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4.1 Forests as an ESD resource

4.1.1 Introduction

Forests are a major and critical part of the natural world and a basic component of many of the earth's ecosystems.

Forests, either native or plantation, have the potential of being a vital environmentally sustainable resource for human society by providing a wide range of benefits in three main areas:

- **Environmental**, including clean water, carbon sinks, and biodiversity and preservation of flora and fauna;
- **Community**, including cultural heritage, landscape, recreation; and
- **Economic**, including: generation of wealth, employment, timber and other forest products, tourism and animal products such as honey.

Forestry is the human management of forests. Sustainable forestry is about achieving a balance, and interaction, between these three areas. These benefits need to be available to future generations.

When considering timber as a suitable building material, the sustainability of forestry practices is critical. Almost all negative environmental effects of timber production are associated with its growth and harvest (Willis *et al* 1998).

It is important that the impact of forestry be considered in the broader context. The biggest threat to natural diversity in much of Australia is land clearing. This land clearing is not just due to forestry-related activities, but also to agriculture, dams, and residential or commercial development (World Wildlife Fund 2004). Urban expansion is a major issue.

Figure 4.1 shows the relationship between biodiversity and non-renewable input levels for different types of human activity. Of the impacts shown, native forest harvesting has the least impact on ecosystem sustainability.

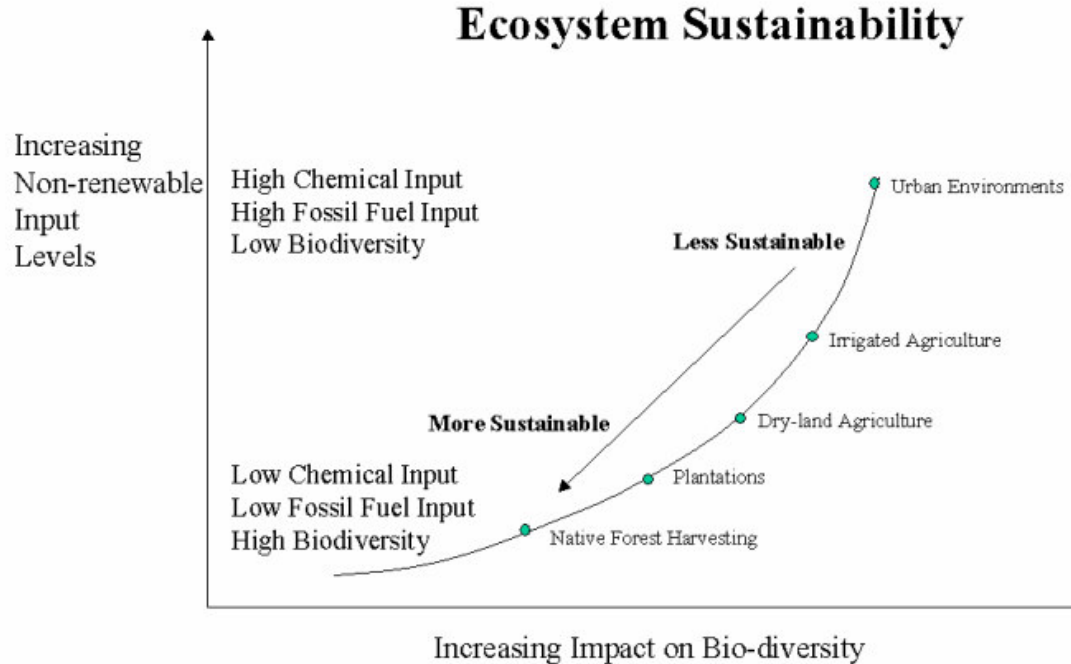


Figure 4.1 Human Impacts and Biodiversity. Source: Pers. Comm. P. Rutherford, Director Dept. Sustainability and Forest Management

The impacts related to the forestry industry, and the benefits of the industry are complex and it is not possible to thoroughly cover all of these in any one document.

4.1.2 Types of forests in Australia

Forests are dynamic assemblies of living organisms, plants and animal. While they may appear unchanging during the day to day phase of human life, they change, develop, or decline over years in response to the prevalent conditions. The major influences on forests are:

- Climate, soil, dominant species;
- The level of disturbance, either natural or human, and time; and
- Management regimes. With the increased reach of humans, all forests are also subject to differing management practices.

There is a major separation between native forest and plantations. Plantations are dealt with in a later section.

The major types of native forest are:

- Rainforests
- Wet Sclerophyll
- Dry Sclerophyll
- Mixed Forests

Rainforests

Rainforests grow in areas of high rainfall and do not require disturbance (eg. fire) to regenerate. In Australia there are both tropical rainforests in the north and temperate rainforests in the south (Figure 3.2).

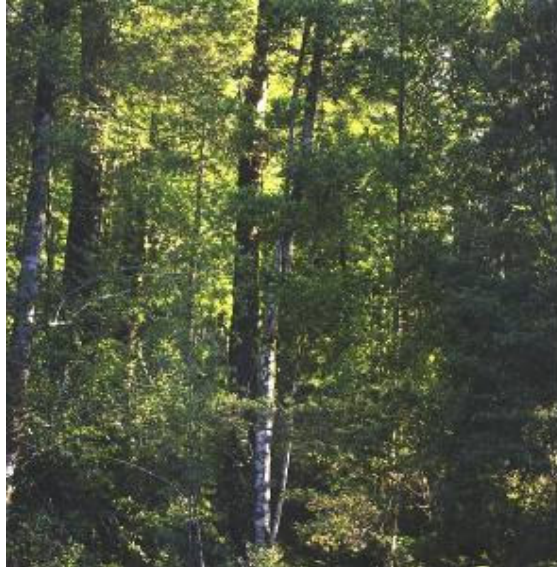


Figure 4.2: Rainforest

Wet sclerophyll

Wet sclerophyll forests are made up of plants with hard wax-covered leaves that are well adapted to limited water supply. They are characterised by large Eucalypts at canopy level and a dense understorey component (Figure 3.3). They are generally even-aged, a reflection of the occasional occurrence of fire events.



Figure 4.3: Wet sclerophyll forest

Dry sclerophyll

Dry sclerophyll forests are dominated by Eucalypt species and depend on regular disturbance to regenerate. They are less dense than wet sclerophyll forests and

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have a greater floristic diversity. These forests do not tend to be even aged as fires are generally more frequent and less intense than in wet sclerophyll forests (Figure 4.4).



Figure 4.4: Dry sclerophyll forest

Mixed forests

In mixed forests, the canopy consists of a mixture of rainforest and tall eucalypt species. They require occasional disturbance such as fire) to regenerate, but would not survive in a regime of frequent fire.

The forest cycle

Forests are dynamic, changing over time. The natural change is generally known as succession and this principal is shown in Figure 4.5.

Forests are influenced by natural disruptions such as wildfire and storms, or by human manipulation, such as harvesting, regeneration burns and direct planting. It is useful to categorise forests by the time since the last major disturbance and the level of direct human management, namely:

- Mature and old growth forests
- Regrowth forests
- Plantations

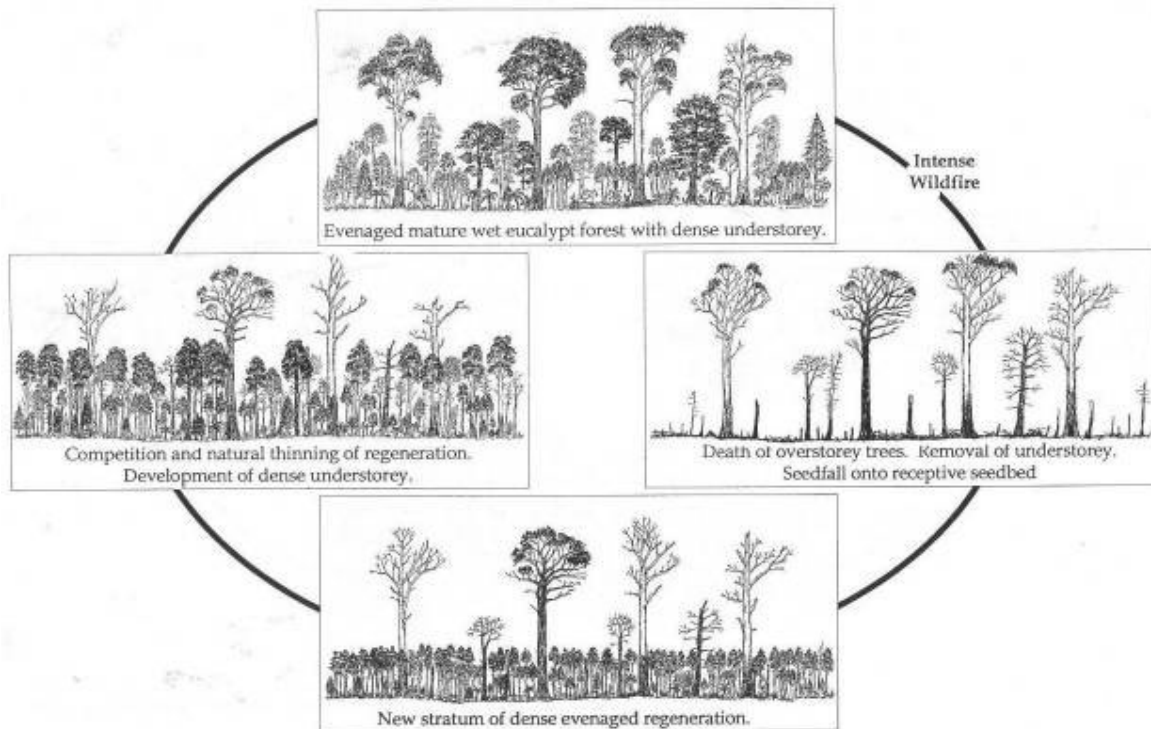


Figure 4.5: Successional stages for a wet Sclerophyll forest. Source: Forestry Tasmania (2002)

Mature and old growth forests

Old-growth forests are ecologically mature forests that have been subjected to negligible unnatural disturbance, such as harvesting, roading, clearing; or where the effects of any such disturbance is now negligible. The definition focuses on forest in which the upper stratum or overstorey is in the late mature or over mature growth phases (Department of Agriculture, Fisheries, and Forests, undated).

Mature forests will be ecologically mature but may have been subjected to significant disturbance. Therefore, old growth forests are by definition mature forests, but mature forests may not necessarily be old growth forests.

Regrowth forests

Regrowth is native forest containing a substantial proportion of trees in a younger growth phase, actively growing in height and diameter. Most native eucalypt forests result from a natural disruption such as a wildfire. Regrowth forests may contain scattered individuals or small occurrences of ecologically mature, or old-growth trees (Department of Agriculture, Fisheries, and Forests undated).

Management regimes

For management purposes, Australia, like many other countries, has three broad groups of forests:

- **Reserved forest**

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- **Multi-purpose native forest**, both mature and regrowth.
- **Plantations**, generally eucalypt or pine species.

Reserved forests

Reserved forests include world heritage areas, national parks, forest reserves and almost all wilderness. They are managed for environmental, community and a narrow range of economic benefits, such as restricted tourism.

Wilderness can be thought of as areas where the effects of human intervention are very low (but not zero (Willis *et al* 1998)). It provides little of what is currently classed as direct and immediate economic value when compared to a thinned pine plantation. It does, however, provide society with considerable environmental benefits through clean water, air and biodiversity, and spiritual benefit through its existence, wonder and beauty.

Many reserved areas are high conservation value forest and have high levels of biodiversity.

Multi-purpose native forest

Multiple use forests are managed for a variety of uses and values, such as water production, recreation, agriculture, and timber production (Department of Agriculture, Fisheries, and Forests, undated).

Although managed native forests have lower levels of biodiversity than undisturbed or wilderness areas, their biodiversity is higher than almost any other type of managed land use. Either a natural fire event or a regeneration burn in a harvest area will result in lost habitat. However, in a regeneration burn, the surrounding areas are largely unaffected and conservation and connection corridors are maintained. Wildlife and minor plant species generally repopulate the regenerated areas.

The less chemicals used, the less local impact there is, and the more time between impacts, the greater biodiversity will be.

Plantation forests

Plantations are intensively managed stands of trees of either native or exotic species, created by the regular placement of seedlings or seed (Department of Agriculture, Fisheries, and Forests undated) (Figure 4.6). They are either of introduced species or intensively managed stands of indigenous species, which meet the following criteria:

- one or two species at planting
- even age class
- regular spacing

The maintenance of a plantation can involve protecting the seedling from competition from other plants and browsing animals, and pruning and thinning the trees during their growth.



Figure 4.6: Plantation hardwood

Australia's plantations are either eucalypt species, radiata pine or some other indigenous species of pine. In 2003 there were about 0.98m hectares of softwood plantation in Australia. This was growing at 23,000 hectares per year. There were 0.68m hectares of hardwood plantation.

90% of the world's timber supply currently comes from native forests and about 10% from plantations. It will take 50 - 100 years before this ratio can be reversed. In the meantime, both native forest management and plantation forestry are being challenged to balance the need of timber production and ecological sustainability.

Plantation hardwood forests

Most trees planted in eucalypt plantations are genetically selected (but not engineered) for growth rate and disease resistance. Plantations are generally monocultures and over sixty percent of established plantations are *E. globulus*, Southern blue gum (De Fegely, 2001). Most of Australia's current hardwood plantations were planted for pulp.

Biodiversity in these plantations is considerably less than in native forests but is higher than in annual crops or pastures. Its absolute level varies with the management regime (Hobbs *et al* 2003). However, because plantations are a relatively long-term native species crop, significant habitat can be provided for some species. Soil losses to erosion and nutrient demands are generally lower than for annual crops or pasture, and water quality can be improved by plantations.

Some plantations are managed so that the rigid lines established in planting are deliberately broken down. These plantations have an open canopy, leafy understorey and a long rotation, and, to the untrained eye, can become indistinguishable in appearance from a regenerated native forest.

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Plantation pine forestry

Like eucalypt plantations, establishing pine plantations can involve protecting the seedling from competition from other plants and browsing animals, and pruning and thinning the trees during their growth. Softwoods are also genetically selected for growth and end products.

Because pine species have been used in plantations all over the world for a long time, there is much greater knowledge of their growth and use than is the case for eucalypts. Softwoods provide the full range of products, from fibre to wood chips and solid timber.

Biodiversity in pine plantations, which are generally exotic monocultures, is even less than native forests and hardwood plantations. Despite this, they can still provide clean water and air and places of beauty and recreation. Again, biodiversity remains higher than in annual crops or improved pastures.

4.1.3 Carbon sequestration

A forest acts as a sink for CO₂. An older forest will sequester lesser amounts of CO₂ than a younger and faster growing forest. See Module 3 for more detail.

4.1.4 Land rehabilitation and biodiversity

There can be significant environmental benefits from growing more trees, especially eucalypts in re-established native forests or plantations, specifically in:

- The rehabilitation of degraded agricultural land and
- The protection of biodiversity

Land rehabilitation

A recent audit of the Murray-Darling River basin (Australian Greenhouse Office and the Murray-Darling Basin Commission 2001) suggested that there are at least three compelling drivers for using commercial forestry and agroforestry to revegetate the mid to low rainfall zones of Australia. Deep-rooted woody perennial vegetation:

- Is central to recharge reduction strategies for managing salinity
- Is important in reducing the level of greenhouse gases in the atmosphere
- Provides a significant opportunity to develop new industries in rural Australia.

Where plantations are established on previously cleared agricultural land (as is very often the case), beneficial impacts may include the improvement of soil conditions through:

- The application of fertilisers
- Aeration of soils by tree roots
- Addition of organic matter by way of leaf litter
- Reduction of soil erosion and the rate of movement of eroded soil into waterways due to presence of tree roots and leaf litter and by way of the sheltering effect of the plantation.

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- Deep-rooted trees, rather than shallow-rooted crops, can act to lower water tables; and
- Trees can shade aquatic ecosystems from excessive heat and light which can contribute to algal blooms.

Plantations have been successful in ameliorating soil salinity caused by raised water tables (Salt *et al* 2004).

Wildlife and biodiversity

Biodiversity is important because human life depends on these resources and their interaction for its food, many of its medicines, industrial products and many of its cultural values.

As stated above, biodiversity benefits of plantation forestry include the ability to help combat salinity and erosion issues. There is considerable evidence to suggest that although plantations differ substantially from native forest, it is possible they can provide biodiversity benefits when appropriately managed (Salt *et al.* 2004).

Harvesting of forests has an inevitable impact on biodiversity. The impacts on biodiversity over broad forest areas are not clear cut and are largely dependant on forest practice.

4.1.5. Employment

In 2001, 78,500 people were directly employed in the forest industry across Australia. They worked:

- *In the forest* planning and controlling forest operations, harvesting trees, regenerating harvested areas, and establishing new forests and managing existing ones. Much of the employment is rural and is an essential part of many small rural communities.
- *In forest management* where forest planners make use of up-to-date expert information on flora and fauna, place special emphasis on rare and endangered species, genetic resources, water quality and flow, cultural heritage, visual amenity and landscape, soils, and geological features such as caves. The involvement of experts greatly improves the quality of forest managers' decisions.
- *In saw and veneer mills* Sawyers, graders and sorters produce veneer and solid timber products in both hardwood and pine. There were 1,141 sawmills Australia-wide in 1999-2000.
- *In pulp, paper and board mills* producing quality papers and newsprint

(Australian Bureau of Agricultural and Resource Economics 2003)

The gross value of forest production in 2001-02 was \$1,344 million (Australian Bureau of Agricultural and Resource Economics 2003).

Employment in the forest industries is very important in rural and regional communities (Figure 4.7).



Figure 4.7: Employment in the forest industries

4.2. Forest Management

4.2.1 Importance of sustainable forest management

The aim of sustainable forest management practices is to ensure the various aspects of forests that are valued by the community are available for future generations. If the total forest area stays the same, any increased allocation in one benefit is likely to affect the enjoyment of the others. However, any increase in the total area of forest can provide additional benefits in many areas.

Consequences of unsustainable management

Unsustainable forest management, such as overharvesting and excessive land clearing, can lead to impacts such as:

- Impacts on soils (snigging tracks, soil compaction, clear felling and site burning and changes in nutrient levels).
- Salination. Note however, planting forests can play a positive role in the amelioration of salinity.
- Water pollution (sediment from road building and harvesting operations, fuels, chemicals such as weedicides, fertilisers and pesticides used in the establishment phase, rising water tables due to permanent tree removal). In general, forests affect the quality, but not the quantity of water.
- Significant decreases in biodiversity
- Undesirable changes in ecosystems

The extent and effect of these impacts is heavily dependent on management practices and they are generally regulated by forest practices codes. With regard to unsustainable forest management, the following points should also be noted:

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- The Resource Assessment Commission (RAC 1992) stated that agricultural expansion and grazing were the main threats to endangered forest and woodland species. About 5% of endangered species and vulnerable plant species may be affected by timber harvesting, and an additional 30% of these species could be indirectly affected.
- No evidence was found to suggest that the risks of extinction due to logging presented an immediate threat to the ecological processes on which forest systems depend (RAC 1992).
- Other land uses such as agriculture and urban expansion can have more significant impacts on parts of an ecosystem than forestry.

4.2.2 Australia's forest management

Societies in developed countries such as Australia, are increasingly committed the supply of timber from sustainably managed forests.

Competing benefits of forests have now resulted in complex system planning and management. In very general terms, the area available for timber harvesting has decreased over the past 200 years and the amount of timber in reserves has increased. This process of reservation has accelerated over the past 20 years.

Essentially, management processes are divided amongst three overlapping 'jurisdictions'. These all need to be considered in terms of ESD:

- Local action – planning, harvesting, regeneration
- Regional planning
- National planning

Local action

Planning a harvest

Modern practices in multi-purpose native forests are complex, especially in state forests. As part of forest planning for the three areas of societal benefit, the following issues need to be addressed:

- Mapping of wildlife and plant populations in forest areas and establishment of reserves for vertebrate & invertebrate wildlife and plant conservation, habitat corridors, and streamside and water quality protection.
- Tourism
- The accommodation of other non-timber economic activities such as beekeeping

The following steps are then taken:

- The remaining harvestable areas, or coupes, are then identified.
- Growth and product volumes are estimated and areas scheduled for harvesting in the future. These growth estimates provide the basis for estimating sustainable timber production. Because the forest estate is managed for product supply over time, only a small percentage is harvested in any one year.

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Good forest management practices can benefit the environment by reducing the loss of timber and by creating wildlife habitat.

Harvesting

In addition to the impacts of log extraction, timber harvesting usually includes activities such as building access roads and establishing plantations or native forest regeneration.

Selective logging and clear felling are two common ways of harvesting timber (Figure 4.8). The method used will depend on the regeneration desired and the forest type, for example, in Tasmania, dry forests are generally selectively logged (Forestry Tasmania 2002).



Figure 4.8: harvesting operations

Any harvesting activity will require a prepared plan consistent with a Code of Practice. In any plan, features such as streamside reserves, special heritage or protected natural features must be considered.

After harvesting logs must be transported to the relevant processing plants. Much transport is currently by road, but in cases of long distances sometimes rail may be used (see Section 3.2).

Regeneration

The method of regeneration required will determine the harvesting method. Fire is one of the most common management tools used in regeneration after harvesting. It is used to promote new growth in Eucalypt plantations by allowing increased solar radiation to reach the seedlings and to provide better germination conditions. These burns are carefully planned and controlled and their intensity will depend on forest type.

In many areas of Australia, regeneration seed is collected from the harvesting area prior to harvest and then sown after the burn. The mix of the sowing seed is important and aims to allow each regenerating eucalypt species to be maintained in the same proportion as it previously was in the harvested stand (Forestry Tasmania 2002). This also maintains the environmental profile of other life in these areas.

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In some dry forests mechanical means may also be used to prepare the ground and some supplementary sowing of seed is done.

Regional Planning for Forests in Australia

Through a series of formal scientific, social, economic, cultural and heritage evaluations, Australian State and Commonwealth governments established ten regional forest agreements. These agreements were formally executed between 1997 and 2000 and each has a twenty-year term. They provide Australia with a world class forest reserve system for timber industries and regional communities as well as ecologically sustainable management of the whole forest estate, both on and off reserves.

Regional Forest Agreements (RFAs) aim to establish:

- A world class comprehensive, adequate and representative forest reserve (CAR) system based on nationally agreed criteria;
- An innovative, internationally competitive wood and wood products industry; and
- Ecologically sustainable management of the whole forest estate, both on and off reserves

Acceptance of the effects of past unsustainable practices and political pressure forced the reduction in multi-use areas that were formalised through the RFA process. While still the target of vigorous political debate, the RFAs have all incorporated several key aspects fundamental to sustainable practice:

- Each involved an extensive plant and wildlife survey
- Each required a minimum reservation of 15% of the pre 1750 distribution of forest ecosystems
- Each established a process for determining a demonstrably sustainable level of forest production.
- Codes of Forest Practice are required

To maintain an adequate but sustainable level of product supply from the unreserved native forests, considerable effort has gone into intensively managing the remaining native estate. This has meant thinning forests to increase saw log productivity and clearing poorly regrown areas and regenerating them. Because the forest modelling underpinning forest growth and productivity estimates are continually being refined, the level of product supply held to be sustainable is regularly revised.

The RFA process is not perfect. Growth modelling needs further development and the regime of strictly defined boundaries between reserves and production areas currently fails to recognise forests change and significant natural disruptions occur. Today's old growth eucalypt forest may be a myrtle forest in 100 years. Walshe (2002) believes forest areas should be cycled in and out of reserve areas to ensure forest diversity, conservation and production outcomes over time. However, given the nature of forests debate such a proposal is unlikely to be politically acceptable.

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Most of the mandatory requirements have been developed by State Governments which have the primary responsibility for the health of forests. Codes of Forest (Management) Practice are either in force or in the process of being implemented in all States of Australia with native forest and plantation responsibilities.

Australia's National Forest Policy Statement

The Commonwealth, State and Territory governments agreed to share a vision of ecologically sustainable management of the forest estate that integrates environmental, commercial and community values and uses. These were then embodied in the National Forest Policy 1992.

The Policy sets out broad conservation and industry goals for the management of Australia's forests. These goals relate to:

- Conservation
- Wood production and industry development
- Integrated 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
- International responsibilities

To implement the national policy, governments agreed to:

- Provide interim protection to forest areas that may be required for a Comprehensive, Adequate and Representative (CAR) forest reserve system
- Undertake Comprehensive Regional Assessments (CRAs) of environment, heritage, economic and social values of forests
- Negotiate 20-year Regional Forest Agreements (RFAs) between the Commonwealth and State Governments to formalise long term management and use of forests in a particular region

Comprehensive, Adequate and Representative Forest Reserve System

The establishment of a national reserve system to safeguard biodiversity, old growth, wilderness and other natural and cultural values of forests was specified by the National Forest Policy. The national reserve system is known as the Comprehensive Adequate Representative Reserve (CAR) system. Forests outside the reserves are available as multiple use forests for wood production, subject to codes of practice to ensure long-term sustainability and contribution to the conservation of natural and cultural values.

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The system is based on national criteria developed to implement the RFA process. The CAR reserve system is based on three guiding principles. It must be:

- Comprehensive: including the full range of forest communities.
- Adequate: ensuring the reserved areas are of sufficient size to maintain the ecological viability and integrity of populations, species and communities.
- Representative: those sample areas of the forest that are selected for inclusion in the reserves should reasonably reflect the biotic diversity of the communities.

The following levels of reservation are required by the national criteria:

- 15% of the distribution of each forest ecosystem that existed prior to Europeans arriving in Australia (pre 1750);
- 60% or more of the current distribution of old growth forest;
- 60% or more of the current distribution of forest ecosystems, if rare or depleted;
- all remaining occurrences of forest ecosystems or old growth that are rare or endangered; and
- 90% or more of high quality wilderness.

State/ Territory	Formal	Informal	Pending	Total Reserve	% of all forests
ACT	106			106	A
NSW	4,471	450		4,921	23%
NT	12			12	0%
QLD	5,000	9	37	5,009	10%
SA	3,943	n/a		3,943	72%
TAS	1,097	174		1,271	40%
VIC	3,050	503		3,553	49%
WA	3,805	n/a		3,805	11%
Australia	21,484	1,137		22,620	15%

Table 4.1: Areas ('000 ha) of native forest in formal, informal and pending reserves. Adapted from Department of Fisheries Forests and Agriculture 2003.

4.3 Forest certification

4.3.1 Certification and its basis

Timber as a building material has been recognised for environmental qualities such as low embodied energy and provides a store for carbon. However, because timber is sourced from forests that provide other benefits to society, forest management and timber harvesting have become key considerations in the determination of the environmental credentials of timber.

Certification of forests and forest products grew out of the desire to reduce the uncontrolled cutting of the world's tropical hardwood forests by being able to distinguish between timber sourced from sustainably managed forests from timber that is not. This objective has been expanded into an overall goal to ensure forests throughout the world are sustainably managed. Certification schemes have developed in size and complexity over the last decades (Timber Research Unit, University of Tasmania, undated). In general, this certification of building materials and components is driven by the both demand and supply sides of the market. The development of the Forest Stewardship Council in 1993 was based on a belief that working with market forces could be more effective than boycotts and bans on unsustainably produced timber.

Many countries or groups of countries are establishing forest certification schemes designed to suit national conditions but are also internationally recognised.

Currently, environmental certification for timber is only available for sustainable forest management practices. If timber users exercise a market preference for certified material, there is a commercial incentive for landowners to adopt sustainable forestry practices. This in turn, would result in greater market demand for environmentally certified timber, encourage wider adoption of sustainable forest management and discourage illegal and unsustainable practices.

Forest certification standards address forest management activities from the planning stage to how the activity is conducted. They also ensure the results of activities are monitored and reported. (Timber Research Unit, University of Tasmania, undated). Certification is not viewed as simply a biological issue and must include criteria for:

- Environmental issues; (water, biodiversity, endangered species, store for CO₂).
- Social and cultural considerations; (landscape, multiple use, traditional, community and recreational values).
- Economic benefits (employment, sustainable supply of timber for society's needs, and generation of wealth).

As a minimum, forest certification for timber includes:

- Certification that management of particular forests complies with documented and agreed environmental standards.

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- A documented chain of custody exists for the products drawn from those forests, through the production process to the customer.
- Controlled labelling of these products.
- Independent third party auditing that the standards of forest management and the chain of custody are being maintained.

Certification or assessment of the extraction of other building materials is rare, even though many have significant environmental impacts.

The process of timber certification

The process can be summarised as consisting of:

- Participation of: indigenous groups, industry, scientists, the community, and environmental groups. Certification must also take into consideration international agreements and commitments, national and state legislation, regional considerations (such as ecosystem considerations) and codes of forest practice.
- An accredited and independent third party auditor assesses the forest management according to performance criteria for sustainable wood production.
- Regular monitoring of forest management by an independent auditor.
- Labelling of timber products so they can be traced through the production sequence to the customer (chain of custody).

Other processes are required to assess the quality of the products or their fitness for purpose.

The benefits of forest certification include:

- Adding value to products by providing information about procurement.
- Specification (by many schemes) of performance standards for areas where no legal requirements currently exist.
- Verification regulatory requirements have been observed.
- Encouraging sustainable forest management.
- Providing a holistic approach to sustainable forest management.
- Third party auditing which provides an impartial external view.
- Possible delivery of other local or national benefits.

Notwithstanding these apparent benefits, there are some concerns regarding forest certification including;

- Participation in forest certification schemes adds costs.
- Comparable information is not available for alternative building materials.
- There may be implications for trade in relation to competitiveness and access to markets.

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- Principles underpinning the various certification schemes are not standardised and the process for their development and implementation are subject to debate.

Many Australian forest managers are ISO 14001 certified which means they have adopted a management system seeking to minimise environmental harm and to continually improve their environmental performance.

4.3.2 Certification internationally

All internationally recognised forest certification schemes embrace sustainable forest management, but there are differences that range from the definition of key terms to the approach that underpins the certification process.

The two dominant international certification schemes are the Pan European Forest Certification Scheme (PEFC) and the Forest Stewardship Council. Other smaller schemes operate across parts of America.

Many national certification schemes take standard internationally recognised assessment criteria into account to facilitate mutual recognition of schemes between countries.

In early 2002, about 150 countries were engaged in one or more international processes to develop the national criteria and indicators for sustainable forest management that would underpin forest certification. Most certification schemes and certified forest are found in industrialised countries, where forestry practices are already well regarded.

Some general concerns about environmental certification on the international scale include:

- Many developing countries have not yet begun to develop certification schemes because certification is mainly perceived as yet another difficult market requirement imposed by importers.
- Differences between forest certification schemes regarding the roles of
- Some inconsistency between standards.
- Issues with mutual recognition of certification schemes of different countries.
- Eco-labelling requirements and practices may discriminate between trading partners or between domestically produced goods or services and imports.
- There are no definitive legal interpretations concerning trade restrictions on the basis of environmental concerns or clear guidelines for international trade specifically relating to certified timber.

4.3.3 Certification in Australia

There are two certification schemes operating in Australia: the Australian Forestry Standard (AFS) Certification which is accredited under the PEFC process, and the Forest Stewardship Council. Both these schemes are voluntary and chain of custody is yet to be established for either of them.

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The development of AFS recognised unique aspects of the Australian environment and key international certification criteria. Prior to 2003, there were no third party forest certification schemes operating in Australia. It is a voluntary scheme and is applicable to native forest or plantation forest on public or private land.

The Standard has adopted the National Forest Policy definition of sustainable forest management relating to commercial and non-commercial forest values that will improve societal welfare and maintain benefits for future generations.

The forest management performance requirements of the Standard are derived from the requirements of similar international initiatives such as the Forest Stewardship Council and the Pan European Forest Certification scheme, and elements of the ISO environmental management standard. The nine criteria for forest management are:

- That it be undertaken in a systematic manner that addresses the range of forest values.
- That it provide for public participation and foster on-going relationships to be a good neighbour.
- That it will protect and maintain the biological diversity of forests, including their successional stages, across the regional landscape.
- It will maintain the productive capacity of forests.
- It will maintain forest ecosystem health and vitality.
- It will protect soil and water resources.
- It will maintain forests' contribution to carbon cycles.
- It will protect and maintain, for Indigenous and non-Indigenous people, their natural, cultural, social, religious and spiritual heritage values.
- That it maintain and enhance long-term social and economic benefits.

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