Australian Capital Territory. The codes are reviewed periodically and revised to reflect the results of monitoring and to respond to developments in knowledge and technology.

In some States, some aspects of forest management are addressed in separate documents, such as the code of practice for fire management on public land in Victoria. In addition, operational guidelines and specific prescriptions for silvicultural operations are often documented separately. The responsibility of ensuring that the codes of practice are adhered to lies with the management agency. Timber harvesting contractors and other forest users may be penalised for breaches of mandatory codes.

In Queensland, separate codes of practice are being developed for the major forest management and use activities. These codes are based largely on current management manuals in use by the Department of Primary Industries (Forestry).

In the Northern Territory, there is no government timber production agency. All harvesting operations are undertaken by the private sector and must be licensed. The licence governs the manner and conditions under which harvesting may occur. Licence conditions are specific to each operation, and environmental requirements are common to all licences.

Community service obligations

Agencies with responsibility for the management of multiple-use forests provide a

Table 46: Silvicultural systems employed for various forest groups, by State and Territory

RAC	State	Harvest	Habitat	Regeneration	Rotation length	Visits	
forest type		methods ⁽¹⁾	trees ⁽²⁾	methods ⁽³⁾	(years) ⁽⁴⁾	Max	Min
Rainforest	NSW	NL	NL	NL	NL	NL	NL
	NT	NL	NL	NL	NL	NL	NL
	Qld	NL	NL	NL	NL	NL	NL
	Tas	S(l/m)	√	b	2004	ND	ND
	Vic	NL	NL	NL	NL	NL	NL
	WA	NL	NL	NL	NL	NL	NL
S-W wet eucalypt	WA	T,C	√	b c f	100 - 300	4	1
S-W dry eucalypt	WA	T,S(m/g)	√	a b c	200	5	4
S-E wet eucalypt	NSW	T,S(m/h/g)	√	a b c	100 -150	3	3
	Tas	T,C,S(l/m/h)	√	a c f	80 -100	ND	ND
	Vic	T,C,S(h)	√	b c d g	80 -100	3	3
S-E ash	NSW	T,S(m/g)	√	a b c	100 -150	3	3
	Tas	T,C,S(l/m/h)	√	a c f	80 -100	ND	ND
	Vic	C	√	c d f g	80	1	1
S-E dry open forest & woodland	NSW	T,S(l/g)	√	a b	150+	3	3
	Tas	S(l/m/h)C	√	a b c	80 -100	ND	ND
	Vic	T,S(l)	√	h b	100 -120	5	2
S-E coastal eucalypt	NSW	T,S(m/g)	√	a b c	60 - 100	3	3
	Vic	T,C,S(m)	√	a b c	100 - 120	3	2
Central coastal eucalypt	NSW	T,S(l/m/h/g)	√	a b c	60 - 150	3	3
	Qld	T,S(l/h/g)	√	a b c e f	20 - 70	4	2
N-E central coastal eucalypt	Qld	T,S(l/m)	√	a b e	30 -100	3	2
River red gum	NSW	T,S(l/g)	√	a b	150	3	3
	Vic	T,S(l/g)	√	a b	100 -120	7	1
Native pine	NSW	T,S(m)	√	a b	150	3	3
	Qld	S(m/l)	√	a b e	25 - 50	2	2
	Vic	NL	NL	NL	NL	NL	NL
Northern dry sparse	Qld	S(m/l)	√	a b e	30 - 70	2	2

NL - not logged

⁽¹⁾ C - clear-felling (<15% canopy retention)

S - selective logging

l - light, 15 - 30% canopy retention

m - medium, 31 - 60%

h - heavy, >61%

g - group, <1ha cleared

T - thinning

⁽²⁾ √ - Habitat trees left - except where 100% clearfelling is prescribed.

⁽³⁾ a - natural seed stock

b - seed trees left

c - regeneration burn

d - mechanical disturbance

e - top disposal

f - direct planting

g - aerial/hand sowing

h - coppice

⁽⁴⁾ Rotation period in Qld (see text)

Source: National Forest Inventory (1997).

Table 47: The area of public forested land subject to management plans in June 1998, by State and Territory

State/Territory	Agency	Total area managed by agency/ agencies (ha) ⁽¹⁾	Area under plan at 30/6/94 (as % of total area managed)	Area expected to be under plans by 30/6/99 (as % of total area managed)	Approximate management plan review interval (years)
Australian Capital Territory	ACT Forests	18 300	0	100	ND
	ACT Parks & Conservation Service	134 000	70	100	10
New South Wales	State Forests	3 355 000	100	100	5-10 ⁽⁴⁾
	National Parks & Wildlife Service	4 189 600	3	25	12
Northern Territory	Parks & Wildlife Commission of the Northern Territory	ND	1	4	1
Queensland	Department of Primary Industries	4 305 900	11	100	6
	Department of Environment and Heritage	4 969 100	ND	ND	ND
South Australia	Department for Environment, Heritage and Aboriginal Affairs	11 260 300	ND	ND	ND
	ForestrySA	126 400	73	ND	5
Tasmania	Forestry Tasmania ⁽²⁾	1 600 000	100	100	1
	Environment and Land Management	2 546 000	59	63	1
Victoria	Department of Natural Resources and Environment	7 793 800	67	100	5
Western Australia	Department of Conservation and Land Management	2 472 300	99	99	10
Commonwealth ⁽²⁾	Biodiversity Group, Environment Australia	2 166 400	92	ND	8

ND - No data

⁽¹⁾ Note that the areas given in this column are tenure areas ie they include both forested and non-forested land managed by the respective agency.

Also the areas have been rounded to the nearest 100 ha.

⁽²⁾ Consists of land managed by ANCA viz: Jervis Bay NP, Kakadu NP, Norfolk Is NP and Christmas Is NP.

Does not include land managed by other agencies, such as Defence etc.

⁽³⁾ All areas are subject to review of 3 year production plan.

⁽⁴⁾ Revisions are temporarily suspended pending completion of Regional Forest Agreements

Source: National Forest Inventory (1997).

number of community services associated with public safety or health and community use of forests, sometimes funded by other agencies or by treasury. However, there is no national information about the value and cost of such services.

Management of conservation reserves

Conservation reserves such as national parks and flora reserves are generally subject to less human-induced disturbance than are multiple-use forests, although they remain prone to a number of impacts and disturbances.

Management goals are often based on the conservation of biological diversity, the maintenance of wilderness where recognised, and provisions for appropriate recreation uses.

Conservation management agencies

The summaries of key information at the end of this report show the agencies in each State or Territory with responsibility for forest management in conservation reserves, and their institutional evolution.

Calculating the costs of conservation management is a difficult task: data on the costs of operating conservation management agencies have been compiled for some agencies (Table 49), but they do not distinguish between forested and non-forested land.

Management plans

Management plans form the basis of management in many conservation reserves. Table 47 shows the area of public forest in each State or Territory covered by management plans in early 1998.

Community service obligations

Agencies with responsibility for the management of conservation reserves provide a number of community services associated with public safety or health and community use of forests, sometimes funded by other agencies or by treasury. However, there is no national information about the value and cost of such services.

Management of leasehold forests

In most leasehold forests, maintenance of the forest cover is not a prime objective of management. Nor, usually, is commercial timber extraction, although this does take place in some leasehold forests such as the cypress pine forests of Queensland and New South Wales.

Leasehold forests are affected by management decisions taken in the context of the main land uses, which are predominantly sheep and cattle grazing. Such grazing is normally practised as part of a package of activities including:

- introduction and husbanding of domestic livestock;
- selective harvesting of timber and some other non-timber products;
- manipulation of tree stocking to enhance pasture production;
- introduction of exotic pasture species; and
- manipulation of fire regimes to enhance production of food for domestic stock.

There is no centralised system for documenting forest management in leasehold forests.

Management of other crown land

The management of forested other crown land varies with the legal occupant, which may be one of the defence forces, an Aboriginal group, mining company, scientific or educational institution, or a gas, electricity or water utility. Some crown land is unallocated. There are no State, Territory or national overviews of management objectives nor national information on the extent of management plans on these lands.

Management of private forests

Management of native forests on private land is the responsibility of the owner, subject to Commonwealth, State, Territory and local government regulations. For example, some States restrict the clearing of forest on private land.

Table 48: Content of codes of forest practice, by State and Territory

	ACT 1995 ⁽¹⁾	NSW 1995	Qld 1995 ⁽¹⁾	SA 1995 ⁽¹⁾	Tas 1993	Vic 1996	WA 1996
Planning							
Care of soils		✓	✓	✓	✓	✓	✓
Water quality and flow	✓	✓	✓	✓	✓	✓	✓
Site productivity	✓	✓	✓	✓	✓		
Timber harvesting plans	✓	✓	✓	✓	✓	✓	✓
Building access to the forest	✓ ⁽²⁾						
Planning and siting roads	✓	✓	✓		✓	✓	✓
Road design and construction	✓	✓	✓		✓	✓	✓
Upgrading existing roads and tracks	✓	✓	✓		✓	✓	✓
Rock quarries and gravel pits	✓				✓	✓	✓
Bridge, causeway and ford construction	✓	✓	✓		✓	✓	✓
Road maintenance	✓	✓	✓		✓	✓	✓
Harvesting							
Design, planning and equipment	✓	✓	✓		✓	✓	✓
Wet weather	✓	✓	✓	✓	✓	✓	✓
Snig tracks and landings	✓ ⁽²⁾	✓	✓		✓	✓	✓
Water quality and stream protection	✓	✓	✓	✓	✓	✓	✓
Salvage operations	✓				✓	✓	
Steep country		✓	✓		✓	✓	✓
Conservation of other values							
Flora	✓	✓	✓	✓	✓	✓	✓
Fauna	✓	✓	✓	✓	✓	✓	✓
Rare or endangered species		✓	✓	✓	✓	✓	✓
Landscape	✓	✓	✓	✓	✓	✓	✓
Archaeology (cultural heritage)	✓	✓		✓	✓	✓	✓
Geomorphology				✓	✓		
Forest establishment							
Reforestation	✓	✓	✓	✓	✓	✓	✓
Maintaining forests							
Fire management	✓	✓		✓	✓	✓ ⁽²⁾	✓
Pest, disease, weed control	✓	✓	✓	✓	✓	✓	✓
Use of chemicals	✓ ⁽²⁾	✓	✓	✓	✓	✓	✓
Thinning	✓	✓ ⁽²⁾	✓	✓	✓	✓	✓

Notes: The Commonwealth and the NT have no multiple-use forests and therefore no code of forest practice. In the NT, the Parks and Wildlife Commission issues licences for individual harvesting operations, specifying the conditions under which harvesting may occur.

⁽¹⁾ Draft only.

⁽²⁾ Written into separate documents, for example, Code of practice for fire (Vic).

Source: National Forest Inventory (1997).

Table 49: Amount spent on conservation and forest management

State/ Territory	Agency	(\$'000)			
		1991/1992	1992/1993	1993/1994	1994/1995
<i>Australian Capital Territory</i>					
Forestry	ACT Forests	5 833	6 110	7 141	6 538
Conservation		N/A	N/A	N/A	N/A
<i>New South Wales</i>					
Forestry	State Forests NSW	N/A	95 951	94 316	108 531
Conservation		N/A	103 053	107 508	151 029
<i>Northern Territory</i>					
Forestry		N/A	N/A	N/A	N/A
Conservation	Parks and Wildlife Commission	33 713	34 550	36 104	35 370
<i>Queensland</i>					
Forestry	Department of Natural Resources	22 085	26 798	28 421	29 764
Conservation	Department of Environment	15 380	20 760	23 430	22 550
<i>South Australia</i>					
Forestry	Forestry South Australia	N/A	235	166	171
Conservation		N/A	N/A	N/A	14 000
<i>Tasmania</i>					
Forestry	Forestry Tasmania	50 928	47 304	51 960	66 269
Conservation	Tasmania Parks & Wildlife Service	N/A	20 280	20 424	22 297
<i>Victoria</i>					
Forestry	Department of Natural Resources and Environment	58 859	64 933	64 406	67 369
Conservation	Department of Natural Resources and Environment	24 286	28 133	25 658	30 925
<i>Western Australia</i>					
Forestry	Department of Conservation & Land Management	34 431	41 195	45 007	53 190
Conservation	Department of Conservation & Land Management	12 170	14 574	15 250	16 837
<i>Commonwealth</i>					
Forestry		N/A	14 788	8 718	7 316
Conservation		817	3 092	3 710	4 459
<i>Australia</i>					
Forestry		172 136	289 842	298 733	339 148
Conservation		86 366	224 442	232 084	297 467

N/A – Not applicable.

Source: National Forest Inventory (1997).

The management arrangements that apply to private forests are complex because of the diversity of objectives and ownership arrangements. Land may be owned or leased privately. The management responsibility for trees on such land may be linked to the land on which the trees grow, or it may be separate from it. These arrangements also differ between States and Territories.

Private owners may manage their own forests or may make arrangements such as sharefarming, whereby other private individuals, companies or public agencies may take on some or all management responsibilities for the forests. Private owners may also enter into covenants or voluntarily register part of their land for the protection of conservation values.

Management of private plantations also has a diversity of arrangements. Large private companies and a range of farm forest growers tend to be independent, whereas many growers with medium to small holdings utilise a variety of arrangements with regional committees, private consultants, or joint ventures with large companies or public agencies.

Some States have legislation which ensures formal links between the management of private forests for timber and the forest codes of practice in force in those States, as for example, in Tasmania and Victoria.

A national summary of the amounts of forests under each of these diverse arrangements is not available.

Broadly speaking, there are two kinds of private native forests: those in regions in which intensive timber harvesting is a major land use, making long-term management for timber production an economically viable option. The second kind occurs largely in the drier agricultural zones, where forests – and the land they occupy – are perceived mostly as a source of land for agriculture. There is no centralised system for documenting forest management in either kind of private forest.

Codes of forest practice in private forests

In Tasmania, the code of practice and the *Forest Practices Act 1985* cover private commercial forests in addition to public

forests. Victoria's code also covers commercial forestry on private land. In other States, private forest management is not required to adhere to codes of forest practice.

Management of cultural values

As knowledge about the range and significance of cultural values of forests improves, so do the management systems employed to maintain them. Recognition of the often interrelated nature of cultural and natural values of forest areas, such as the ecological and cultural values associated with old-growth forest areas, is leading to improvement in the integrated management of these values. The appropriateness of management techniques varies according to the particular cultural and natural values of a forest place, and may sometimes conflict. Legislative and non-legislative protective mechanisms provide for the formal recording and registering of places. Other management techniques include reservation, buffering from disturbance activities, maintenance and restoration. In many instances, however, the continued provision of access by communities to places that are culturally significant to them is the best way to ensure the maintenance of cultural values.

The cultural needs of traditional owners are increasingly being incorporated into management plans. Programs are operating which locate the sources of knowledge on traditional management of forested land and develop plans that utilise traditional practices to achieve environmental protection.

Pest and disease control

Responsibility for pest control activities rests with the forest owner or manager. Government agencies determine which pests and diseases must be controlled, and there are some pests and diseases that managers choose to control for their own purposes. Control of some native species may require permits from relevant State or Territory agencies.