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Foreword

This report has been prepared by the Tasmania–Commonwealth Joint Steering Committee to facilitate stakeholder and wider community involvement in the development of a regional forest agreement for Tasmania. It builds on information contained in the Tasmania–Commonwealth Regional Forest Agreement background reports released between September 1996 and February 1997 and the results of extensive consultation.



The report outlines the current situation in relation to Tasmania's forests and forest-based industries and puts forward a number of approaches to important issues associated with developing the Regional Forest Agreement. The approaches build on the current situation and the existing policy framework to achieve a balanced outcome that best meets the range of RFA objectives agreed by to the Steering Committee.

The Regional Forest Agreement, scheduled for finalisation on 30 June 1997, will operate for 20 years and will be signed by the Prime Minister and the Premier of Tasmania. It will define the commitments made by Tasmania and the Commonwealth in relation to forest conservation, forest use and development and the development of industries based on the resources of Tasmania's forests. Its performance against these commitments will be reviewed every five years.

The release of this report marks the beginning of a six-week period of public consultation. Those presenting written submissions are invited to discuss the following:

- the issues and approaches outlined in the report and their implications;
- any matters of substance that have not been considered;
- other issues associated with the information presented.

The submissions will be taken into account when the Regional Forest Agreement is being prepared.



Acknowledgments

The Tasmania–Commonwealth Joint Steering Committee thanks all those who have helped in the preparation of this report, particularly Ms Debbie Phillips for her work in managing the compilation and production process and Ms Chris Pirie for her editing.

The Steering Committee has been supported by the Environment and Heritage and Social and Economic Technical Committees and by officers of various Tasmanian and Commonwealth government departments—without the efforts of these people, finalisation of this report would not have been possible. In particular, the contributions of all those who have worked at the RFA site in Hobart has been invaluable.

The Steering Committee is also grateful for the valuable contribution of those stakeholders who participated in the consultation process and for the continuing support of the Public Land Use Commissioner, Mr Bruce Leaver. The Steering Committee also acknowledges the efforts of the Public Land Use Commission mentors, whose work with stakeholder groups has been particularly useful. Preparation of this report has presented some unique and complex challenges. The Steering Committee greatly appreciates the commitment, enthusiasm and professionalism of everyone involved.

1 Introduction

During 1996 Tasmanian and Commonwealth government agencies conducted a comprehensive assessment of the full range of values in Tasmania’s forest estate. The information collected has been systematically compiled and analysed, to identify a range of approaches that take into account important strategic considerations and will assist in the formulation of the Tasmania–Commonwealth Regional Forest Agreement. This report has been prepared by the Tasmania–Commonwealth Joint Steering Committee.¹

1.1 The purpose of this report

This report summarises the current situation in Tasmania; as revealed by the comprehensive regional assessment, and provides a basis for public comment on specific matters and the range of strategic approaches to taking those issues into account. It is thus a critical part of the RFA process. The report should not be seen as predetermining the outcome of the RFA process: the approaches put forward will be refined to reflect public opinion and to incorporate further developments in information availability and analysis. The Commonwealth and Tasmanian Governments have not formally considered or expressed a preference for any of the approaches.

¹ Members of the Steering Committee are listed in Appendix A of the Summary Report to PLUC Background Report Parts C, D and E (1996g).

1.2 How can you respond?

The Tasmania–Commonwealth Joint Steering Committee is releasing this report for a six-week period of public comment. Further opportunities for discussion between the Joint Steering Committee and interested parties will be provided during this six-week period. If you wish to comment on any of the matters raised or approaches canvassed you can do so by writing to:

the Tasmania–Commonwealth Joint Steering Committee
c/- Public Land Use Commission
GPO Box 2036
HOBART TAS 7001

You can also contact the Commission on 03 6233 3769 (phone) or 03 6224 0825 (fax) or by e-mail on plc@delm.tas.gov.au.

1.3 The structure of the report

The report is divided into seven chapters. This first chapter briefly outlines the purpose of and background to the Regional Forest Agreement and details the arrangements for public consultation on the issues raised and approaches put forward in this report.

Chapter 2 discusses the principles and objectives of the Regional Forest Agreement, which have been used by the Joint Steering Committee to help identify issues and approaches, and the framework within which these principles and objectives have been applied.

Chapter 3 summarises information assembled during the comprehensive regional assessment in order to describe the current situation in Tasmania in terms of the extent to which levels of protection and resource supply contribute to the RFA principles and objectives. The description of the current situation is based on the RFA objectives.

Chapter 4 discusses the main strategic issues connected with the Regional Forest Agreement: these pose the greatest challenge for devising innovative and flexible ways of best meeting all the RFA objectives. Again, discussion in this chapter is based on the RFA objectives.

Chapter 5 presents a range of approaches to dealing with the considerations discussed in Chapter 4 and analyses them so as to show how a particular approach might affect the Regional Forest Agreement's capacity to achieve a particular objective or set of objectives.

Chapter 6 discusses a number of matters connected with the durability of the Tasmania–Commonwealth Regional Forest Agreement, among them Commonwealth statutory obligations relating to the National Estate, the World Heritage Convention and environmental impacts, Tasmania's statutory obligations, the provision of certainty for RFA outcomes, and conservation of values on private land.

Chapter 7 presents the Steering Committee's preliminary conclusions on the approaches outlined in this report.

1.4 The Tasmania–Commonwealth Regional Forest Agreement

Regional forest agreements are intergovernmental agreements that recognise the various social, economic, environmental and heritage obligations of both tiers of government in relation to the long-term management and protection of all forest values. The agreements will establish a sustainable resource base for industry and a more secure climate for investment. At the same time they will ensure appropriate protection of Australia's biodiversity, old-growth, cultural heritage and wilderness values through establishing a comprehensive, adequate and representative reserve system and complementary off-reserve management that aims to meet national criteria.

The Regional Forest Agreement will apply to all public and private forested land in Tasmania. It is to be completed by 30 June 1997 and is intended to operate for 20 years. One of the aims of the Agreement is to remove the Commonwealth from day-to-day involvement in decisions relating to the management of Tasmania's forests.

1.5 The background to the regional forest agreement process

The National Forest Policy Statement, developed in 1992 and agreed to by the Commonwealth and State and Territory governments, established three broad goals for the native forest estate:

- to maintain an extensive and permanent native forest estate in Australia;
- to manage that estate in an ecologically sustainable manner so as to conserve the suite of values that forests can provide for future generations;
- to develop internationally competitive and ecologically sustainable forest-based industries that maximise value-adding opportunities and efficient use of resources.

The Statement also outlined a national basis for satisfying the long-term requirements of conservation and industry. A vital element of the Statement was that joint Commonwealth–State comprehensive regional assessments of the environmental, heritage, social and economic values of Australia’s forests would be undertaken. These assessments would form the basis for negotiation of regional forest agreements between the Commonwealth and individual State or Territory governments.

Governments subsequently agreed to a three-step process for developing regional forest agreements. In relation to Tasmania, governments agreed to consider the State as one region. In the first step, immediate interim protection was given to all forest areas which at that stage were considered as potentially being required for conservation in reserves, while providing for the continuation of wood supply through the three-year Timber-Harvesting Plan. This Tasmanian Interim Forest Agreement was signed by the Tasmanian and Commonwealth Governments on 16 January 1996.

A Scoping Agreement was signed at the same time, committing both Governments to establishing procedures and processes for developing a regional forest agreement and a timetable for its completion. The Scoping Agreement contained a number of principles and objectives for the Tasmania–Commonwealth Regional Forest Agreement; these are discussed in Chapter 2.

In the second step, Commonwealth and Tasmanian government agencies, in collaboration with experts, embarked on a series of detailed studies of Tasmania’s forests, to determine their environmental, heritage, social and economic values. This information provides the necessary basis for analysis and identification of issues and possible approaches for a regional forest agreement. These studies were supplemented by an independent scientific review of ecologically sustainable forest management in Tasmania and by the Public Land Use Commission inquiry into mechanisms for conservation management on private forested land.

The results of these and other relevant studies were published by the Public Land Use Commission as a series of background reports:

- a report dealing with current Tasmanian and Commonwealth forest policy and legislation—Background Report Part A, published in July 1996;
- a report discussing the unresolved Recommended Areas for Protection—Background Report Part B, published in September 1996;
- the environment and heritage report—Background Report Part C, published in November 1996;
- the social and economic report—Background Report Part D, published in November 1996;



- the preliminary report of the Expert Advisory Group on Ecologically Sustainable Forest Management—Background Report Part E, published in November 1996;
- a discussion paper on mechanisms for achieving conservation management on private forested land—Background Report Part F, published in November 1996;
- the final report of the Expert Advisory Group on Ecologically Sustainable Forest Management—Background Report Part G, published in February 1997;
- the National Estate report—Background Report Part H, published in February 1997;
- the Margules Groome Pöyry report on Tasmanian forest-industry growth potential, published in March 1997;
- the report on tenure classifications for unresolved recommended areas for protection—Proposed Recommendations Report Part I, published in March 1997;
- the consultation report on mechanisms for achieving conservation management on private forested land—Proposed Recommendations Report Part II, published in April 1997;
- a report on processes and guidelines for determining the conservation requirements for priority flora and fauna species—to be published in April 1997.

The third step in the process involves integration of the information and the development of forest-use approaches to be subsequently agreed by both Governments in the Tasmania–Commonwealth Regional Forest Agreement. This report presents the results of that third step.

1.6 Consultative arrangements

The RFA process has provided the opportunity for widespread community involvement in all aspects of the work. The Tasmanian and Commonwealth Governments made use of the Public Land Use Commission’s inquiry process to facilitate public consultation and discussion. By systematically inviting public comment on the range of projects and background reports generated as part of the RFA process, and by organising discussions and workshops on specific subjects, the Commission has been very valuable in ensuring that the Steering Committee and the two Technical Committees² are fully aware of the opinions and concerns of interested parties. Appendix A summarises the public consultation opportunities provided to date through the Public Land Use Commission’s inquiry process.

² Members of the two Technical Committees are listed in Appendix A of the Summary Report to PLUC Background Report Parts C, D and E (1996g).



In addition to this facilitating role, the Commission was formally asked by the Tasmanian Government to conduct an inquiry into particular aspects of the RFA process. Details of this reference are provided in the Public Land Use Commission's Information Sheet no. 2.

1.7 Public involvement in integration

Interested parties were invited to formally comment on the information contained in Background Reports Parts A–H. Further, in September 1996 people and groups interested in the management of Tasmania's forests were invited to participate in the integration process (see the Public Land Use Commission's Information Sheet no. 9).

Through the Public Land Use Commission, a number of mentors were appointed to provide a conduit between the Steering Committee and the 18 groups or individuals who responded to the September invitation. These people and groups were invited to make further submissions outlining the matters and options they thought warranted consideration in the preparation of the RFA options.

Appendix B lists the submissions received and Appendix C summarises the matters raised in the submissions. Where possible, the matters raised are discussed in Chapter 4.

2 Principles and objectives

2.1 Principles

The Scoping Agreement signed by the Tasmanian and Commonwealth Governments on 16 January 1996 commits Tasmania and the Commonwealth to negotiate a regional forest agreement that is consistent with a range of policies, legislative requirements and agreements, among them the following:

- at the national level—the National Forest Policy Statement, the national criteria for a comprehensive, adequate and representative forest reserve system developed by JANIS (see Box 2.1), the goal, core objectives and guiding principles of the National Strategy for Ecologically Sustainable Development (see Appendix D), and the Intergovernmental Agreement on the Environment;
- at the Commonwealth level—the requirements of the *Environment Protection (Impact of Proposals) Act 1974*, the *Australian Heritage Commission Act 1975*, the *Endangered Species Protection Act 1992* and the *World Heritage Properties Conservation Act 1983*;
- at the State level—the commitments made under the 1990 Forests and Forest Industry Strategy (see Box 2.2) and legislative requirements such as those in the *Forestry Act 1920*, the *Forest Practices Act 1985*, the *Private Forests Act 1994*, the *Threatened Species Protection Act 1995*, the *National Parks and Wildlife Act 1970*, the *Environmental Management and Pollution Control Act 1994*, the *Mineral Resources Development Act 1995*, the *Mining (Strategic Prospectivity Zones) Act 1993*, the *Land Use Planning Approvals Act 1993* and the *State Policies and Projects Act 1993*.

In meeting the requirements of these policies, agreements and Acts, the Commonwealth agreed to the following:

- to acknowledge the principles of the Tasmanian Forests and Forest Industry Strategy—including the statutory requirement for Forestry Tasmania to make available a minimum aggregate annual quantity (300 000 cubic metres or another prescribed quantity) of eucalypt veneer logs and sawlogs, according to agreed specifications—where they are consistent with the National Forest Policy Statement (clause 2.2 of the Scoping Agreement);

Box 2.1 The JANIS reserve criteria

The JANIS reserve criteria are nationally agreed criteria for the establishment of a comprehensive, adequate and representative reserve system for forests in Australia. The criteria were developed by the Joint ANZECC–MCFFA National Forest Policy Statement Implementation Subcommittee (JANIS).

Regional conservation strategies

Conservation objectives will be best achieved through the development of integrated regional conservation strategies that provide for the establishment and effective management of conservation reserves (the CAR reserve system) and complementary management of adjoining forest areas.

IBRA

The Interim Bioregionalisation of Australia should be used as a basis for nature conservation planning, especially to comply with the principles of representativeness.

Components of the comprehensive, adequate and representative reserve system

All reasonable efforts should be made to provide for biodiversity, old-growth and wilderness conservation in the dedicated reserve system on public land. The components of the CAR system are dedicated reserves, informal reserves, and values protected by prescription on public land as well as conservation arrangements on private land.

Biodiversity

1. As a general criterion, 15 per cent of the pre-1750 distribution of each forest ecosystem should be protected in the CAR reserve system, with flexibility applied according to regional circumstances and recognising that as far as possible and practicable the proportion of dedicated reserves should be maximised.
2. Where forest systems are recognised as vulnerable, at least 60 per cent of their remaining extent should be reserved.
3. All remaining occurrences of rare and endangered forest ecosystems should be reserved or protected by other means, as far as is practicable.
4. Reserved areas should be replicated across the geographic range of the forest ecosystem.
5. The reserve system should seek to maximise the area of high-quality habitat for all known elements of biodiversity wherever practicable.
6. Reserves should be large enough to sustain the viability, quality and integrity of populations.
7. To ensure representativeness, the reserve system should, as far as possible, sample the full range of biological variation within each forest ecosystem.
8. In fragmented landscapes, remnants that contribute to sampling the full range of biodiversity are vital parts of a forest reserve system.

Old-growth forest

It is necessary to approach old growth in a flexible manner according to regional circumstances. Wherever possible, areas of old growth requiring protection should be included in the area identified to meet biodiversity criteria.

1. Where old-growth forest is rare or depleted (generally less than 10 per cent of the extant distribution) within a forest ecosystem, all viable examples should be protected, wherever possible.
2. For other forest ecosystems, 60 per cent of the old-growth forest identified at the time of assessment should be protected, consistent with a flexible approach, where appropriate increasing to the levels of protection necessary to achieve objectives for conservation and specific community needs for recreation and tourism.

Wilderness

Ninety per cent, or more if practicable, of the area of high-quality wilderness that meets minimum area requirements should be protected in reserves.

Application of the criteria

Flexibility in the application of reserve criteria is needed because of differing regional circumstances. The

criteria are considered to be guidelines rather than mandatory targets. In some circumstances and for some criteria, lower levels of reservation may prove adequate. The extent of potential social and economic impact may limit the ability to meet reserve criteria (see Sections 5.2, 5.4 and 6.1.1 of the JANIS document). Where different configurations of reserves are identified as meeting the criteria, the option that imposes the least cost on the community should be adopted.

- to apply to each State the same standards for forest management and environmental, heritage, social and economic goals, while allowing for regional variation between States, such as different forest types and differences in the level of information available (clauses 1(d) and 1(e) of the Scoping Agreement);
- to facilitate implementation of RFA outcomes through its Wood and Paper Industry Strategy and, where necessary, the Structural Adjustment Package (clause 16 of the Scoping Agreement) and to provide assistance for conservation outcomes from the Regional Forest Agreement, as specified in clause 14 of the Scoping Agreement.

In addition, both the Tasmanian and Commonwealth Governments agreed to the following:

- to work through the JANIS process towards national criteria for a comprehensive, adequate and representative forest reserve system (clause 12 of the Scoping Agreement);
- to consider jointly the conservation arrangements applicable to reserves and to production areas of forests, recognising that the State has prime statutory responsibility for forest management (clause 13 of the Scoping Agreement);
- to jointly accredit, to the maximum extent possible, data sets and processes for the purposes of the Regional Forest Agreement and to satisfy requirements of associated Tasmanian and Commonwealth statutory assessments, to provide free exchange of and open access to each party's data, and to clearly define data-ownership arrangements (clause 19 of the Scoping Agreement);
- to make available derived data and derived information sets to inform stakeholders at important stages during negotiations on the Regional Forest Agreement (clause 20 of the Scoping Agreement).

2.2 Objectives

Further guidance is provided under clause 4 of the Scoping Agreement, whereby Tasmania and the Commonwealth agreed to negotiate a regional forest agreement that meets the following requirements:

- defines and describes the means for conserving those forest areas needed to form a comprehensive, adequate and representative reserve system;
- defines those forest areas available for sustainable commercial use;



Box 2.2 The Tasmanian Forests and Forest Industry Strategy

Sections 3.2.3 and 3.2.4 of the Public Land Use Commission's Background Report Part A (PLUC 1996b) provide a comprehensive summary of the recommendations for the Forests and Forest Industry Strategy. The principle commitments of the Tasmanian Government are as follows.

Conservation management

- immediate protection of areas of highest conservation value in State reserves;
- areas of contentious public forest to be allocated to a deferred forest category and to be allocated progressively, on a shared basis, either to wood production or to conservation;
- withdrawal of some areas of public forest from wood production to provide for conservation and uses other than wood production in reserves;
- revocation of forest reserves only by parliamentary approval.

Security of the public forest resource supply

- State legislation to establish a register of public wood-production forests;
- sufficient areas of public forest placed in the register to meet agreed commitments for timber supply for up to 20 years;
- resource security to be sought through a forest agreement between the State and the Commonwealth, ratified by new Commonwealth legislation.

Management of public forests

- provide a minimum of 300 000 cubic metres per year of high-grade (categories 1 and 3) eucalypt sawlogs, managing public native forest on an 80–85 year rotation to optimise sawlog production;
- commercial thinning of the most productive regrowth native forests to be a priority to promote sawlog growth;
- management to be consistent with the Forest Practices Code and the Code to be reviewed to take account of matters such as steep slopes, stream protection, and biodiversity.

Special-species sawlogs and other forest products

- implement a blackwood management plan for public forests, with a minimum 10 000 cubic metres per year set as a supply target;
- minimum volumes set as supply targets for the following special timber species:
 - silver wattle—3000 cubic metres per year
 - Huon pine—500 cubic metres per year
 - deep-red myrtle and sassafras—5000 cubic metres per year in total.

Industry

- replace Concession Acts with Wood-Supply Agreements;
- a more competitive market for Crown wood, including tendering;
- a veneer plan to provide a transition to regrowth forest as the predominant veneer log supply.

Private forests

- future calculations of the continuing sustainable yield of wood products to be based on the results of regular scientific inventories;
- compensation to be paid to private forest owners where private forest is taken out of wood production for 'community benefit';
- protection of rare and endangered species on private forest lands.

- accredits codes of forest practice, including the process for continual improvement of those codes, and other management arrangements for forests;
- identifies options for forest resource use and sustainable industry development and examines any potential social and economic implications of these options;
- identifies the region's forestry and other industry potential;
- takes account of biodiversity and threatened species;
- takes account of heritage values;
- sets out performance indicators and monitoring arrangements to enable a detailed assessment of and report on the indicators and the agreement's performance every five years;
- provides a mechanism for updating the agreement in the light of important new information or exceptional circumstances.

The Joint Steering Committee's paper entitled 'Objectives for the Tasmanian Regional Forest Agreement' (December 1996) provides the framework for the integration and options-development process. It refines some of the objectives in the Scoping Agreement in order to provide clear guidance on the goals governments wish to achieve through the RFA process. Box 2.3 summarises the objectives set out in the Steering Committee's paper. Particular objectives relating to private forests are not listed in Box 2.3: the treatment of private forests is dealt with under other listed objectives.

The Steering Committee recognises that difficulties will arise in seeking to meet a number of these objectives concurrently. It also recognises that the objectives themselves do not identify the appropriate balance between environment, heritage, social and economic values. As a consequence, this report canvasses the issues and puts forward possible approaches to meeting the various objectives in a flexible way.

In the first instance, priority has been given to using public land in determining possible approaches to the comprehensive, adequate and representative reserve system. This is consistent with the JANIS criteria and the Steering Committee's objectives paper.

The submissions that have been received from interested parties are being assessed in terms of the principles and objectives outlined in this chapter.



Box 2.3 Objectives for the Tasmania–Commonwealth Regional Forest Agreement

Social and economic objectives

- Manage for a potentially expanding and sustainable level of high-grade eucalypt veneer and sawlogs from public forests—consistent with the Forests and Forest Industry Strategy (currently at a minimum of 300 000 cubic metres per year).
- Provide for the sustainable management of special-species timber—consistent with Forests and Forest Industry Strategy targets.
- Maximise the potential areas of public forest land available for thinning and plantation development, provided regional conservation and catchment management objectives are not compromised. The location of such areas should permit internationally competitive mill-door wood costs for processing plants.
- Maintain an aggregate area of multiple use forest at least equal to the area currently on the Register of Multiple Use Forest Land and capable of supporting the sustainable wood supply level and providing access to forested areas for apiarists, recreationalists, traditional land users, tourist operators, and other forest users.
- Provide for potential growth in Gross State Product, value of exports, and regional employment arising from forest industry development strategies that reflect market opportunities and the resource potential of the existing forest land base. The objective is to promote the development of internationally competitive industries that maximise the value added to the resource from forested land.
- Maintain access for mineral exploration and mining, particularly to strategic prospectivity zones and other identified areas of moderate to high or unknown mineral resource potential.
- For communities dependent on forested land,
 - ensure adequate access to social and physical infrastructure
 - ensure community viability
 - enhance quality of life.

Environment and heritage objectives

- Protection of a comprehensive, adequate and representative sample of forest biodiversity—consistent with the JANIS criteria—so that natural processes can continue and community and species diversity are maintained.
- Protection for vulnerable, rare and endangered forest ecosystem biodiversity—consistent with the JANIS criteria.
- Protection for old-growth forest—consistent with the JANIS criteria.
- Protection of high-quality wilderness—consistent with the JANIS criterion—paying particular attention to those areas that meet minimum-area requirements.
- Maximise protection of conservation values through reserve design, taking into account
 - landscape context
 - boundary–area ratio and size
 - shape
 - capture of values
 - connectivity.
- Protection of areas of high-quality habitat for biodiversity—consistent with the JANIS criteria—in particular for
 - rare, vulnerable and endangered species
 - special groups of organisms
 - areas of high diversity, refugia and endemism.
- Adequate protection of areas containing cultural, heritage (including World Heritage) and indigenous heritage values, in particular those of National Estate value.

Other objectives

- Ensure that Commonwealth and State legislative requirements are met.
- Ensure that effective and appropriate management systems and processes exist to provide for the conservation of values (drawing on the final recommendations of the Expert Advisory Group on Ecologically Sustainable Forest Management).
- Ensure that systems and processes provide for the effective and efficient implementation of management prescriptions required to protect identified values.

3 The current situation

3.1 Background

This chapter summarises information assembled during the comprehensive regional assessment of Tasmania's forests. Effectively, it is a description of the current situation in Tasmania in terms of the objectives of the Tasmania–Commonwealth Regional Forest Agreement (see Box 2.3).

The current situation largely reflects the outcomes of implementing the recommendations of government inquiries and agreements formulated in the last decade; for example, the Helsham inquiry and the Forests and Forest Industry Strategy (see Box 2.2). Among these outcomes were distribution and pricing reforms, industry development incentives, a regrowth transition strategy, and conservation advances.

The total land area of Tasmania is 6.8 million hectares. Native forest and plantations cover almost 3.4 million hectares. About 40 per cent of the forested area is public land available for wood production, about 30 per cent is privately owned, and about 30 per cent is protected public land.

Land classified as dedicated reserves covers 1.65 million hectares, or 24 per cent of the total land area; informal reserves cover 650 000 hectares, or 10 per cent of the total land area. Dedicated reserves are legislatively secure conservation reserves such as national parks, State reserves and forest reserves; informal reserves are not generally legislatively secure and include Crown Lands Act reserves and unresolved Recommended Areas for Protection. The environment and heritage report (PLUC 1996e) provides a full description of the categorisation of Tasmania's reserves.

For the purposes of this report, 'reserves' means both dedicated and informal reserves. Reserves generally are not available for wood production; informal reserves and some forest reserves are available for mineral exploration and possible mining, subject to Tasmanian legislation, regulations, codes of practice and reserve management plans.

The total area of State forest is 1.6 million hectares. Approximately 1.4 million hectares of this is Multiple Use Forest and 90 000 hectares is Deferred Forest (see PLUC 1996b for discussion). The balance is made up of forest reserves and Recommended Areas for Protection. An additional 230 000 hectares of Deferred Forest occurs on unallocated Crown land, bringing the total area of Deferred Forest to 320 000 hectares. Deferred Forest was set aside under the Forests and Forest Industry Strategy for further assessment of conservation and production values.

Multiple Use Forest and Deferred Forest are the base from which sustainable wood production on public land is determined. Objectives for wood production are pursued in tandem with objectives for a range of conservation values, the harvest of minor forest products, apiculture, mineral exploration and mining, recreation and tourism. Wood production is currently excluded from Deferred Forest lands.

Wood from private forest is an essential part of the wood supply for industry development in Tasmania. The total private land area in Tasmania is 2 688 700 hectares; 38 per cent of it is forest. Some 75 000 hectares is plantation and 773 000 hectares is native forest of commercial value. In 1994–95 over 50 per cent of Tasmania's hardwood pulpwood was harvested from private land. In 1994–95 the mill-door value of sawlogs and veneer logs harvested from private land was \$14 million. After processing, the value of the sawn timber from these logs was \$62 million, of which \$1.6 million worth was veneer. New hardwood and softwood private plantation establishment is occurring at a rate of more than 4000 hectares a year. A number of forestry companies, investment companies and landowners are establishing plantations on land no longer used for agriculture.

The forestry, minerals and tourism industries directly contributed to the Tasmanian economy in 1995–96 (see Table 3.1).



Table 3.1 The estimated direct contribution of the forest, minerals and tourism industries to the Tasmanian economy, 1995–96

Industry sector	Contribution to Gross State Product		Employment (no. of people)	Exports (\$ million)
	(%)	(\$ million)		
Forest industry	7.0	679	7 138	269
Minerals ^a	5.6	543	6 059	658
Tourism ^b	3.4	332	10 182	42
All industries	100.0	9 762	201 100 ^c	1 673

a. Includes contributions from imported raw materials.

b. Based on 1992 visitor data for intrastate, interstate and overseas visitors. Tourism contributions are not restricted to forested land.

c. Includes full and part-time employment. Other figures are full-time equivalents.

Sources: PLUC (1996f); Centre for Regional Economic Analysis data—see Appendix E.

In economic terms, Tasmania is much more dependent on forest industries for income, employment and wealth generation than any other Australian State or Territory. In 1995–96 forest industries—forestry and logging, sawmills, resawn and dressed timber, veneer, manufactured boards, woodchips, and pulp and paper—directly contributed just over 7 per cent of Gross State Product (see Table 3.1).

The minerals industries—mineral exploration, mining, mineral processing and metal fabrication—are of vital importance to the State’s economy and contributed 40 per cent of total Tasmanian international exports in 1995–96. Mineral exploration and mining are heavily dependent on access to forested land. Approximately 77 per cent of Tasmania’s total area is available for mineral exploration and mining. This includes forested and non-forested land, public land and private land.

Nearly 5 per cent of the Tasmanian workforce was directly employed in the tourism industry in 1995–96. Nature-based tourism is an important component of this: about 75 per cent of international and interstate visitors to Tasmania between 1993 and 1995 participated in nature-based tourism. The term ‘nature-based’ encompasses all forms of tourism in natural (including forested) areas.

Nature-based tourism is a growing industry in Tasmania: one of the main attractions is the diversity of landscapes and natural environments. Such tourism encompasses a variety of activities, which have varying requirements for access and facilities. In some cases these activities are interchangeable between reserves and multiple use forests; in other cases the opportunities presented by reserves and by multiple use forests complement each other.

3.2 The social and economic situation

This section summarises the main social and economic aspects of Tasmania’s forest resources and the associated communities and industries. The social and economic report and the final report on ecologically sustainable forest management provide details (see PLUC 1996f, 1997a).

In 1996 the hardwood forest industry sector directly employed 6558 people: 2484 were in forestry and logging, 2339 were in wood and wood products processing, and 1735 were in paper and paper products manufacturing. There is additional employment associated with processing of softwood logs, furniture making and printing, and there are areas of indirect employment such as transport. The Centre for Regional Economic Analysis (1989) has estimated that, after taking indirect effects into account, the 1989 contribution of the forest industries was 17 per cent of Gross State Product.

Other forest-related uses, such as tourism, recreation, mineral exploration, mining, apiculture, craftwood and firewood collection, are also important to the Tasmanian economy.

3.2.1 The supply of high-quality eucalypt sawlogs and veneer logs from public land

The Forests and Forest Industry Strategy (1990) commitment is to supply a minimum of 300 000 cubic metres a year of eucalypt veneer logs and sawlogs. This is premised on the long-term productivity of all forests listed on the Register of Multiple Use Forest Land and the Register of Deferred Forest Land. Deferred Forest Land contributes about 10 per cent of the statutory requirement.

The Forests and Forest Industry Strategy recommends that sustainable high-quality sawlog supply levels be reviewed on a five-yearly basis. Forestry Tasmania is now undertaking a review in the context of the RFA process. The review of sustainable yield takes into account changes arising from more intensive management regimes, changes in product utilisation, and measured changes in the forest inventory. Testing the data, models and systems for sustained yield estimation confirmed that, when applied to the existing Forests and Forest Industry Strategy land base and management strategies, the updated data, models and systems can deliver a sustainable high-quality eucalypt sawlog yield of 300 000 cubic metres a year from public land.

Forestry Tasmania has mapped areas of public land outside the existing reserve system that are potentially harvestable within existing management constraints and Forest Practices Code requirements. These areas are known as provisional coupes. Among them are the areas shown as of high importance for wood production on Map S&E 4.3 and areas within the special timbers management units shown on Map S&E 4.5 of the social and economic report (PLUC 1996f). They represent the maximum area currently considered economically viable for harvesting. Following detailed ground planning a smaller harvested area often results. About 800 000 hectares of Multiple Use Forest and 50 000 hectares of Deferred Forest is within provisional coupes.

The mill-door value of logs used by the eucalypt sawlog and veneer industry was estimated at \$37 million in 1994–95: \$23 million (or 60 per cent) of this came from logs from public land; the balance came from private land.

Almost 136 000 cubic metres of veneer and sawn timber were produced from public land by Tasmania's forest industries in 1994–95, with gross mill-gate values of \$8 million and \$92 million respectively. The figures are greatly increased if value-added products such as furniture are included.

Sawn timber and veneer products of higher value tend to be sold interstate. Less than 7 per cent of veneer is purchased by consumers in Tasmania: the majority goes to markets in Melbourne and Sydney, where high-quality veneer can sell for as much as \$4000 a cubic metre. Melbourne is a prime destination for sawn timbers, although markets in Hobart are also important.

Tasmania's hardwood sawmilling industry is characterised by mills of varied capacity and product mix. The five largest mills processed about 75 per cent of the State's sawlog supply in 1994–95. Tasmania has two large hardwood veneer mills and one smaller veneer mill. The large mills are located at Somerset in the north-west and Boyer, near Hobart, in the south; they produce decorative veneers from eucalypts, special-species timbers and radiata pine.

Hardwood pulp log production in Tasmania in 1994–95 was 3.262 million tonnes, sourced equally from public and private land. The estimated mill door value of pulp logs on public and private land used for chip and pulp and paper production was \$128 million (PLUC 1996f). The mill gate value of production in the same period for these products was \$680 million.

3.2.2 The supply of special-species timber

The minimum Forests and Forest Industry Strategy supply target for blackwood is 10 000 cubic metres a year; for silver wattle is 3000 cubic metres a year; for Huon pine is 500 cubic metres a year; and for deep-red myrtle and sassafras combined is 5000 cubic metres a year. About 14 000 cubic metres of special-species timber was harvested from Multiple Use Forest in 1995–96. This is less than the Strategy's special-species target of 18 500 cubic metres for two reasons:

- Access to special species on Deferred Forest Land is not available.
- Very wet summers in 1994–95 and 1995–96 interrupted the short harvesting season in the north-west.



The area of provisional coupes in special-species timber management units is 36 000 hectares. A further 79 000 hectares of provisional coupes with significant amounts of special-species timbers occurs outside the units.

The importance of these timbers as a raw material to supply the market for high-value Tasmanian products (including furniture, wooden boats, panelling, veneer and craft) was noted in the social and economic report (PLUC 1996f). Supply levels consistent with the Forests and Forest Industry Strategy, together with the continuing supply of other species (for example, celery-top pine), are sufficient to keep meeting the demand from these high-value markets.

Blackwood and the less favoured silver wattle are the only two major special-species timbers that can be grown to maturity within regenerated eucalypt forests that are managed for eucalypt veneer log and sawlog production. Blackwood is the only major special-species timber that can be grown commercially in plantations, although the costs of its establishment and early-age tending are considerably higher than for eucalypt and radiata pine.

Deep-red myrtle is predominantly found in forest on basalt soils.

The Huon pine target of 500 cubic metres a year is currently met from a variety of sources. The stockpile of Huon pine in Lake Gordon provides around 100 cubic metres a year and is sufficient for this rate to continue for 40 years. The balance of the Huon pine yield comes from the salvage of logs after floods and the recovery of fallen timber in places such as Teepookana, near Strahan. Standing Huon pine is not logged at present, although the possibility of sustainable logging at Teepookana is being investigated.

The total annual supply of special-species timber sawlogs from all sources for veneer slicing is no more than 2000 cubic metres. Special-species veneer is sold in Tasmanian, mainland and international markets; it is used for furniture, fine craft and decorative wall panels.

It is estimated that more than 130 people are directly dependent on the special-species timber industry. Seven sawmills specialise in such timbers, but many eucalypt sawmills and veneer mills also process some special-species timbers. Employment associated with furniture and craft based on special-species timbers would greatly increase this figure.

Businesses that sell products made from special-species timbers are particularly dependent on supply from mixed forests and rainforests. Dependence on rainforests will increase because of the transition to regrowth and regenerated forests, in which special-species timbers (other than blackwood and silver wattle) are unlikely to reach commercial size.

In the social and economic report the contribution of special-species sawn timber and veneers to the Tasmanian economy was estimated at \$15 million a year (PLUC 1996f). Use of these products in value-added applications such as furniture, boat building and interior design increases the economic contribution by four to six times.

3.2.3 Thinning and plantation development

Plantations in State forests have provided about 300 000 cubic metres of softwood pulpwood and between 220 000 and 300 000 cubic metres of softwood veneer and sawlogs annually in the same period. In 1994–95 softwood production from private plantations was approximately 470 000 cubic metres of which approximately 2000 cubic metres was used by domestic processors to produce sawn timbers and veneer.

In mid-1996 the total area in plantations was 138 000 hectares. Sixty-three thousand hectares of this was in State forest; comprising 49 000 hectares of softwood and 14 000 hectares of hardwood.

During the 1990s Tasmania's public and private plantation estate has expanded by more than 5000 hectares a year.

The current area of thinned eucalypt forest is 533 hectares and the current rate of thinning is 190 hectares a year. In 1995–96, 1900 hectares of plantation was established: 900 hectares was softwood and 1000 hectares was hardwood.

Hardwood plantations can also increase the productivity of native forest sites. Eucalypt plantations managed intensively for sawlog production can produce an estimated 3 to 7 cubic metres of sawlog per hectare per year, depending on site quality and intensity of management. A rotation age of around 25–40 years is envisaged for such plantations.

Thinning of native forest and plantation establishment—that is, intensification of forest management—offer important opportunities for increasing the quantity and quality of logs that can be harvested.



Thinning is designed to retain trees of high potential and remove those of lower potential. Sawlogs of suitable quality and size can be harvested from a site 20 years earlier than would otherwise be possible. Suitable native hardwood forest when thinned can produce an estimated 4 cubic metres of sawlog per hectare per year over 65 years; if not thinned, the same site will produce an estimated 2 cubic metres of sawlog per hectare per year over 85 years.

There has also been an increase in the area of forest managed on a partial harvesting regimes where the aim is to increase the proportion of sawlog harvested in the future.

3.2.4 Multiple use of forest areas

Multiple use in forest, or in land management generally means the management of a particular area for a variety of uses concurrently or sequentially. The uses may be permitted over the entire multiple use area or in defined parts or zones and priorities may be assigned particular uses. The range of uses permitted depends on the tenure category for the forest; for example, State reserve, State forest or private forest. Multiple use management is designed to achieve optimum management results in areas where a range of values and potential uses overlap.

Tasmania's forest areas are used for a great variety of commercial and private purposes. Eucalypt forestry, special timbers forestry, and mineral uses are described in Sections 3.2.1, 3.2.2, 3.2.3 and 3.2.6. Among other important uses are nature-based tourism, recreation, apiculture, firewood collection, and the harvesting of a range of minor forest products.

Commercial forest on the Register of Multiple Use Forest Land has wood production as a primary object of management. Tasmania's *Forestry Act 1920* requires that the public be consulted when decisions on management objectives and zoning of Multiple Use Forest are being made. Multiple use of forests in national parks and State reserves includes tourism, recreation, apiculture and scientific study.

Management plans for lands in National Parks and other reserves under particular tenures within Tasmania are also subject to public consultation.

Nature-based tourism

Nature-based tourism encompasses all forms of tourism in natural areas—ecotourism, unguided vehicle-based touring, guided nature-based tourism, adventure tourism, and so on. An assessment of the potential of nature-based tourism in Tasmania suggests that the high rates of growth (largely based on the national parks and the dedicated reserve system but supplemented by Multiple Use Forest and private land) experienced in the last decade will continue.

Some types of nature-based tourism require national parks and similar reserve status. State forests and State reserves represent alternative resources for some types of tourism and recreational activities. Some of the experiences offered by national parks and World Heritage areas can also be offered by State forests. For other tourism and recreational activities State forests and State reserves are complementary resources.

Nature-based tourism and recreation—estimated to contribute \$151 million to Gross State Product and result in the employment of about 3400 people (Centre for Regional Economic Analysis unpublished data)—offer significant employment opportunities for Tasmania as a whole, and particularly for a number of communities. In 1995–96 the number of visits to State forests was about 400 000 (showing growth of over 5 per cent a year); there were about 2 million visits to State reserves in the same year.³ About 70 per cent of the 500 000 adult visitors to Tasmania in 1995 visited national parks.

Cradle Mountain – Lake St Clair National Park is one of the most important components of the Tasmanian Wilderness World Heritage Area. The number of interstate and overseas visitors to the Cradle Mountain area increased from 34 500 in 1981 to 134 000 in 1995.

To identify the economic value of nature-based tourism, information on the main reasons people visited Tasmania and visitor expenditure was assessed. In a 1995 Department of Tourism survey, 47.4 per cent of interstate and overseas visitors listed 'touring/sightseeing' as the main purpose of their visit. Since 75 per cent of interstate and overseas visitors to Tasmania participated in nature-based experiences

³ The term 'visits' is used because multiple trips to forests by an individual cannot be identified from the statistics.



(PLUC 1996f), it is estimated that nature-based experiences are important to about 35 per cent of visitors.

Nature-based tourism is projected to double in the period to 2020 (PLUC 1996f).

The Centre for Regional Economic Analysis (unpublished data) modelled the impact of doubling the number of visitors to whom nature-based experiences are important, using estimates of visitor expenditure and other data. A doubling of nature-based tourism by 2020 could increase Gross State Product by as much as \$151 million, and there would be a concomitant increase in employment opportunities.

Using forests for other purposes

Apiculture relies on access to State reserves (including the World Heritage Area and State forests). In 1990–91 Tasmanian honey production was 972 tonnes, representing a farm-gate value of \$1.7 million and \$4.4 million in value-added terms. In addition, industries reliant on bees for pollination contributed an estimated \$111 million to the economy. Pollination services for a variety of horticulture and seed crops are a developing area of the apiculture industry.

Traditional recreational users depend on access to Multiple Use Forest, Deferred Forest and other forested land for many of their activities, including fishing, horse riding, four-wheel driving and hunting. It has not been possible to estimate a monetary value for these culturally important uses. The firewood industry also relies on access to multiple use forests (see PLUC 1996f).

3.2.5 The development of forest industries

In recent years \$270 million has been invested in replacement and upgraded technology and in new capacity in the hardwood processing sector, focusing on products for which Tasmania has a competitive advantage.

Among the recent investments have been \$24 million in upgraded technology and capacity expansion at hardwood sawmills, resulting in an additional 60 jobs and securing a number of existing jobs; the almost completed Starwood Australia medium-density fibreboard mill will result in an additional 126 jobs and exports of \$70 million; and Australian Newsprint Mills' investment of \$80 million in plantation development, effluent treatment and plant upgrading, helping to secure nearly 700 jobs.

In addition to the sawmills and veneer mills described in Sections 3.2.1 and 3.2.2, Tasmania has a particle board mill at Wesley Vale that uses softwood logs only, with capacity for 37 000 cubic metres of product a year. There are also three integrated paper mills, at Burnie and Wesley Vale in the north-west and at Boyer in the south. The Burnie and Wesley Vale mills produce printing and writing papers and the Boyer mill produces newsprint and some printing grades. The three mills use about 550 000 tonnes of eucalypt pulp logs and about 400 000 tonnes of radiata pine pulp logs each year. In 1994–95 Tasmania exported an estimated 3.1 million tonnes of hardwood woodchips, valued at \$212 million; this total value represents over 40 per cent of the value of hardwood woodchip exports from Australia. Woodchips are exported from five sites at three general locations: Triabunna, the Tamar and Burnie.

3.2.6 Mineral exploration and mining

Tasmania is endowed with a variety of mineral deposits, many of which are recognised as being of world class (see PLUC 1996f, vol. III for details).

Most of the State's major mines are in forested land and much of the area of significant potential for future discoveries is also in forest. Map 3.1 shows Tasmania's weighted composite mineral resource potential. Appendix E describes the methodology used to determine this mineral resource potential.

Mining, although locally intrusive, occupies only a very small area. Mining leases cover 53 547 hectares, or 0.78 per cent of Tasmania's area. This includes all scales of operation, from major mines to council gravel pits and inactive leases and specific infrastructure such as roads and pipelines. In addition, not all of the land on active leases is mined at any one time and not all of the land on active leases is forested. In 1995–96 about 6060 people were directly employed in Tasmania's minerals industries; this is about 3 per cent of the total Tasmanian workforce. The gross value of mining and mineral processing output in



1995 was over \$1.2 billion; mining and mineral processing exports for 1995–96 amounted to \$658 million, about 40 per cent of the value of Tasmania's total exports.

Most of the direct employment in the mining industry is attributable to five major mines, which primarily produce zinc, lead, copper, tin and iron ore. Four of these mines access resources beneath forested land:

- Pasma Mining—Rosebery operates a base metals mining operation that produces zinc, lead and copper concentrates and a gold–silver ore. Pasma is currently involved in a four-year, \$45 million development and exploration program to define additional reserves below the mine's existing workings. Approximately 51 per cent of the feedstock for Pasma's EZ smelter at Risdon in the south of the State comes from Tasmanian mines.
- Aberfoyle Limited operates the Hellyer zinc–lead–silver mine. It is expected that reserves will be depleted at Hellyer by around 2001.
- RGC (Tasmania) Ltd has recently expanded the Renison tin mine through the development of additional deeper reserves. The \$34 million dollar project, which began in 1994, will extend the Renison mine's expected operating life from three years to 10–16 years.
- The Savage River iron ore mine will recommence mining and processing operations in October 1997. About \$110 million is being invested to re-establish this mine.

Current arrangements for managing the environmental impacts of minerals exploration and mining are described in the social and economic report (see PLUC 1996f, vol. III). The impacts of modern minerals exploration, mining and metallurgical industries can be mitigated through effective planning and management but cannot be totally eliminated.

The *Mineral Resources Development Act 1995* provides for environmental conditions to be imposed on mining and exploration leases. Environmental permits take into account site-specific factors such as the visual impact, faunal and floral values, water and air quality, dust emissions, and archaeological and heritage values. Operating mines are also subject to regular inspection by Environment Tasmania, in accordance with the *Environmental Management and Pollution Control Act 1994*, the Workplace Standards Authority and Mineral Resources Tasmania. Mineral Resources Tasmania inspects all field exploration activities and requires rectification work where ground disturbance has occurred or where the Mineral Exploration Code of Practice has been breached.

Since the early 1960s, mineral exploration programs have been conducted in areas identified as having high-quality wilderness values (PLUC 1996e).

Historical data show that there is usually a positive correlation between the level of exploration expenditure and the number of discoveries in an area. On average, \$51 million in mineral exploration investment is required to discover an economic mineral deposit in Australia. Recent expenditure on exploration and retention licences in Tasmania has ranged from \$4.7 million in 1992 to about \$10 million in 1989 and 1995.

The Tasmanian Government enacted the *Mining (Strategic Prospectivity Zones) Act 1993* specifically to provide security for land and resource access and to allay the mineral industry's concern resulting from the creation of new reserves in 1989. Under the Act, eight large areas of Crown land were designated Strategic Prospectivity Zones. Five of these zones—Balfour, Arthur, Zeehan–Waratah, Mt Read and Cape Sorell—are in forested areas of western and north-western Tasmania. The land tenure status of Crown land in Strategic Prospectivity Zones can be changed only with the approval of both houses of Parliament, and the holder of any mining tenement affected by those changes would be entitled to compensation by the State.

3.2.7 Social infrastructure and community viability

Tasmania has the most decentralised population of any Australian State or Territory: approximately 60 per cent of the population lives outside the capital city of Hobart. The largest proportion (48.2 per cent) of the population resides in the Greater Hobart – Southern region, 28.2 per cent are located in the Northern region and 23.6 per cent in the Mersey–Lyell region. The population is concentrated in four urban centres: Hobart, Launceston, Burnie and Devonport.

Population mobility is relatively low: 57 per cent of Tasmanians have lived at the same address for the past five years. The resident population growth rate between 1971 and 1994 was less than 1 per cent, the lowest in Australia. The 1993–94 Australian population growth rate was more than five times greater than that for Tasmania, and during 1995–96 there was an estimated net migration loss of 2200 people from the State. This migration is generally attributed to Tasmanians moving interstate to seek employment. 35.6 per cent of the population has formal qualifications. Education retention rates to Year 12 are much lower in Tasmania (59.7 per cent) than in Australia as a whole (72.2 per cent).

Tasmania's unemployment rate in 1994–95 was the highest of any State or Territory.

Tasmania has the lowest level of household and business income of any Australian State or Territory, as measured by average weekly earnings or Gross State Product per capita. This relatively low level of income, combined with other demographic and labour market statistics, serves to emphasise the importance of facilitating economic growth for all Tasmanian industries, including those dependent on forested land.

Forestry is important to a number of communities in Tasmania, particularly those in the north-east and north-west, on the east coast and in the south. Of note are the city of Burnie, the town of Smithton, and hamlets such as Forest, Irishtown and Hellyer in the north-west; the main centres of Launceston and Devonport in the mid-north; towns such as Fingal and Scottsdale in the north-east; Triabunna on the east coast; and southern communities such as Geeveston, New Norfolk and the outer suburbs of Hobart. Larger wood-processing plants are found at Burnie, Wesley Vale, Longreach, Smithton, Triabunna and New Norfolk; smaller mills are scattered throughout the State. The west coast is particularly important for special-species timbers, and is the State's main mining area; the towns of Queenstown, Zeehan, Rosebery, Waratah and Strahan are of note.

The social and economic report (see PLUC 1996f, vol. I) found that those communities most sensitive to changes in the forestry sector have the following characteristics:

- small populations with limited diversity;
- limited population growth;
- low mobility;
- low levels of home ownership;
- high unemployment;
- a restricted industry base;
- a number of forest-related industries in the area;
- a high degree of local expenditure by forest industries;
- a high proportion of the population involved in forestry activities;
- limited service provision;
- low community vitality—as measured by a lack of political efficacy, limited participation in community groups, low levels of cooperation between community members, high crime rates, lack of community pride, and a low degree of sense of community.

The communities found to exhibit some or all of these characteristics are mainly in the north-west, on the east coast and in the south of the State. For example, Circular Head Municipality in the north-west has always been strongly dependent on forestry, agriculture and fishing and is a relatively self-contained social and economic catchment. There is a high degree of local expenditure by forest-related industries and forest industry employees are reliant on social infrastructure services available in Smithton, which has a population of about 3600 and two primary and two secondary schools. Although a relatively small



town, it has a range of retail and trade outlets and services the entire municipality. Burnie serves as the primary centre for the Circular Head area.

Triabunna is the centre for a number of forest-related industries, including a woodchip mill, a sawmill and a number of logging and transport contractors. Other services in the town rely heavily on business from the forest sector. Forest industry employees and their families often have children of pre-school or primary school age; there is thus greater reliance on education, health, and sport and recreation services. Triabunna has a population of about 830 and has one primary school and a district high school offering education to the end of Year 10. The town has a number of retail and trade services and one bank.

A number of communities in Tasmania have, because of their vitality, been relatively more successful in managing change. For example, Scottsdale in the north-east of the State has a more diverse industry base and has capitalised on the development of the softwood industry in the area. There are two pine mills in the town and forestry activity relies on the plantation resource and some native forest logging.

Agriculture, particularly vegetable growing, dairying and grape growing for wine, are important contributors to the local economy.

Deloraine is an example of a community that historically has relied quite heavily on the timber industry. It has now become a commuter town for many people working in and around Launceston. Tourism is a developing industry in the area.

In many of Tasmania's rural communities attachment to place and sense of community are strong; this is demonstrated by length of residence and the extent of familial networks. On average, people working in the forest industry have lived at the same address for 10 years and in their particular localities for 22 years. About 65 per cent have their immediate family living in the area and, among those who are married, 43 per cent have their partner's family also living locally. In addition to social networks, lifestyle was noted as one of the main factors influencing place of residence. Typically, forest industry employees identified community networks, the aesthetic value of the environment, access to recreational pursuits, and proximity to work as the main factors influencing their attachment to place (see PLUC 1996f, vol. I).

Forestry-related changes are only some of a multitude of changes being experienced by rural communities across Tasmania and in many other parts of Australia. Loss of social infrastructure, local business closures, high unemployment, the migration of young people to bigger centres, and uncertainty are common themes.

3.3 The environment and heritage situation

This section summarises the main environment and heritage aspects of Tasmania's forested areas. The environment and heritage report provides details (see PLUC 1996e).

Tasmania has an important role in the conservation of Australia's forested heritage, having eight (all including forest) of the 80 bioregions (interim biogeographic regions) recognised at the national level. Seven of these ecosystems are unique or restricted; that is, they are not shared with other States.

Tasmania's status as a refuge for endemic species is partly a result of its Gondwanan origin (which it shares with the rest of Australia) and partly as a result of its isolation from the mainland for prolonged periods of its history.

Tasmania's forests contain some of the tallest flowering plants in the world and provide critical habitat for many high profile species, such as swift parrot, giant burrowing crayfish and spotted quoll.

Tasmanian forests also contain a diversity of cultural heritage sites of great scientific value and importance to the community at large. Aboriginal sites are ubiquitous and varied and include artefacts, artefact shelters, and some quarries and rock shelters. The Aboriginal community attaches great importance to these sites and their presence in the landscape. Historic sites are many and relate to the occupation and use of the land; among them are forest operation sites, mining sites and equipment, townships and communication sites. Many of these sites are extremely fragile and easily damaged.

With the exception of the Australian Capital Territory, Tasmania has a greater proportion of its area reserved (34 per cent) and of its forests reserved (30 per cent) than any other jurisdiction in Australia. The existing reserve system includes significant areas, such as the Tasmanian Wilderness World Heritage Area and many other areas also on the Register of the National Estate.

Over the last 200 years there has been significant loss to conservation and heritage values mostly associated with historical patterns of agricultural land clearance, forestry and mining (see PLUC 1996e).



Forest communities have generally contracted in range, some of them to such an extent that they have become vulnerable or endangered. Some species have become extinct and for others there are increased risks of extinction. Many more have significantly reduced populations or reductions in distribution or both. Many ecological processes, such as fire, have been greatly altered. Legislative and administrative mechanisms have been established to manage the impacts of many threatening processes. The report of the Expert Advisory Group on Ecologically Sustainable Forest Management makes specific recommendations in connection with the capacity of these systems and processes to meet management objectives.

The sections that follow summarise the current situation and the extent of protection of environment and heritage values. See Box 3.1 for a discussion of the meaning of ‘protection’ as described by JANIS.

3.3.1 Representative samples of forest ecosystems

Forest communities

The Tasmanian comprehensive regional assessment identified 50 forest communities, that represent the diversity of forest ecosystems in Tasmania (PLUC 1996e). Their protection in a comprehensive, adequate and representative reserve system is necessary to ensure the continued viability of forest ecosystems. Eighteen of the 50 communities meet or exceed the JANIS reservation criteria: eight eucalypt communities, the tall and short rainforests, and all of the native conifer forests, including four that are rare, vulnerable or endangered (see Table 3.2). The current area of three of the rare, vulnerable or endangered communities is less than 1000 hectares. Approximately 90 per cent of the estimated pre-1750 coverage of the 18 forest communities exists today. Over 70 per cent of the protected area is in dedicated reserves. The communities vary in area from 377 870 hectares for short rainforest to 190 hectares for pencil pine –deciduous beech.

Box 3.1 The meaning of ‘protection’

Protection can be combined through dedicated reserves, informal reserves and on and off reserve management prescriptions.

Protection can be achieved through dedicated reserves, which form one component of the comprehensive, adequate and representative reserve system. Dedicated reserves ensure security of tenure for nature conservation. They can remove or manage disturbance regimes that can compromise significant values. The tenure of such a reserve is considered secure if parliamentary action by either the Commonwealth or a State or a Territory government is required to revoke the reserve.

Informal reserves are areas where it is not possible or practical to protect conservation values in dedicated reserves. These areas are reserved under less secure tenure or management arrangements; for example within approved management plans. In practice, such areas should be set aside specifically for conservation purposes and meet the following criteria:

- They are established in approved management plans and managed accordingly.
- There is an opportunity for public comment on changes to reserve boundaries.
- They are able to be accurately identified on maps.
- They are of an area and design sufficient to maintain the values they seek to protect.

Protection by prescription (for example, recovery plans) may occur when it is impractical to protect a value in either dedicated or informal reserves. Such protection may focus on priority forest species and ecosystems through prescriptions in codes of practice or approved management plans. These prescriptions should meet the following criteria:

- There is an opportunity for public comment on proposed changes.
- They have a sound scientific basis.
- They are adequate to maintain the values they seek to protect.

In terms of the JANIS criteria, there is a shortfall in the area currently reserved for the remaining 32 forest communities (see Table 3.2). The shortfall is 215 510 hectares. Approximately 53 per cent of

the estimated pre-1750 coverage of these 32 communities exists today and, overall, 53 per cent of the current protected area for these communities is in dedicated reserves. For three communities less than 5 per cent of the current area of each is reserved, for 17 communities there is insufficient public land to satisfy the JANIS criteria.

Other elements of biodiversity

The Interim Biogeographic Regionalisation of Australia provides an appropriate scale for assessment of representativeness. Representative reservation of forest communities across biogeographic regions is important because diversity within the same community will often differ across the landscape. Most of the 50 forest communities do not occur in all the eight IBRA bioregions in Tasmania. Eleven forest communities are not represented in reserves in all the bioregions in which they occur. These are generally the dry forest types in the east and north-east of the State, and this constitutes a deficiency in biodiversity protection.

3.3.2 Rare, vulnerable and endangered forest ecosystem biodiversity

Table 3.3 shows the 20 rare, vulnerable or endangered forest communities in Tasmania. These communities are naturally rare or are rare due to significant depletion. Fourteen of the communities are considered rare or endangered; the remainder are considered vulnerable.

Protection for four communities—pencil pine – deciduous beech; pencil pine; King Billy pine, and King Billy pine – deciduous beech—meets the JANIS criteria. For 15 of the remaining 16 communities there is insufficient area on public land to meet the JANIS criteria.

Under current planning arrangements for forestry operations on public land, approximately 14 000 hectares of mapped forest containing 12 rare, vulnerable or endangered communities are in provisional coupes.

3.3.3 Old-growth forest

Old-growth forests are a representation of the mature age of a forest with little human disturbance. They contain biological attributes, such as tree hollows, that are important to forest-dependent species.

Old growth was assessed for 43 forest communities; 11 of the 43 communities were identified as rare or depleted. The JANIS criteria are met or exceeded for 14 of the 43 communities (see Table 3.4). Ten of the 14 communities also meet the forest biodiversity criteria. For 16 of the 29 communities that do not meet the JANIS criteria there is insufficient area on public land to meet the criteria. Old growth was not assessed for the three Bass Strait island communities (Furneaux *E. viminalis*, Furneaux *E. nitida*, and King Island *E. globulus*) and three seral communities (silver wattle, blackwood on rises and blackwood on flats). No old growth was identified for *E. morrisbyi*. The combined JANIS criteria for forest biodiversity and old growth are met for all native conifer forests, short rainforest, and four eucalypt communities.

Under current planning arrangements for forestry operations, approximately 2200 hectares of old-growth forest containing 10 rare and depleted communities are mapped in provisional coupes.



Table 3.2 Forest community reservation analysis

Forest community	Present area (ha)	Estimated pre-1750 area (ha)	Total reserved area (ha)	% of pre-1750 area reserved			JANIS criteria (%)
				Dedicated reserves	Informal reserves	Total	
Communities meeting JANIS forest community criteria							
<i>E. tenuiramis</i> on granite	3 020	3 200	1 320	41	0	41	
<i>E. tenuiramis</i> on dolerite	8 430	8 900	3 570	26	14	40	
<i>E. nitida</i> dry	159 850	174 400	120 850	54	15	69	
<i>E. delegatensis</i> dry	289 530	317 900	74 800	16	7	24	
<i>E. coccifera</i>	54 540	59 200	37 690	49	15	64	
<i>E. subcrenulata</i>	10 240	10 600	8 510	73	8	81	
<i>E. nitida</i> wet	74 410	87 400	64 090	58	16	73	
<i>E. delegatensis</i> wet	285 720	316 800	75 080	18	6	24	
<i>Allocasuarina verticillata</i>	1 430	3 500	530	12	3	15	
<i>Acacia dealbata</i>	54 090	59 000	9 740	7	10	17	
Pencil pine ^b	330	700	330	48	0	48	
Pencil pine – deciduous beech ^b	190	260	190	73	0	73	
King Billy pine ^b	18 090	20 000	14 700	43	30	73	
King Billy pine – deciduous beech ^b	790	800	630	23	51	74	
Huon pine	8 600	11 000	6 720	45	6	61	
Tall rainforest	192 010	212 700	86 580	22	19	41	
Short rainforest	377 870	401 100	231 610	41	17	58	
<i>Leptospermum lanigerum</i> – <i>Melaleuca squarrosa</i> swamp forest	18 950	40 800	8 590	19	2	21	
Subtotal	1 558 090	1 728 260	745 530				



Table 3.2 (cont'd) Forest community reservation analysis

Forest community	Present area (ha)	Estimated pre-1750 area (ha)	Total reserved area (ha)	% of pre-1750 area reserved			JANIS criteria (%)
				Dedicated reserves	Informal reserves	Total	
Communities below JANIS forest community criteria							
Coastal <i>Eucalyptus amygdalina</i>	190 210	357 800	32 510	6	3	9	
<i>E. amygdalina</i> on dolerite	178 300	248 100	13 640	3	3	6	
<i>E. amygdalina</i> inland ^b	25 800	76 900	1 400	1	1	2	
<i>E. amygdalina</i> on sandstone ^b	30 110	114 300	1 810	1	1	2	
<i>E. viminalis</i> – <i>E. ovata</i> – <i>E. amygdalina</i> – <i>E. obliqua</i> damp sclerophyll forest	40 630	89 100	6 510	5	3	7	
Grassy <i>E. globulus</i> ^b	14 450	28 500	4 230	12	3	15	
<i>E. pulchella</i> – <i>E. globulus</i> – <i>E. viminalis</i> grassy/shrubby forest	151 310	219 100	13 960	3	3	6	
<i>E. viminalis</i> grassy	113 310	242 900	1 450	0	0	1	
<i>E. viminalis</i> ± <i>E. globulus</i> coastal shrubby forest ^b	1 220	4 700	280	5	1	6	
Inland <i>E. tenuiramis</i> ^b	55 010	123 800	3 260	1	1	3	
<i>E. sieberi</i> on granite	17 660	19 400	2 190	3	8	11	
<i>E. sieberi</i> on other substrates	46 000	52 200	6 250	7	5	12	
<i>E. obliqua</i> dry	164 140	258 200	36 910	6	8	14	
<i>E. pauciflora</i> on dolerite	18 810	27 800	2 350	1	7	8	
<i>E. pauciflora</i> on sediments	16 200	31 400	3 910	9	3	12	
Furneaux <i>E. nitida</i>	29 810	40 600	5 550	10	4	14	
Furneaux <i>E. viminalis</i> ^b	140	200	0	0	0	0	1
Shrubby <i>E. ovata</i> ^b	7 210	232 000	270	0	0	0	1
<i>E. rodwayi</i>	8 670	11 900	280	0	2	2	
<i>E. risdonii</i> ^b	370	500	170	7	25	32	
<i>E. morrisbyi</i> ^b	20	250	0	0	0	0	1
<i>E. obliqua</i> wet	425 700	606 800	76 060	6	7	13	



Table 3.2 (cont'd) Forest community reservation analysis

Forest community	Present area (ha)	Estimated pre-1750 area (ha)	Total reserved area (ha)	% of pre-1750 area reserved			JANIS criteria (%)
				Dedicated reserves	Informal reserves	Total	
<i>E. regnans</i>	76 050	99 900	13 390	6	8	14	
<i>E. brookeriana</i> ^b	4 560	13 500	270	0	2	2	
King Island <i>E. globulus</i> – <i>E. brookeriana</i> – <i>E. viminalis</i> ^b	2 420	58 300	130	0	0	0	1
<i>E. viminalis</i> wet ^b	4 180	78 100	320	0	0	0	1
<i>Notelaea ligustrina</i> and/or <i>Pomaderris apetala</i> closed forest ^b	290	300	190	63	0	63	1
<i>Callitris rhomboidea</i> ^b	790	1 100	260	17	5	23	
<i>Banksia serrata</i> woodland ^b	160	200	120	50	0	50	1
<i>Acacia melanoxylon</i> on flats	9 010	16 100	970	4	2	6	
<i>Acacia melanoxylon</i> on rises	13 310	20 400	1 320	3	4	6	
<i>Melaleuca ericifolia</i> coastal swamp forest ^b	600	19 600	220	1	0	1	1
Subtotal	1 646 450	3 093 950	230 180				
Total	3 204 540	4 822 210	975 710	13	7	20	

.. Not applicable.

a. Total area above the JANIS criteria (see Box 2.1).

b. Rare, vulnerable or endangered forest communities.

c. JANIS criterion is per cent of existing area.

Note: Analysis includes rare, vulnerable or endangered forest community analysis.

Source: PLUC (1996e).

Table 3.3 Current levels of reservation for rare, vulnerable or endangered forest communities in relation to the JANIS criteria

Forest community	Present area (ha)	Existing area reserved (%)	JANIS criteria (% of existing area)	Area below JANIS criteria (ha)	Area on public land outside existing reserves (ha)	Area on private land (ha)
Pencil pine	330	100	60	0	..	..
Pencil pine – deciduous beech	190	100	60	0	..	..
King Billy pine	18 090	81	60	0	..	..
King Billy pine – deciduous beech	790	80	60	0	..	..
<i>E. amygdalina</i> inland	25 800	5	60	14 080	1 810	22 590
<i>E. amygdalina</i> on sandstone	30 110	6	60	16 260	10 670	17 630
Grassy <i>E. globulus</i>	14 450	29	60	4 440	2 380	7 840
<i>E. viminalis</i> ± <i>E. globulus</i> coastal shrubby forest	1 220	24	60	450	20	910
Inland <i>E. tenuiramis</i>	55 010	6	60	29 750	5 000	46 760
<i>E. risdonii</i>	370	45	60	60	10	200
<i>E. brookeriana</i>	4 560	6	60	2 470	2 050	2 240
<i>Callitris rhomboidea</i>	790	33	60	200	250	280
Furneaux <i>E. viminalis</i>	140	0	100	140	120	20
Shrubby <i>E. ovata</i>	7 210	4	100	6 940	360	6 580
<i>E. morrisbyi</i>	20	0	100	20	0	20
King Island <i>E. globulus</i> – <i>E. brookeriana</i> – <i>E. viminalis</i>	2 420	5	100	2 300	540	1 760
<i>E. viminalis</i> wet	4 180	8	100	3 860	1 000	2 860
<i>Notelaea ligustrina</i> and/or <i>Pomadereis apetala</i>	290	69	100	100	60	40
<i>Banksia serrata</i> woodlands	160	74	100	40	0	40
<i>Melaleuca ericifolia</i> coastal swamp forest	600	37	100	380	180	200
Total	175 160			81 490	24 450	109 970

.. Not applicable.

Table 3.4 Old-growth reservation analysis

Forest community	Total old-growth area (ha)	Total area of reserved old growth (ha)	Proportion of old growth reserved (%)			JANIS criteria (%)
			Dedicated reserves	Informal reserves	Total	
Communities meeting JANIS old-growth criterion						
<i>E. nitida</i> dry	107 370	85 460	60	20	80	60
<i>E. pauciflora</i> on sediments	4 300	2 720	52	11	63	60
<i>E. coccifera</i>	32 630	25 690	61	18	79	60
<i>E. subcrenulata</i>	7 420	6 500	80	8	88	60
<i>E. nitida</i> wet	49 600	45 290	70	21	91	60
<i>Notelaea ligustrina</i> and/or <i>Pomaderris apetala</i>	270	190	70	0	70	60
<i>Banksia serrata</i> woodlands	160	120	75	0	75	60
Pencil pine – deciduous beech	170	170	100	0	100	60
Pencil pine	330	330	100	0	100	60
King Billy pine	17 300	15 290	58	30	88	60
King Billy pine – deciduous beech	370	340	46	46	92	60
Huon pine	7 570	6 650	80	8	88	60
Short rainforest	335 800	223 290	48	19	67	60
<i>Leptospermum lanigerum</i> – <i>Melaleuca squarrosa</i> swamp	9 960	7 620	74	3	76	60
Subtotal	573 250	419 660				
Communities below JANIS old-growth criterion						
Coastal <i>Eucalyptus amygdalina</i>	40 080	12 610	26	5	31	60
<i>E. amygdalina</i> on dolerite	30 490	5 790	5	14	19	60
<i>E. amygdalina</i> inland ^a	2 860	140	2	2	5	100
<i>E. amygdalina</i> on sandstone	6 600	700	4	6	11	60
<i>E. viminalis</i> – <i>E. ovata</i> – <i>E. amygdalina</i> – <i>E. obliqua</i> damp sclerophyll ^a	2 500	670	14	13	27	100
Grassy <i>E. globulus</i>	4 910	2 720	53	2	55	60
<i>E. pulchella</i> – <i>E. globulus</i> – <i>E. viminalis</i> grassy/shrubby forest	63 840	9 140	8	6	14	60
<i>E. viminalis</i> grassy ^a	8 490	530	5	1	6	100



Table 3.4 (cont'd) Old-growth reservation analysis

Forest community	Total old-growth area (ha)	Total area of reserved old growth (ha)	Proportion of old growth reserved (%)			JANIS criteria (%)
			Dedicated reserves	Informal reserves	Total	
<i>E. viminalis</i> ± <i>E. globulus</i> coastal	870	130	12	3	14	60
<i>E. tenuiramis</i> on granite	2 900	1 280	44	0	44	60
<i>E. tenuiramis</i> on dolerite	5 490	2 190	26	14	40	60
Inland <i>E. tenuiramis</i>	7 970	820	4	6	10	60
<i>E. sieberi</i> on granite ^a	960	180	11	7	19	100
<i>E. sieberi</i> on other substrates ^a	1 660	320	9	10	19	100
<i>E. obliqua</i> dry	46 960	19 110	16	24	41	60
<i>E. delegatensis</i> dry	79 820	40 100	39	11	50	60
<i>E. pauciflora</i> on dolerite ^a	1 870	910	10	39	49	100
Shrubby <i>E. ovata</i> ^a	470	110	4	19	24	100
<i>E. rodwayi</i> ^a	730	120	1	15	16	100
<i>E. risdoni</i> ^a	10	0	0	0	0	100
<i>E. morrisbyi</i> ^b	0	0	0	0	0	0
<i>E. obliqua</i> wet	83 490	28 920	20	14	35	60
<i>E. regnans</i>	13 290	4 900	24	13	37	60
<i>E. delegatensis</i> wet	104 420	50 880	41	7	49	60
<i>E. brookeriana</i> ^a	690	40	1	4	6	100
<i>E. viminalis</i> wet ^a	140	60	35	7	42	100
<i>Allocasuarina verticillata</i>	970	440	41	5	46	60
<i>Callitris rhomboidea</i>	600	230	33	5	38	60
Tall rainforest	159 650	79 280	27	23	50	60
<i>Acacia melanoxylon</i> on flats ^b	0	0	0	0	0	
<i>Melaleuca ericifolia</i> coastal swamp forest	310	30	0	10	10	60
Subtotal	673 040	262 350				
Total	1 246 290	682 020	39	16	55	

.. Not applicable.
community.

a. Rare and depleted old-growth community
Source: PLUC (1996e).

b. No mapped old-growth in this



Table 3.5 Current levels of reservation of rare or depleted old-growth forests in relation to the JANIS criteria

hectares

Forest community	Present area	Existing area reserved	Area below JANIS criteria	Area on public land outside reserves	Area on private land
<i>Eucalyptus amygdalina</i> inland	2 860	140	2 720	110	2 610
<i>E. viminalis</i> - <i>E. ovata</i> - <i>E. amygdalina</i> - <i>E. obliqua</i> damp sclerophyll	2 500	670	1 830	1 510	320
<i>E. viminalis</i> grassy	8 490	530	7 960	980	6 980
<i>E. sieberi</i> on granite	960	180	780	680	100
<i>E. sieberi</i> on other substrates	1 660	320	1 340	970	370
<i>E. pauciflora</i> on dolerite	1 870	910	960	500	460
Shrubby <i>E. ovata</i>	470	110	360	60	300
<i>E. rodwayi</i>	730	120	610	60	550
<i>E. risdonii</i>	10	0	10	0	10
<i>E. brookeriana</i>	690	40	650	70	580
<i>E. viminalis</i> wet	140	60	80	50	30
Total	20 380	3 080	17 300	4 990	12 310

Protecting rare and depleted old-growth forest

As noted, 11 forest communities were identified as containing elements of old-growth forest that were rare or depleted (see Table 3.5). For most of these communities, their remaining unreserved distribution is predominantly on private land.

3.3.4 Protecting the area of high-quality habitat for biodiversity

Current protection of areas of high-quality habitat for biodiversity takes into account four categories:

1. the special needs of rare, vulnerable or endangered species;
2. special groups or organisms—for example, species with complex habitat requirements;
3. those species whose distributions and habitat requirements are not well correlated with any particular habitat;
4. areas of high species diversity, natural refugia for flora and fauna, and centres of endemism.

Species covered by categories 1, 2 and 4 are discussed in this section; species falling into category 3 were identified during the National Estate assessment of biodiversity values (see PLUC 1997c). The process used to determine levels of protection and management requirements for rare, vulnerable or endangered species are described in a separate report, which is due to be released in April 1997 and will be available from the Public Land Use Commission (PLUC 1997d).

Map 3.2 shows the verified locations of some flora and fauna species for which protection of all occurrences is recommended (see PLUC 1997d). Additional locations are being verified for other

species following completion of the categorisation described in the following paragraphs. As shown on Map 3.2, a majority of the verified locations of species is on private land.

Flora

A joint Tasmania–Commonwealth technical assessment, confirmed by a panel of Tasmanian botanists, classified the Tasmanian flora into six categories for the purpose of determining preliminary management requirements.

Categories 1 to 4 list flora in accordance with the IUCN Red List categories of threat. Category 5 contains species that are insufficiently known to classify as threatened but that may be at risk, are taxonomically uncertain, that are presumed extinct in Tasmania. Category 6 consists of those species which are not forest dependent or are widespread, common and abundant and are dealt with through other mechanisms.

The 170 flora species in categories 1 to 5 constitute all forest-associated species listed as endangered or vulnerable under Commonwealth or State legislation plus State-listed rare species and some non-forest dependent State-listed endangered or vulnerable species. Table 3.6 shows the recommended conservation levels for these categories.

Fauna

A panel of experts classified the Tasmanian fauna into seven categories and made a number of recommendations.

Categories 1 and 2 contain species that have extremely restricted distributions or are endangered species considered to be adversely affected by logging. Protection of all known locations was considered necessary for the eight category 1 species. For the 12 category 2 species it was considered that a combination of protection of their core habitats and management prescriptions elsewhere was necessary.

Table 3.6 Flora species protection and management priority categories

Priority category	No. of species ^a	Percentage of core populations to be protected	Percentage of core populations to be managed by prescription
1	30	100	..
2	48	80	20
3	46	60	20 (to 40)
4	24	30	30 (to 50)
5	22	Case-by-case assessment	Case-by-case assessment
6	Undefined	..	..

.. Not applicable. a. Preliminary figures.

It was recommended that the 15 category 3 species be managed by prescription because they occur in small areas that are logistically difficult to protect formally.

The 23 category 4 species are species that use tree hollows. Special measures for these species involve protecting representative areas of old-growth forest and ensuring that tree hollows are present through the matrix of regrowth forest. Further measures may be required for some hollow-using species.

The 12 category 5 species are cave-dwelling species and it was recommended that special management prescriptions be developed for karst areas.

The 17 category 6 species are those whose distribution or habitat requirements are poorly known. No recommendations were made in relation to their conservation, although species considered to require urgent conservation attention were identified.

Category 7 species are species listed in the environment and heritage report (PLUC 1996e, vol. I, table 2.1) as being excluded from further consideration.



Recovery plans

Recovery plans must be developed for species listed as endangered or vulnerable under the Commonwealth's *Endangered Species Protection Act 1992*. Tasmania has 13 species listed as endangered; 10 of them have recovery plans. One species was researched as part of the comprehensive regional assessment process and two are grassland species. The conservation status of some Tasmanian species will probably change as a result of new information gathered during the comprehensive regional assessment.

3.3.5 High-quality wilderness

Tasmania has extensive areas of wilderness, in the western half of the State. These areas have been relatively little disturbed by modern activities. Wilderness quality is diminished by activities such as forestry, mining and the associated infrastructure development (including roading, powerlines and pipelines). Sixteen areas of high-quality wilderness above the JANIS size threshold of 8000 hectares have been identified through the comprehensive regional assessment (see Table 3.7 and PLUC 1996e). Eighty-six per cent of the total area is already contained within the existing reserve system, 69.3 per cent of it being in dedicated reserves and 16.4 per cent in informal reserves. Among the areas of high-quality wilderness in informal reserves are Norfolk Range and Granite Tor in north-west Tasmania and the region south of Macquarie Harbour and to the west of the Tasmanian Wilderness World Heritage Area.



Table 3.7 High-quality wilderness reservation analysis

(hectares)

Wilderness area	Area in dedicated reserves	Area in informal reserves	Area on other public land	Area on private land	Total
Southwest	968 520	154 790	65 070	80	1 188 460
Cradle – Central Plateau	311 210	27 550	34 930	2 460	376 150
Norfolk Range	1 140	79 280	11 820	40	92 280
Meredith Range	1 270	13 890	48 290	0	63 450
Donaldson River	0	5 050	48 290	0	53 340
Savage River	0	32 170	19 420	0	51 590
Henty River	270	1 450	22 150	80	23 950
Mt Field	11 180	2 420	1 800	0	15 400
Sumac	9 240	1 590	3 260	0	14 090
Mt Heemskirk	0	30	10 840	0	10 870
Ben Lomond	9 810	10	470	10	10 300
Douglas-Apsley	10 000	0	60	0	10 060
Little Henty	320	420	8 310	10	9 060
Freycinet	8 460	0	0	0	8 460
Maria Island	8 450	0	0	0	8 450
Mt William	7 160	0	0	500	7 660
Total	1 347 030	318 650	274 710	3 180	1 943 570
Percentage	69.3	16.4	14.1	0.2	100

The total area of high-quality wilderness is 1 943 570 hectares; 42 per cent (823 810 hectares) of this is forest. The JANIS criterion recognises that, since forest and non-forest vegetation types form a mosaic, non-forest vegetation may be included in largely forested wilderness areas. At present 653 960 hectares (79.4 per cent) of forest in high-quality wilderness areas is in dedicated and informal reserves; the remainder is unreserved. One-fifth of 1 per cent (3180 hectares) of high-quality wilderness is on private land.

3.3.6 Reserve design

Reserve design can influence the protection of conservation values and the efficiency and effectiveness of subsequent management. Poor reserve design can mean that the attributes in a protected area may not be maintained over time. The JANIS principles for reserve design are as follows:

- Boundaries should be set in a landscape context with strong ecological integrity, such as catchments.

- Large reserved areas are preferable to small reserved areas, though a range of reserve sizes may be appropriate to adequately sample conservation values.
- Boundary–area ratios should be minimised and linear reserves should be avoided where possible except for riverine systems and corridors identified as having significant value for nature conservation.
- Reserves should be developed across the major environmental gradients if feasible, but only if these gradients incorporate key conservation attributes which should be incorporated in the CAR system.
- Each reserve should contribute to satisfying as many reserve criteria as possible.
- Reserve design should aim to minimise the impact of threatening processes, particularly from adjoining areas.
- Reserves should be linked through a variety of mechanisms, wherever practicable, across the landscape.

Some well-designed large reserves and a range of smaller reserves make up the current reserve system; Map CRA1.1 of the environment and heritage report (PLUC 1996e) shows the extent of the reserve system in Tasmania. The recent reserves arising from identification of Recommended Areas for Protection were designed to encompass the range of forest environmental domains.

A large proportion of the existing reserve system satisfies the JANIS reserve design principles. In particular, most of the recent additions to the system have, where possible, incorporated the principles. Some existing reserves do not satisfy the principles but may have important recreational and local-value reasons for reservation.

3.3.7 Protecting heritage values

National Estate values

A wide range of indicative National Estate values in Tasmania have been systematically examined as part of the comprehensive regional assessment; the results are described in the National Estate report (PLUC 1997c). Although there is no State statutory requirement, National Estate values are considered and, where possible, protected through a combination of Tasmania's planning systems and through the reserve system. Some National Estate values are, however, not well represented in the current reserve system. Table 3.8 shows the current reservation status of the indicative National Estate values identified in the National Estate report. About half the total area identified (4.4 million hectares) is within the current reserve system, and all but one of the 29 indicative National Estate values are represented in the current reserve system. The extent of reservation varies from zero (for remnant vegetation) to 96 per cent (for areas of significance for succession). Values with low reservation levels are faunal centres of endemism, faunal richness, fauna at the limits of their range, rare forest communities, remnant vegetation and representative wetland areas. All indicative National Estate values are represented on private land, comprising 18 per cent of the total area of indicative National Estate values identified.

There is some coincidence between National Estate biodiversity values and biodiversity values identified as potentially contributing to the comprehensive, adequate and representative reserve system.

A number of Acts provide for identification and management of cultural places in Tasmania, among them the *Forest Practices Act 1985* and the *National Parks and Wildlife Act 1970*. These Acts have offered protection for some cultural values, but they have lacked a comprehensive framework in which to



function. Proclamation of the *Historic Cultural Heritage Act 1995* has greatly improved the situation in relation to the identification and protection of cultural places; the Act also establishes the Tasmanian Heritage Council and the Tasmanian Heritage Register. A definition of 'place' and criteria that are considered compatible with National Estate criteria are used in the Act; this will facilitate the identification, assessment and conservation of cultural (non-indigenous) National Estate values. The Act should provide a broad framework for the conservation of cultural heritage and improve the consistency, standards and application of cultural conservation processes across a wide range of land management agencies. This, in turn, will make other relevant Acts more effective.



Table 3.8 Current reservation status of indicative National Estate values

(hectares)

Indicative National Estate value	Dedicated reserves	Informal reserves	Total area reserved	Area on other public land	Area on private land	Total area of value	% in current reserves
Aesthetics	156 547	47 482	204 029	47 166	7 924	259 119	79
Floral centres of endemism	284 861	13 992	318 966	34 105	25 218	378 289	84
Faunal centres of endemism	68 610	26 302	94 912	189 694	72 556	357 162	27
Disjunct flora	45 840	11 641	57 481	23 173	16 947	97 601	59
Disjunct fauna	15 689	8 076	23 765	10 882	13 661	48 308	49
Faunal richness	18 858	16 004	34 862	62 107	23 696	120 665	29
Floral limits	96 145	16 688	112 833	82 473	44 262	239 568	47
Floral richness	121 303	76 672	197 975	106 412	30 234	334 621	59
Geoheritage	1 858 828	420 361	2 279 189	786 478	374 988	3 440 655	66
Historic values	361	54	415	91	9	515	81
Key fauna habitat	372 962	182 249	555 211	641 558	555 930	1 752 699	32
Faunal limits	62 203	26 871	89 074	114 231	89 707	293 012	30
Research, teaching, reference sites	159 551	10 858	170 409	49 423	9 291	229 123	74
Faunal type localities	7	2	9	5	2	16	56
Floral type localities	27	4	31	6	5	42	74
Primitive and relictual fauna	193 402	141 797	335 199	68 249	58 679	462 127	73
Primitive and relictual flora	65 927	56 644	122 571	63 368	3 771	189 710	65
Rare communities	18 572	11 888	30 460	28 283	109 373	168 116	18
Refugia present	82 599	21 049	103 648	33 832	12 107	149 587	69
Refugia from past processes	61 439	67 407	128 846	87 084	2 443	218 373	59
Remnant vegetation	129	30	159	461	31 500	32 120	0
Representative vegetation	1 503 285	461 266	1 964 551	706 439	172 139	2 843 129	69
Representative wetland areas	2 580	1 633	4 213	17 994	2 189	24 396	17
Social values	102 549	44 345	146 894	36 906	8 620	192 420	76
Succession sites	39 845	4 578	44 423	1 392	675	46 490	96
Old-growth forest	428 076	155 467	583 543	246 667	18 631	848 842	69
Wilderness	1 347 030	318 650	1 665 680	274 710	3 180	1 943 570	86
Natural landscapes	1 467 940	420 337	1 888 277	608 943	40 643	2 537 863	74
Undisturbed catchments	1 004 302	252 408	1 256 710	120 865	94	1 377 669	91
Total	1 590 220	590 290	2 180 510	1 454 170	807 760	4 442 440	49

World Heritage values

The Tasmanian Wilderness World Heritage Area, listed in 1982 and extended in 1989, is one of the largest conservation reserves in Australia. At 1.38 million hectares, it covers about 20 per cent of the State. It meets all four natural heritage criteria and three of the cultural heritage criteria for World Heritage listing.

In order to fulfil its obligations under the World Heritage Convention, the Commonwealth Government reached agreement with the Tasmanian Government on joint management and financial arrangements for the Tasmanian Wilderness World Heritage Area. The agreement allows the Tasmanian Parks and Wildlife Services to manage the majority of the World Heritage Area under the auspices of a council of Commonwealth and State ministers and in close consultation with a community advisory committee.

Indigenous heritage values

Forests can have a range of values for Aboriginal people including archaeological, historical, spiritual and community values, as well as for direct use of their natural resources. There can often be a substantial difference in Aboriginal and non-Aboriginal views regarding values. For example, Aboriginal people place importance on the context of specific sites, not just on each site's immediate surroundings.

In 1995 the Tasmanian Parliament passed the *Aboriginal Lands Act 1995*, vesting 12 areas of public land in the Aboriginal Land Council of Tasmania. These areas of land are of historic or cultural significance to the Aboriginal community. The Tasmanian Government is committed to replacing the *Aboriginal Relics Act 1975* with legislation that reflects the Aboriginal community's views on cultural heritage. The Tasmanian Parks and Wildlife Service administers the current legislation and has established an Aboriginal Heritage Unit to work closely with the community on heritage assessment and management. The Forest Practices Board employs an archaeologist and an Aboriginal field officer to conduct field surveys and training and to participate in the development of timber-harvesting plans. In this context, the Expert Advisory Group on Ecologically Sustainable Forest Management noted that a post-harvest survey of coupes conducted by Forest Practices Officers and Aboriginal Heritage Officers is proving a successful means of increasing Forest Practices Officers' appreciation of Aboriginal sites and involving members of the Tasmanian Aboriginal community in the monitoring of forestry activities (PLUC 1997a).

3.4 Private forested land

The total private land area in Tasmania is 2 688 700 hectares; approximately 38 per cent of it is forested. Since 1985, private forest owners have been able to declare their forest as a private timber reserve. Some 270 000 hectares are declared as private timber reserves. Market forces largely determine the level of production on private land. Large industrial forest owners use their forests to supply both their own needs and the industry in general. Individual or non-industrial forest owners, dominated by landowners also involved in agricultural pursuits, use their forested estate as a source of capital and more recently as part of regular farm income.

Some 5300 hectares of private forested land are also dedicated as private conservation areas. Included in this area is 290 hectares of old-growth forest.

In Sections 3.3.1, 3.3.2 and 3.3.3 it is noted that for a number of forest communities, there is insufficient area on public land to meet the shortfall in the JANIS criteria. In summary, 17 forest communities (out of a total of 32 for which there is a shortfall), including 15 of the 16 rare, vulnerable and endangered forest communities, 16 old-growth forest communities (out of a total of 29 old-growth forest communities for which there is a shortfall) and all 11 of the rare and depleted old-growth forest communities cannot be adequately protected on public land. In addition, most poorly reserved endangered and threatened flora and fauna species occur on private land (see Map 3.3). All of the indicative National Estate values are represented on private forested land (see Table 3.8).

Governments have agreed that, as part of the Tasmania–Commonwealth Regional Forest Agreement, private forest owners participation in conservation arrangements will be voluntary (see Section 6.6). In recognition of the importance of private forests to both continued industry development and



conservation objectives, the Tasmanian Government established a Public Land Use Commission inquiry into possible management approaches to meeting conservation values on private forested land (see PLUC 1996c and 1997b).

In Tasmania, forest activity on private land is subject to a range of legislative and administrative requirements. The main mechanisms for protecting forest values on private land are the *Forest Practices Act 1985* and the Forest Practices Code. Harvesting of timber for commercial purposes requires the approval of a Timber-Harvesting Plan. Under the Interim Forest Agreement, however, the Tasmanian Government has used the timber-harvesting plan process to prevent further harvesting of under-represented communities that might be required in the comprehensive, adequate and representative forest reserve system. Administrative protection of conservation values where forest clearing is carried out for agricultural purposes is a matter for local government planning schemes.

3.5 Effective management systems and processes

The current reserve system and forest management systems and processes in Tasmania provide for the means to balance management of values by prescription and reservation.

In addition to identifying the range of environment and heritage values and reservation needs in Tasmanian forests, a number of studies commissioned as part of the comprehensive regional assessment recommended prescriptions and continuing management requirements for the protection of priority species or heritage values. The Expert Advisory Group on Ecologically Sustainable Forest Management made recommendations in relation to the capacity of Tasmania's management systems and processes to deliver sustainable outcomes across a range of values and uses (see PLUC 1997a). A number of these recommendations are directly relevant to the management of environment and heritage values.

3.5.1 Ecologically sustainable forest management

A range of systems and processes are currently used in Tasmania to achieve ecologically sustainable forest management. In its assessment of these systems and processes, the Expert Advisory Group concluded,

... the current Tasmanian environment management system meets many of the expectations of a system designed to achieve ecologically sustainable forest management.

At the district or equivalent level, the hierarchy and detail of planning and management are generally well developed, in a predominantly bottom-up approach in which modern technology, professional judgment, research and specialist skills are used to advantage.

There are, however, some deficiencies. Cost-effective approaches require action by the State, the Commonwealth in conjunction with the State, and by the Commonwealth in nationally coordinated programs. These relate mainly to higher levels of legislation (both Commonwealth and State), policy and planning; achieving more effective consideration of social values in forest planning; the need to monitor the outcomes of forest management so as to provide the basis for continuing improvement; and the need for greater interagency cooperation and coordination and a more strategic emphasis. (PLUC 1997a, p. x)

The Expert Advisory Group recommended a number of actions for redressing these deficiencies and improving on current strengths.

3.5.2 Protecting environment and heritage values by management prescription

Protection of environment and heritage values, both on and off reserve, may be delivered or improved through management prescriptions that seek to protect species and communities from adverse impacts.



The comprehensive regional assessment has provided information on disturbances and responses to disturbance for many Tasmanian forest species (see PLUC 1996e).

Some Tasmanian Codes and Acts—such as the Forest Practices Code and the *Threatened Species Protection Act 1995*—have provisions requiring conservation management of species or communities with a priority for conservation and (in the case of the Forest Practices Code) specifying techniques to avoid or minimise threats to important conservation values. Documents associated with the Code—such as the fauna manual, the threatened species manual, and the forest botany manuals—direct when forest management matters call for contact with specialists from the Forest Practices Unit or the Parks and Wildlife Service. This direction could be construed as a prescription in its own right. For current purposes, however, conservation strategies and prescriptions are considered to be those that come outside the normal requirements and directions of the Forest Practices Code and the Threatened Species Protection Act. An example is a prescription resulting from research into the ecology of a threatened species and that may be recommended after an occurrence of the species is notified to a specialist. To assess the effectiveness of existing management prescriptions, a database has been compiled to record conservation strategies recommended as a result of research or review. The database has been designed to show the degree to which recommendations have been translated into prescriptions and subsequently implemented, to identify deficiencies and any unifying prescriptions, and to provide a framework for incorporating new information as it becomes available.

4 Strategic issues

4.1 Background

Chapter 3 demonstrates that the current situation for resource supply and access and for the protection of environment and heritage values already contributes to meeting the objectives of the Tasmania–Commonwealth Regional Forest Agreement. The comprehensive regional assessment has provided the most complete information gathered to date on the conservation and use of Tasmania’s forests. This information has enabled the Tasmanian and Commonwealth Governments to identify more clearly issues that require attention to meet the objectives set out in Chapter 2.

This chapter highlights those issues that have been identified through analysis of the information gathered during the comprehensive regional assessment and through discussion of the current situation. Devising approaches to resolving these important strategic concerns is the greatest challenge to finalising the Tasmania–Commonwealth Regional Forest Agreement; this is the subject of Chapter 5. In their submissions to the Joint Steering Committee a number of individuals and groups also identified a wide range of matters for consideration in the development of the Agreement; these matters are summarised in Appendix C. The summary of submissions represents the views of groups or individuals making that submission. Where appropriate, indicative examples are also noted in this chapter. Appendix B lists the submissions received.

4.2 Social and economic issues

Issues can arise from the interaction between the need for resources and access to forested lands and the establishment of a comprehensive, adequate and representative forest reserve system. Other issues arise when forest industries or forest managers seek to pursue alternative development scenarios that require access to resources in areas of high environment and heritage value. This section discusses the principal social and economic considerations on which approaches to the Regional Forest Agreement can be based.

A range of comments were received by interested parties in relation to the RFA's environment and heritage objectives. While some of these are noted in the following sections, the full range of issues raised by stakeholders are summarised in Appendix C.

4.2.1 Managing for high-quality eucalypt hardwood supply from public land

Under the current management regime, if any of the provisional coupes from the Registers of Multiple Use Forest Land and Deferred Forest Land are not available in order to meet environment and heritage objectives there will be a reduction in the area of forest available for harvesting high-quality eucalypt hardwoods on public land. Any changes to the current forest-management regime or forest area can also alter the sustainable yield, although there may be some scope for substituting more intensive forest management to maintain sustained yield levels on a smaller area of available forest.

If all of the environment and heritage objectives were to be fully met important commercial forest communities for high-quality eucalypt sawlog and veneer supply would be adversely affected. Critical forest communities are *Eucalyptus regnans*, *E. delegatensis* wet, *E. delegatensis* dry, *E. obliqua* wet and *E. obliqua* dry. *E. regnans* is an important source of veneer logs, which are already in short supply. Some submissions noted a need to increase the sustainable yield (for example, the Forest Protection Society); others argued that the sustainable yield should be reduced or that the basis on which it is calculated should be reviewed (the Launceston Environment Centre, the Reedy Marsh Conservation Group, and N Smith). The question of current forest management and practices was also raised: some submissions called for selective logging rather than clear-felling (Tasmanian Country Sawmillers Ltd and the Mt Roland Landcare Group); others called for longer rotation periods (J Burgess and the Southern Forest Community Group). The Forest Industries Association of Tasmania and North Forest Products argued that there should be no further reservation of significant commercial forest communities.

4.2.2 Managing for special-species timber supply

In order to meet the Forests and Forest Industry Strategy supply levels for special species, access to all the provisional coupes on Deferred Forest Land and Multiple Use Forest Land containing special-species timber is necessary. The continuing supply of the supply levels of deep-red myrtle and sassafras is particularly dependent on access to sufficient areas of tall rainforest on basalt soils in north-west Tasmania. Many of these are within high-quality wilderness areas.

Blackwood on flats is another forest community that is a valuable source of special-species timber. The current reservation level for this community does not meet the JANIS criteria for forest communities. The availability of special-species timbers could be increased if some areas, outside provisional coupes, that have potential for commercial wood production were harvested. If this occurred, additional provisional coupes for special species on unreserved land would need to be identified, after consideration of factors such as volumes and species, roading costs and slope. They could possibly replace or supplement existing provisional coupes. Availability of special-species timbers could also be enhanced if new harvesting methods become feasible, for example helicopter logging.

Current management arrangements for mixed eucalypt forests—that is, managing for shorter rotation cycles and clear-felling of wet eucalypt forests—mean that there will be a reduced supply of special-species timbers from these forests in the long term and increased reliance on special-species timber management units.

The longer term sustainability of the Forests and Forest Industry Strategy's supply levels for rainforest species—for example, Huon pine—also warrants consideration.

In relation to preserving special-species timbers, the Launceston Environment Centre is of the view that the Forests and Forest Industry Strategy should be adopted with some amendments. The Forests and Forest Industry Council of Tasmania and the Construction, Forestry, Mining and Energy Union also consider that the Regional Forest Agreement should generally build on the management systems outlined in the Forests and Forest Industry Strategy. The Environmental Students Society considers that special-species timbers are not being managed on a long-term sustainable basis, a view supported by the Reedy Marsh Forest Conservation Group in connection with Huon pine. The Southern Forests Community Group commented that current eucalypt silvicultural practices in the southern forests will



lead to the eventual loss of celery-top pine and other special-species sawlogs in the area. It seeks changes to these practices.

4.2.3 Maximising the use of public forested land for thinning and plantation development

Four main considerations are associated with achieving the objective of maximising the use of public forested land for thinning and plantation development while ensuring that regional conservation and catchment management objectives are not compromised:

- the extent to which maximising the area of public land for thinning and plantation development can increase sustainable production of sawlogs and pulpwood or offset any reductions in sustained yield that may result from changes to the current resource base;
- the extent to which the increased wood resource requirements for prospective industry developments can be met;
- securing access to areas of public native forest with high potential for plantation development;
- the effects on the Regional Forest Agreement's environment and heritage objectives and the effects on regional conservation values and water catchments resulting from the conversion of areas of native forest to hardwood or softwood plantations.

A number of submissions discussed public native forests and plantations. Several opposed the conversion of native forests to plantations (the Tarkine National Coalition and G Warner) and argued that wood should be supplied from existing plantations or plantations established on agricultural land (the Reedy Marsh Forest Conservation Group, J Clark and the Tasmanian Conservation Trust (NW)). The Forest Industries Association of Tasmania argued that plantations are a resource additional to native forests and cannot replace native forest as a resource, a view supported by North Forest Products.

4.2.4 Managing for multiple use of forest areas

In the case of managing for multiple use, the main issue is ensuring that adequate consideration is given to meeting the full range of forest users' needs.

Nature-based tourism

Growth in nature-based tourism in Tasmania will depend on a range of factors—marketing, infrastructure development, maintenance of natural values, access, and so on. The Regional Forest Agreement could potentially contribute to positioning Tasmania's tourism industry to take advantage of projected growth in this section of the tourism market. The Agreement could sustain or enhance protection of the conservation values of forested land, so that Tasmania continues to be perceived as a 'clean, green' destination for tourists, while also allowing appropriate forested land to be managed in a way that permits development of the tourism infrastructure needed to cope with the expected increase in visitor numbers.

Multiple Use Forest

In Tasmania, many areas of Multiple Use Forest adjoin State reserves or other protected areas. A variety of forest users often rely concurrently on Multiple Use Forest and reserve tenures. Any reduction in area



or any rezoning of Multiple Use Forests to meet production and conservation goals will inevitably have some effects on forest users.

Road access

Roads are essential for many forest uses but are incompatible with others. The cost of roading in the absence of commercial forest operations is a concern; for example, apiarists need long-term access to the leatherwood resource but cannot finance the required roading infrastructure on their own. Although roading in mature forests provides access to additional leatherwood resources, beekeepers claim that the logging that accompanies such construction will result in a gradual net loss of the leatherwood resource. The leatherwood resource in the World Heritage Area is important for beekeepers because it is the only major source of nectar with long-term security. Planned road and track closures could restrict access to leatherwood.

The Traditional and Recreational Land Users Federation also supports the keeping open of roads in the World Heritage Area; the Reedy Marsh Forest Conservation Group considers, however, that roading in reserves should be legislated against.

The Tasmanian Trades and Labor Council argued that the non-commercial aspects of forests must be given adequate recognition, as should those industries dependent on the non-wood values of the forests. Recreational and other commercial users expect long-term repeated access to forested land for a variety of traditional and recreational pursuits; in addition, furniture designers, boat builders and those in the craft industry require continued availability of special-species timbers, as noted in the submissions received from G Smiley and the Southern Forests Community Group.

A number of other forest uses were also noted in the submissions, among them extraction of tree ferns, peat and moss, mineral exploration and mining, tourism, apiculture, firewood collection, walking and grazing.

The potential of nature-based tourism, in particular ecotourism, was noted in many submissions. Submissions argued that this issue warranted further attention in the Regional Forest Agreement (for example, T Cadman, E Short and Tourism Tasmania). There is an expectation that the RFA process will provide gains to the tourism industry in the form of security of those tourism attractions that provide the resource as well as access to those attractions. Specific areas for tourism potential were highlighted in several submissions; for example, the Great Western Tiers (the Native Forest Network), the Huon Valley (the Southern Forests Community Group) and the Meander Valley (Meander Valley Council).

4.2.5 Enhancing forest industry development

The future direction and expansion of Tasmania's forest industries depend not only on expected wood availability and perceived market opportunities but also on macro-economic factors such as exchange rates, interest rates, and overall demand for particular forest products and services. These macro-economic factors are beyond the scope of the Regional Forest Agreement. A range of micro-economic factors are similarly beyond the scope of the Agreement, among them the cost of energy, efficient transport systems to and from Tasmania, State and Commonwealth taxation, a well-trained workforce, and other factors that can affect the competitiveness of the forest industry.

Several matters that are critical to the growth and competitiveness of the forest industries can, however, be dealt with by the Regional Forest Agreement:

- the provision of certainty of access to forest resources on public and private land during the life of the Agreement;
- the development and location of wood resources, especially plantation resources, to provide internationally competitive mill-door log prices for the sawmilling and other value-adding industries;
- the development of a regulatory regime for forests that permits the forest industries to be internationally competitive while still delivering the desired environmental outcomes;



- the supply of high-quality resource, especially for the hardwood sawmilling sector as it seeks to increase its use of appearance-grade products and for the high-value veneer and special-species markets;
- the extent to which intensive management of public lands can be expanded;
- the scope to increase the area of private forest under active management for wood production, including expansion of plantation establishment.

The Margules Groome Pöyry study (1997) of the growth potential of Tasmania's forest industries identified a number of potential investment and employment opportunities: additional downstream processing of sawn timber and sliced veneer, integrated pulp and paper mills, peeled veneer and plywood, and medium-density fibreboard. These opportunities were identified on the basis of access to the current land base and the continuation of current silvicultural management on public and private land: expansion of this base would offer further opportunities. The Regional Forest Agreement cannot be prescriptive about the nature of industry expansion and investment, but the Margules Groome Pöyry study does provide the basis for an assessment of the opportunities that may be lost if the resource base is not available to pursue these or similar developments.

The need for resource security was noted in submissions (the National Association of Forest Industries Ltd, the Forests and Forest Industry Council of Tasmania and the Meander Valley Council). Others commented on the importance and potential of the veneer and special-species timber industries (the National Association of Forest Industries Ltd, the Forest Industries Association of Tasmania and N Smith). A number of submissions also claimed that more could be done to promote downstream processing (E Short, the Forest Protection Society, the Construction, Forestry, Mining and Energy Union, the Environmental Students Society and the Forest Industries Association of Tasmania).

4.2.6 Maintaining access for mineral exploration and mining

The principal issue in relation to mineral exploration and mining is maintenance of long-term, repeated access for four reasons:

- Maximum opportunities for future economic benefit can be realised only if access to areas of moderate to high mineral potential is maintained.
- The location of mineral deposits cannot be predicted with precision, so a number of exploration programs may be required to discover economic mineralisation in an area.
- Technical innovation, advances in knowledge, and changes in commodity prices and community needs will influence concepts of the prospective areas to explore.
- Exclusion from areas with moderate to high mineral resource has the potential to dampen industry confidence, limit exploration activity, and discourage continued investment.

Table 4.1 shows preliminary figures for the potential contribution to the economy of the minerals sector to 2020 if access to known deposits is maintained and if other commercial and broader economic circumstances are favourable. For illustrative purposes, discovery and development of a 20 million tonne Rosebery-type deposit is estimated to have a net present value of \$535 million and a gross in situ value of over \$5 billion.



Table 4.1 Potential contribution to the Tasmanian economy of mineral development based on resources on forest land, to 2020

Indicator	1996	2020
Gross State Product (\$/m/yr) ^a	9 762	+275
Employment (no. of jobs)	201 100	+3 050
Tasmanian export value (\$/m/yr) ^a	1 673	+419

a. In 1997 dollars.

Note: Figures are preliminary only.

Source: Centre for Regional Economic Analysis data—see Appendix E.

In Tasmania, areas of moderate to high mineral potential in Strategic Prospectivity Zones often coincide with areas of high-quality wilderness; for example, in western and north-western Tasmania (see Table 4.2, Map 3.1 and Appendix E). There are also known mineral deposits in north-western Tasmania that have the potential to offer associated manufacturing industry opportunities; these deposits either lie in high-quality wilderness areas or would need to have associated infrastructure in wilderness. Among them are the Savage River iron ore resource and deposits of dolomite and magnesite, ochre and umber. If existing reserves in areas of high-quality wilderness that are currently open to mineral exploration and mining were included in reserves to which access was denied, 217 517 hectares (or 6.7 per cent) of the total available area of moderate to high mineral resource potential would be withdrawn. A comparison of Maps 3.1 and 5.2 shows that this includes extensive areas of the highest-weighted composite mineral resource potential.

If all high-quality wilderness in Strategic Prospectivity Zones were made unavailable for mineral exploration, a total of 521 670 hectares of land with moderate to high mineral resource potential would be affected. Almost all of this land is in the western half of Tasmania, where 33.7 per cent of the area of moderate or higher potential would become unavailable for exploration. Under State law, this would have major implications in terms of compensation payments to the holders of mineral tenements. Another important issue is the need for management and environmental impact assessment regimes that allow the mineral exploration and mining industries to remain internationally competitive while at the same time delivering the desired environmental outcomes. The current State government requirements for taking this into account are outlined in the social and economic report (PLUC 1996f, vol. III). The question of access to areas for mineral exploration and mining was raised in several submissions. Sharples et al. argued that mineral exploration and mining should not be allowed in all areas of the State with high mineral potential and that reduced expenditure on mineral exploration and mining during the 1980s and 1990s was not necessarily the result of concern about additions to the reserve system. The Tasmanian Minerals Council argued that all current and future mineral exploration and mining in the Strategic Prospectivity Zones should be maintained, especially given that the zones have the weight of State legislation. The Tarkine National Coalition called for a regional mining agreement, presumably on the basis that the areas for mining would be clearly defined. It also called for the development of a code of practice for mining.

4.2.7 Ensuring social infrastructure and community viability

An important social issue concerns the need for the Regional Forest Agreement to provide the opportunity to ensure security of resource access that will facilitate investment in forest industries and result in increased employment opportunities, while at the same time securing environment and heritage outcomes that will maintain forest values over time.

A number of social concerns connected with the use and management of Tasmania's forests were identified during the social assessment and arise from the RFA objectives outlined in Box 2.3. These concerns vary for different individuals, groups and communities and according to geographic location. Although there has been community conflict over forest issues, a notable finding of the social values



survey conducted for the comprehensive regional assessment was that about 70 per cent of respondents believe that native forests should be protected and should also be used as a source of employment. Many forest industry employees live in small rural communities and hamlets across Tasmania. They have often lived in the area for a long time and have established strong familial ties and social networks within their respective localities. Strong feelings of attachment to both physical place and community are evident.



Table 4.2 Mineral resource potential of areas outside dedicated reserves and in high-quality wilderness

Wilderness area	Mineral resource potential
Douglas-Apsley	All national park but contains areas of high potential, including the Dalmayne and part of the Douglas River coal fields
Ben Lomond	Area outside the National Park boundary on the eastern side contains zones of high and high-moderate potential
Mt William	Area west of the National Park contains areas of high and high-moderate potential
Slivers east of Central Plateau Conservation Area	Four areas contain zones of unknown potential
Clarence	Partly unknown potential
Derwent, Wylds, Mt Field, Mt Styx, Snowy Range	No significant potential
Weld River, Huon, Picton, Hartz, Warra	Some areas of high, high-moderate, moderate and unknown potential
Esperance	One small patch of moderate potential
Lune River, South East Cape and patch between	High, high-moderate and moderate potential
Melaleuca Inlet – Cox Bight	High-moderate potential, part currently being mined for tin
Adamsfield	Mostly high potential
Southwest Conservation Area	High, high-moderate, moderate and unknown potential
Teepookana and surrounding large area north of Macquarie Harbour and west of the World Heritage Area	Most high, some moderate potential
Lake Burbury area	Moderate potential
Eldon and Tyndall Ranges	High and moderate potential
Granite Tor – Vale of Belvoir area	Most high, small areas of high-moderate and moderate potential
Slivers around Great Western Tiers	High and moderate potential
Upper Forth Valley	High potential
Henty, Little Henty	High, high-moderate, moderate and unknown potential
Mt Heemskirk	High potential
Pieman, Meredith Range, Huskisson, Donaldson	High and high-moderate potential
Coldstream	High, moderate and unknown potential
Savage	High, high-moderate, moderate and unknown potential
Thornton	High potential
Norfolk Range, Sumac	Mostly high potential, four small areas of moderate potential



Another issue is that the uncertainty associated with changes in forest activity, particularly in communities with a high level of dependence on the forest industry, has the potential to damage community cohesion and vitality. The social values survey revealed that people living in north-eastern, north-western and central Tasmania are more likely to have family members employed in forest industries and that it is north-eastern and central Tasmania that have the highest level of perceived dependence on the forest industry (see PLUC 1996f, vol. III).

Many forest industry employees are young couples or have young families and are relatively more reliant on community infrastructure services such as education, health and recreation. Changes in employment affecting these groups have the potential to adversely affect—in some cases quite severely—the continued availability of these community services in rural areas.

The indirect effects associated with forest industries may also be relatively high. Forest-related industries often spend money locally and regionally on various goods and services. And forest industry employees spend money on goods and services in their particular township; these employees are often members of various community groups and associations and often contribute significantly to community activities. From a social perspective, the main factor that needs to be recognised in developing appropriate approaches for a Regional Forest Agreement is that social systems are complex and interrelated and that effects on one group can result in effects on many.

A number of points were made in this regard in the submissions. N Smith, for example, argued that options for alternative community structures and employment opportunities should be examined, particularly in relation to the continuing restructuring of the forest industry. The Forest Protection Society argued that the impact on local infrastructure such as schools and community services should be considered and that community vitality should be enhanced through the provision of an appropriate level of infrastructure. The question of balance between reservation and working forests was also raised by the Forest Protection Society, which considers that in determining such a balance the level of dependence on the forest industry and the likely effects of forest use must be taken into account.

4.3 Environment and heritage issues

Issues can arise from the interaction between a comprehensive, adequate and representative reserve system in accordance with the JANIS criteria and society's need for resources and access to forested lands. Application of the reserve criteria, including the flexibility provisions are summarised in Box 2.1. This section deals with biodiversity, old-growth and wilderness values. Some values are found in the same areas, so the protection shortfalls identified are not additive. The establishment of a comprehensive, adequate and representative reserve system in accordance with the JANIS criteria will require that some areas of land are not developed for resource use and are maintained for conservation purposes. In other cases, areas developed will need to be managed differently.

A total area of about 278 000 hectares would need to be protected to meet the general JANIS criteria for forest communities and old-growth, without taking reserve design, wilderness or species into account. Nor does this take account of other factors, such as the extent of forest communities, their uniformity, or their resilience and stability, which could justify lower levels of reservation. Most of this area occurs outside provisional coupes. Significant areas occur only on private land. As noted in Section 2.2, the Tasmanian and Commonwealth Governments are committed to meeting comprehensive, adequate and representative reserve system needs on public land in the first instance.

If some areas of land are not available to meet industry needs there will be a reduction in environment and heritage values.

A range of comments were received by interested parties in relation to the RFA's environment and heritage objectives. While some of these are noted in the following sections, the full range of issues raised by stakeholders are summarised in Appendix C.

4.3.1 Protecting representative samples of forest biodiversity

Adequate protection of biodiversity is necessary to ensure the long-term persistence of viable species and communities.



Forest communities

Further areas are required to ensure there is adequate protection, which would be prejudiced if values are lost to resource development. Thirty-two of the 50 forest communities mapped in Tasmania as part of the comprehensive regional assessment are reserved to a level below the JANIS reservation criteria (see Table 3.2).

Public land could make good 125 030 hectares of the 215 510-hectare shortfall but 90 480 hectares would have to come from private land—varying from 20 hectares of Furneaux *Eucalyptus viminalis* forest to 32 230 hectares of grassy *E. viminalis* forest.

Five forest communities of major commercial value do not meet the JANIS biodiversity criteria:

- *Acacia melanoxylon* on flats—a 1450-hectare shortfall;
- *Eucalyptus obliqua* dry forest—an 1820-hectare shortfall;
- *E. obliqua* wet forest—a 14 960-hectare shortfall;
- *E. regnans* forest—a 1600-hectare shortfall;
- *E. viminalis* – *E. ovata* – *E. amygdalina* – *E. obliqua* damp sclerophyll forest—a 6850-hectare shortfall.

A number of submissions commented on the level of and flexibility in applying the JANIS criterion for biodiversity (the Forests and Forest Industry Council, the Forest Industries Association of Tasmania, N Smith, the Tasmanian Conservation Trust (NW), the Forest Protection Society, North Forest Products, the Construction, Forestry, Mining and Energy Union, C Mitchell, the National Association of Forest Industries and the Launceston Environment Centre).

Other elements of forest biodiversity

The JANIS criteria seeks representation within the comprehensive, adequate and representative reserve system of all biodiversity elements and the variety within communities as they are spread across the landscape. This representation across the landscape provides a greater assurance that the full complement of biodiversity values is being adequately protected.

Protection of the 50 broad forest communities and protection of species, wilderness and old-growth forest may result in adequate representation of most elements of biodiversity. But, this needs to be assessed. Among the assessment techniques that can be used are IBRA, environmental domain analysis and assemblage domain models (see Appendix E). For example, in order to ensure representation across the landscape, protection should occur across IBRA regions, in particular in those regions where forest communities are less well protected. For some communities, adequate protection of representative samples of forest biodiversity could involve private land.

Some stakeholders have argued for exceeding the JANIS criteria across each IBRA region; others have argued against this. The Forest Protection Society noted the need to consider the impact of reserve design not only at the regional level but also at the local and national levels. Several submissions argued that the IBRA regions should be used as the basis for analysis of the JANIS criteria (the Launceston Environment Centre, the Tasmanian Conservation Trust and the Reedy Marsh Forest Conservation Group). The Launceston Environment Centre noted that there was also a need to consider the viability of forest communities, flora, fauna and their genotypes.

4.3.2 Protecting rare, vulnerable and endangered forest ecosystem biodiversity

Table 3.3 shows that 16 rare, vulnerable or endangered forest communities do not meet the JANIS criteria and that the total shortfall is 81 490 hectares.⁴ Of this area, only 24 400 hectares could come from public land; the remainder can come only from private land. Specifically, the shortfall for one of

⁴ The total shortfall of 215 510 hectares identified in Section 4.3.1 includes the shortfall for rare, vulnerable or endangered forest biodiversity.



the communities (*Callitris rhomboidea*) could be made good from public land, 12 communities would require additional protection on both public and private land, and the shortfall for two communities (*Eucalyptus morrisbyi* forest and *Banksia serrata* woodland) could be made good only from private land.

None of the 16 communities for which there are shortfalls is considered to be of high wood-production value but some contain quantities of pulpwood.

4.3.3 Protecting old-growth forest

The long-term protection of old-growth forest is important because of its very high aesthetic, cultural and nature conservation values and the relative absence of disturbances. Twenty-nine forest communities do not meet the JANIS criteria for protecting old-growth forest; the total shortfall is 149 710 hectares (see Table 3.4).⁵ Public land could make good 127 820 hectares of this shortfall; 21 890 hectares would have to come from private land.

For some forest communities, there is a high coincidence between the areas that would be required to meet the JANIS old-growth criteria and the areas of high-value production forest. There are shortfalls in meeting the JANIS old-growth criteria for seven forest communities of major commercial significance:

- *Eucalyptus delegatensis* dry forest—a 7790-hectare shortfall;
- *E. delegatensis* wet forest—an 11 800-hectare shortfall;
- *E. obliqua* dry forest—a 9060-hectare shortfall;
- *E. obliqua* wet forest—a 21 170-hectare shortfall;
- *E. regnans* forest—a 3080-hectare shortfall;
- *E. viminalis* – *E. ovata* – *E. amygdalina* – *E. obliqua* damp sclerophyll forest—an 1800-hectare shortfall;
- tall rainforest—a 16 510-hectare shortfall.

A number of submissions raised methodological questions about the assessment of old growth (for example, the Launceston Environment Centre, the Forest Protection Society, the Reedy Marsh Forest Conservation Group, the Tarkine National Coalition and the Forest Industries Association of Tasmania). Tengenowa Dreaming submitted that all old growth should be reserved until its Aboriginal values can be assessed; other submissions stressed the need for flexibility in applying the criterion (the Construction, Forestry, Mining and Energy Union, C Mitchell and the National Association of Forest Industries) and the need to recognise the dynamics of old growth (C Mitchell and the Forest Protection Society).

4.3.4 Protecting the area of high-quality habitat for biodiversity

Much high-quality habitat for biodiversity is already reserved and more would be reserved incidentally as a result of any additional reservation of wilderness and forest communities. As a complementary process, high-quality habitat has been defined for priority fauna and flora species. The protection of high-quality habitat requires a mixture of reservation and on and off reserve management. The focus has been to identify what species require in order to minimise the risk of extinction. The protection of high-quality habitat for priority species is an important element of the Commonwealth's statutory requirement to ensure completion of recovery plans for Tasmania's endangered and vulnerable species during the life

⁵ The total shortfall of 215 510 hectares identified in Section 4.3.1 includes some of the shortfall for old-growth forest.



of the Regional Forest Agreement. Some of the indicative National Estate areas are important indicators of areas of high-quality habitat. These include refugial areas and centres of endemism.

The Regional Forest Agreement will include a process for the preparation and implementation of recovery plans for the 13 endangered species and 24 vulnerable species.

Many priority species are found largely or wholly on private property.

Several submissions argued that not all the vulnerable, rare or endangered species have been considered for the Regional Forest Agreement and that further studies are necessary (the Tasmanian Conservation Trust, the Reedy Marsh Forest Conservation Group and the Tarkine National Coalition). Others noted that if protection of such species were required on private land adequate compensation or some other form of inducement was needed for the landowners involved (the Construction, Forestry, Mining and Energy Union, the Forest Industries Association of Tasmania and the Tasmanian Country Sawmillers Federation Ltd).

4.3.5 Protecting high-quality wilderness

As with old-growth forest, the long-term protection of high-quality wilderness is important because of its aesthetic, cultural and nature conservation values and the absence of disturbance. The shortfall in reaching 90 per cent reservation of high-quality wilderness, in keeping with the JANIS criteria, is 83 570 hectares. All the shortfall could be made good on public land.

In seeking to make good this shortfall, some choice is possible between largely forested and largely non-forested land with high-quality wilderness value. The JANIS criteria recognise that, since forest and non-forest vegetation types form a mosaic, non-forest vegetation may be included in largely forested wilderness areas.

Most areas of high-quality wilderness that are currently in informal reserves or outside reserves have also been identified as having moderate to high mineral resource potential and are in Strategic Prospectivity Zones (see Table 4.2). The 16.4 per cent of wilderness currently in informal reserves is not available for forestry but is available for mineral exploration and mining and other specific developments. The main issue concerns the interaction between the maintenance of wilderness values and other values and the effect of access and resource development on those values.

Some unreserved areas with high-quality wilderness value coincide with areas of high wood value; this is particularly the case for some special-species timbers and high-quality eucalypt sawlogs. For example, in the southern forests there are unreserved high-quality wilderness areas that contain tall wet eucalypt forests.

Submissions made a variety of comments on the wilderness methodology (for example, the Tarkine National Coalition, the Great Western Tiers National Park Campaign and the Launceston Environment Centre). The application of the JANIS criteria was also the subject of a range of comments. The Tasmanian Conservation Trust argued that 100 per cent of existing wilderness should be reserved. Others considered that there should be no further areas of wilderness reserved because Tasmania is already well endowed with wilderness (C Mitchell) and the costs of creating further wilderness areas would be high compared with the derived benefits (the Tasmanian Minerals Council Limited). North Forest Products argued that the wilderness criterion should be applied to private land only on a voluntary basis.

The Forest Industries Association of Tasmania considers that high-quality wilderness areas should remain available for both mining and timber production; that is, conservation and industry can co-exist. This view is not supported by E Short or the Tasmanian Conservation Trust (NW).

4.3.6 Maximising protection of conservation values through reserve design

Sound reserve design is important for maintaining the values being protected. Any proposed changes and additions to the reserve system should take the JANIS principles for reserve design into account and, where possible and appropriate, improve existing design.

The Regional Forest Agreement offers the opportunity to apply reserve design principles across the entire State and to take all environment and heritage values into account simultaneously in the context of the existing reserve system. This would have a number of benefits. Reserves could be designed to complement each other: this tends to be more efficient and reduces the economic impact of reserving



environment and heritage values. In addition, a regional approach can ensure that reserve design fully complements management systems and management prescriptions, thus leading to greater certainty of conservation outcomes as well as effective and efficient use of resources.

Applying the principles for reserve design to protect identified conservation values may result in some other forest communities being included in reserves beyond the relevant JANIS criteria. This becomes an issue if any additional areas have significant commercial value. Further, full application of the principles may be difficult because of the presence of resource and conservation values in adjoining areas. For example, small areas of importance for biodiversity may occur within a mosaic of plantations, private land and other production forests.

In fragmented landscapes, remnants that contribute to sampling the full range of biodiversity are vital parts of a comprehensive, adequate and representative reserve system. But, in designing additions to the reserve system, the implications for continuing management costs must also be considered. For example, many small scattered reserves cost more per hectare to manage than fewer larger reserves. Several of the forest communities—such as *Notelaea ligustrina* and *Eucalyptus pauciflora* on sediments—only occur in small isolated patches across the landscape.

Poor reserve design can result in values not persisting over time and the reserve system not adequately representing the full range of conservation values.

A number of submissions discussed reserve design. Three outlined models for identifying land for the comprehensive, adequate and representative reserve system (the Forest Protection Society, the Tasmanian Conservation Trust and the Traditional and Recreational Land Users Federation). Many submissions identified specific areas of land that should become part of the reserve system (see Appendix C).

In relation to whether additional reserves are required, the submissions varied greatly. On one hand, it was considered that there was no need for additional reserves in aggregate (the Forest Protection Society); on the other hand, there were calls to identify opportunities for protecting additional areas (for example, the Tasmanian Conservation Trust).

The question of reserve size also received comment. The Launceston Environment Centre, for example, argued that reserve size affects the viability of the continuation of species; it would support recommendations providing for an extensive reserve system. It also argued that there was a need to replicate reserves.

Some submissions commented that in designing reserves consideration should be given to providing buffer zones around reserves containing high conservation value (W Healey, the Reedy Marsh Forest Conservation Group, the Tarkine National Coalition and the Launceston Environment Centre). Others argued that buffers should be built into reserve design (for example, the Forest Protection Society).

The cost of the reserve system was also the subject of comment. Some considered that the nature and management of reserves should be built in at the design stage. This would mean that if an area could not be managed for the reservation objectives because of insufficient resources it should not be reserved (the Forest Protection Society). The Construction, Forestry, Mining and Energy Union suggested that some reserves be designated ‘working reserves’ that return an income to assist in management and that the principle of least cost be applied in relation to reserves and off-reserve management. The least-cost approach was also supported by the Forests and Forest Industry Council of Tasmania and the Tasmanian Trades and Labor Council. The Construction, Forestry, Mining and Energy Union suggested that long-term funding for the management of reserves should be legislated for.

4.3.7 Protecting heritage values

National Estate values

The values identified in the National Estate report (PLUC 1997c) are indicative only. The Australian Heritage Commission will determine which of the places associated with these indicative values are of National Estate significance. The key issue is the degree to which National Estate values will be maintained during the life of the Regional Forest Agreement. Some indicative values will be adversely affected by management for economic objectives.

There are four main issues in relation to protection of National Estate values:



- the extent to which National Estate natural and cultural values and places can be protected within the comprehensive, adequate and representative reserve system;
- the extent to which National Estate natural and cultural values and places need to be and can be satisfactorily protected outside reserves;
- ensuring that appropriate mechanisms exist to provide for off-reserve protection;
- the resilience of some National Estate values to different land uses.

National Estate values can be broadly placed into four groups:

- category 1—values that are generally resilient to forestry activities (such as timber-harvesting operations, controlled burning and roading) covered by the Regional Forest Agreement;
- category 2—values that are sensitive to timber harvesting, are similar or equivalent to a JANIS criterion value and, in the context of Tasmania as a whole, are likely to be adequately protected in the comprehensive, adequate and representative forest reserve system established under the Regional Forest Agreement;
- category 3—values that are sensitive to timber harvesting but are managed in accordance with the Forest Practices Code or prescriptions directed at ensuring the maintenance of these values (for example, endangered species for which recovery plans or action statements provide management prescriptions that are incorporated in forest management, or cultural landscapes for which management prescriptions have been established);
- category 4—values that are sensitive to timber harvesting but, because of the nature of the value or current forest management practices, are excluded from areas to be harvested (at least on public lands).

This categorisation allows for refinement of the measures designed to ensure adequate protection of each value. Among these measures might be protection in reserves, forms of prescriptive management, exclusion of sites from development proposals, voluntary agreements on private land or, in the case of resilient values, passive management.

Forestry operations are exempt from the *Historic Cultural Heritage Act 1996*, but heritage values are covered under the Forest Practices Code. This exemption means that the Regional Forest Agreement may not provide certainty of protection of National Estate cultural values, where the mechanism for protecting those values is the Code. To provide certainty, the Australian Heritage Commission would need to advise on mechanisms for management of National Estate cultural heritage values affected by the Forest Practices Code.

Stakeholders expect that the Regional Forest Agreement will resolve National Estate concerns connected with native forest. For the assessment of National Estate values some groups considered either that the consultations were not extensive enough or that the cultural values were not completely assessed (the Great Western Tiers National Park Campaign and the Traditional and Recreational Land Users Federation). The Tasmanian Country Sawmillers Federation Ltd argued that Commonwealth responsibilities for National Estate should be subsumed by the Regional Forest Agreement.



World Heritage values

An important issue for the Regional Forest Agreement is identification, assessment and protection of World Heritage values in forested areas in Tasmania. Attachment 1(f) of the Scoping Agreement states that both Governments agree to undertake jointly an assessment of World Heritage values in the forested areas of Tasmania to allow the Commonwealth to meet its obligations arising both from it being a state party to the World Heritage Convention and from its own statutory requirements as set out in the *World Heritage Properties Conservation Act 1983*.

A World Heritage expert panel has been convened and has identified places in Tasmania that warrant further investigation to assess their potential World Heritage values. Themes identified by the Panel as possibly being expressed in places in Tasmania are fossil sites, relict areas of biota, rainforest, eucalypt-dominated vegetation, evidence of the persistence of hunter-gatherer societies, and expansion of European society in the nineteenth century.

Many of the identified places either are in the existing World Heritage Area or are protected under various reserve classifications. Some of the places—in particular those potentially containing cultural values of World Heritage significance—are not necessarily found in forested areas.

The Commonwealth and Tasmanian Governments will agree on the process to address World Heritage issues as part of the Regional Forest Agreement.

A number of submissions commented on World Heritage. Comments ranged from proposals to extend World Heritage areas (the Great Western Tiers National Park Campaign and the Southern Forests Community Group), to the need to provide buffer zones around such areas (W Healey) and the need for existing roads in World Heritage areas to remain open (the Traditional and Recreational Land Users Federation). Others questioned how World Heritage values were going to be incorporated in the RFA process (Peak Environmental Enterprises and Conservation Centre of Australia and the Tasmanian Conservation Trust).

Indigenous values

Three important issues concern the Aboriginal community in Tasmania:

- identification and protection of Aboriginal values in forested areas;
- taking account of Aboriginal perspectives on and concerns about forest management;
- Aboriginal community involvement in developing the principles and processes for ecologically sustainable forest management.

Aboriginal values in forested areas are wide ranging; they include social and economic values, areas of historic and traditional significance, and aesthetic and scientific values. They encompass landscapes, which include tangible and intangible elements relating to significant stories and places, as well as specific sites.

4.4 Private forested land

Private forested land is an integral contributor to long-term wood supply, the maintenance of rural income, and the protection of conservation values. The continued availability of the wood resource on private land is important for industry development. The private forest estate contains diverse forest communities not found on public land, many rare and threatened species, and a number of remnant forest communities. Historically, clearing of forests has resulted in a number of communities and species becoming rare, endangered or extinct.

An important issue for the Regional Forest Agreement is recognising the resource and conservation values of private forested land. Knowing these values increases the likelihood of the retention and management of forests. Private forest owners who appreciate these values are keen to manage their forests to produce long-term sustainable benefits from their use for wood supply and for conservation.



Section 4.3 shows, for a range of forest community and old-growth forest values found on private land, a shortfall of around 98 000 hectares. Cooperatively involving landholders in developing options for conservation on private land is therefore critically important. Consultations with private forest owners have resulted in the owners having a good understanding of what type of forest is required and being committed to working cooperatively to resolve these issues. Private forest owners recognise that managing their estate for wood production and conservation can produce long-term sustainable return. The extent and type of protection on private forested land will be affected by the voluntary nature of any mechanisms established by governments and by the resources made available by the Commonwealth in accordance with clause 14(d) of the Scoping Agreement.

A number of submissions stressed the need for compensation or some other form of inducement for private landowners involved in stewardship (the Construction, Forestry, Mining and Energy Union, the Forest Industries Association of Tasmania, the Forest Protection Society and the Tasmanian Country Sawmillers Federation Ltd). Specific areas of private land were identified for possible inclusion in the comprehensive, adequate and representative reserve system (the Break O'Day Umbrella Ratepayers and Residents Association and JM Henley). In relation to private land required for the comprehensive, adequate and representative system, the National Association of Forest Industries argued that the appropriate process should be implemented within two to three years of the signing of the Regional Forest Agreement.

4.5 Effective management systems and processes

Successful management of the many values and products found in Tasmania's forests requires effective management systems and processes.

4.5.1 Ecologically sustainable forest management

Many of the structures and processes required to deliver ecologically sustainable forest management in Tasmania already exist. The Expert Advisory Group on Ecologically Sustainable Forest Management made 68 recommendations to the Joint Steering Committee to strengthen components of existing systems and to fill a number of gaps in those systems (see PLUC 1997a). Among them are proposals for legislative change, interagency policy integration and review, additional planning and public consultation, increased training and skills acquisition, comprehensive upgrading of compliance mechanisms, and monitoring and review of existing systems.

The costs of implementing all the recommendations is likely to be a significant additional consideration for governments.

4.5.2 Protecting environment and heritage values by management prescription

Several of the comprehensive regional assessment projects led to specific management recommendations. Some of these recommendations overlap with those of the Expert Advisory Group on Ecologically Sustainable Forest Management; these will need to be considered when finalising governments' approach to ecologically sustainable forest management.

The following are the key issues for protecting environment and heritage values by management prescription:

- ensuring that new management prescriptions are incorporated in current forest management arrangements (including amendments to current prescriptions and management arrangements where required);
- determining off-reserve management's potential contribution to the comprehensive, adequate and representative reserve system;



- ensuring that the Regional Forest Agreement includes effective processes for monitoring and reporting the outcomes of management prescriptions as a means of maintaining long-term security of conservation values.

4.5.3 Community involvement in forest management

Aboriginal people and traditional and recreational users of forests have special interests in the management of and access to forests. Active involvement in forest management and planning is a concern for these groups.

The Expert Advisory Group on Ecologically Sustainable Forest Management considered the extent of public involvement in decision making related to management and zoning of forests (see PLUC 1997a). A number of the Group's final recommendations relate to the need for improved public information on forest management arrangements and decision-making processes and greater transparency of opportunities for involvement.

Tasmanian forests contain many places and values of traditional and current importance to Aboriginal people. Protection of these places and values is of central significance to Aboriginal people, who have expressed a strong interest in participating more fully in the continuing management of those places and values. Aboriginal people have also expressed an interest in gaining access to forest resources for such economic initiatives as cultural tourism. A consultation process is in progress to identify, among other things, the specific nature of Aboriginal involvement in forest management. The consultations are being structured around a questionnaire and the result will be a report on specific indigenous concerns and approaches for the Regional Forest Agreement. It is anticipated that the development of heritage principles for the proposed Tasmanian Aboriginal Heritage Bill will begin while the Regional Forest Agreement is being formulated and will continue after the Agreement is signed.

The community in general has used Tasmanian forests for a variety of purposes, from picnicking, birdwatching and bushwalking to firewood collecting, hunting, fishing and four-wheel driving. Interest in some of these activities has been passed on from generation to generation. The forests provide the setting, the meaning and the resource for these activities.

The Deloraine Aboriginal Cultural Association stressed the importance of land management to the Aboriginal community. The Tengenowa Dreaming submission sought compensation to the Aboriginal community for loss of both natural and cultural values in forests; as noted, it also urged that old growth be reserved until its Aboriginal values have been assessed.

The importance of public involvement in forest-management decision making was stressed in several submissions. The Traditional and Recreational Land Users Federation argued that the Regional Forest Agreement should provide for greater participation by local communities in the conservation and management of local areas of public land. The Forest Protection Society is of the view that people who work in the forests should be actively involved in forest management.

5 Approaches to strategic issues

5.1 Introduction

To be durable, a regional forest agreement must achieve a balanced outcome that best meets all the objectives being used as the framework for the integration process. In seeking to achieve this balanced



outcome, governments recognise the difficulties associated with meeting all of the objectives at the same time.

The Joint Steering Committee has developed four approaches to identifying the most practicable and acceptable combination of circumstances to achieve a balanced outcome. Each approach considers potential contributions to and possible consequences for the RFA objectives (see Box 2.3). The approaches are not mutually exclusive and should not be regarded as discrete options: components of the different approaches could be combined or configured in other ways to provide agreed outcomes for the Regional Forest Agreement.

The first approach—‘current opportunities’—is based on current resource supply and management. It adopts the Margules Groome Pöyry (1997) estimation of forest industry development potential and seeks to make a substantial contribution to the environment and heritage objectives by protecting areas of public land outside provisional coupes.

The second approach—‘enhanced forest industry opportunities’—builds on the ‘current opportunities’ approach by exploring the contributions and consequences of intensifying forest management on public lands through additional thinning of native forest and plantation establishment.

The third approach—‘enhanced protection of old-growth forest and biodiversity’—builds on the ‘current opportunities’ approach by further enhancing conservation objectives on public land while minimising adverse effects on wood production.

The fourth approach—‘enhanced wilderness protection’—builds on the ‘current opportunities’ approach by protecting all high-quality wilderness areas.

This chapter also discusses three considerations that apply to all four approaches: reserve design; private property; and access and management.

Two sub-regional case studies have been developed to demonstrate the potential implications of designing reserves consistent with the JANIS principles.

Private forested land offers significant opportunities for meeting social and economic objectives. In addition, a number of environment and heritage objectives can be fully met only through contributions from forest communities and species on private forested land. Matters associated with private land are discussed under each approach and also in relation to reserve design.

Access and management arrangements for other forest uses, including mineral exploration and mining, recreation, tourism, apiculture, and for Aboriginal people will be considered when the Regional Forest Agreement is being finalised. As Chapter 4 shows, these arrangements can have potentially significant consequences for forest uses, particularly for mineral exploration and mining. They will be elaborated on in the discussion of approaches in this chapter.

5.2 The ‘current opportunities’ approach

The ‘current opportunities’ approach is based on the current area of public and private land available for wood production, the Forests and Forest Industry Strategy (including access to current Deferred Forest), and continuation of the projected current rate of thinning and plantation establishment on public land. It adopts the Margules Groome Pöyry (1997) estimation of industry development potential (see Box 5.1). The analysis is based on current access and management arrangements for mineral exploration and mining, tourism, recreation and other forest uses. Although the approach does not take reserve design into account, it seeks to make a substantial contribution to those environment and heritage objectives that can be met outside provisional coupes. The contribution private forested land could make to environment and heritage objectives is not considered.

The Margules Groome Pöyry study provides an estimation of forest industry growth by the year 2020. The probable commencement and viability of projects will be influenced by a range of factors, including commercial considerations such as potential returns to shareholders.



This approach also explores the potential contributions and consequences of adding to the reserve system areas of public land outside provisional coupes.

The total area of unreserved public land outside provisional coupes is 538 500 hectares, of which 429 500 hectares is forest. This area could contribute to meeting the environment and heritage objectives on public land. Map 5.1 shows the area of public land outside provisional coupes that contains forest community and old-growth values currently reserved at levels below the JANIS criteria.

Box 5.1 The Margules Groome Pöyry assessment of Tasmanian forest industry growth potential to 2010 and 2020

The Australian Bureau of Agricultural and Resource Economics, assisted by Tasmania Development and Resources, engaged Margules Groome Pöyry to identify the growth potential for the Tasmanian native forest industry, as illustrated by long-term scenarios to 2010 and 2020. These scenarios were based on assumptions about hardwood resource supply, wood-based product competitiveness and potential markets, and industry development options (including solid wood products, reconstituted panels, and pulp and paper products).

Resource

Resource assessment and forecasts of development are for the eucalypt from native forests and plantations and include both public and private land. It is assumed that the current volume and quality of resource will be available in 2010 and 2020, together with such eucalypt plantations as are currently planned.

Competitiveness and markets

The potential future structure of the industry assumes the following by 2010:

- There is a free competitive investment environment in Tasmania for energy, transport and government charges.
- There is long-term security of wood supply, to enable industry to make large-scale investments in processing and in plantation programs.
- Industry developments with good market prospects and competitive strength can be implemented in the medium to long term.

The study identified marketing opportunities, for both appearance- and structural-type eucalypt sawn timber, in export substitution. The primary focus will, however, be in markets for appearance-grade sawn wood. Within the Asia-Pacific region, demand for medium-density fibreboard and particleboard is strong and is predicted to continue in the medium term. The market review also indicates good demand-growth prospects in the Asia-Pacific markets and large import substitution possibilities in the Australian markets in the printing and writing paper sector.

Industry development options

The following development options and strategies for the Tasmanian forest industry were identified:

- sawn wood and veneer and plywood processing and adjustment of operations to use the increasing supply of regrowth eucalypt sawlogs;
- expansion of reconstituted panel (medium-density fibreboard) production;
- expansion of printing paper production, both in the wood-free printing and writing paper sector (based on chemical pulp) and in the mechanical printing paper sector (based partly on mechanical pulp);
- chip exports.

Source: Margules Groome Pöyry (1997).

The 'current opportunities' approach does not give priority to consideration of forested and non-forested wilderness and does not consider the question of largely forested wilderness. The area of additional forest is shown in Table 5.4. Map 5.2 shows the area of unreserved high-quality wilderness outside provisional coupes on public land.



5.2.1 The ‘current opportunities’ approach’s potential contribution to the social and economic objectives

The ‘current opportunities’ approach has the potential to contribute the following the Regional Forest Agreement’s social and economic objectives:

- It would provide for continuing access (including roading access) to all provisional coupes for wood production (see Map 5.3).
- The current sustainable supply of high-quality eucalypt sawlog and veneer logs, at 300 000 cubic metres a year, would be maintained.
- Special-species timber sawlogs and veneer logs would be supplied at Forests and Forest Industry Strategy target levels.
- Current levels of access and current management arrangements for mineral exploration and mining in Strategic Prospectivity Zones and other areas of moderate, high or unknown mineral resource potential would be maintained.
- The existing area of Multiple Use Forest would be maintained.
- Access to Multiple Use Forest for tourism, recreation, apiculture, firewood collection and the harvest of minor forest products would be maintained.
- There would be continuing secure access to priority areas of public land for plantation establishment and thinning (see Map 5.4).
- The gross value of production of the hardwood-processing sector would increase by up to \$2.1 billion, including exports of \$1.1 billion, and the number of jobs would increase by about 1300 (see Table 5.1).
- The projected Gross State Product, employment and exports in the Tasmanian economy would increase (see Table 5.2).
- It would help enhance certainty for local communities and enhance those communities’ ability to adapt to change through increased direct and indirect employment and an influx of new families associated with the projected industry developments. This would have a positive effect on the continued availability of community services in regional areas (see Table 5.3).



Table 5.1 Projected economic contribution of the wood-processing sector: the ‘current opportunities’ approach

Indicator	1996 ^a	2020 ^a
Gross value of production (\$m/yr) ^b	890	+2 083 (+234%)
Employment (no. Of jobs)	4 275	+1 324 (+31%)
Export value (\$m/yr) ^b	267	+1 041 (+390%)

a. The 1996 column shows the gross value of production, employment and exports for the wood-processing sector. The 2020 column shows the projected increase in these measures if the Margules Groome Pöyry industry developments were to occur.

b. In 1997 dollars.

Source: ABARE (1997)—see Appendix E.

Note: The wood-processing sector takes in the processing of veneer, sawn timber, manufactured panels, woodchips, pulp and paper.

Table 5.2 Projected economic contribution of the forest industry sector to Tasmania: the ‘current opportunities’ approach

Indicator	1996 ^a	2020 ^a
Gross State Product (\$m/yr) ^b	9 762	+1 141 (+12%)
Employment (no. Of jobs)	201 100 ^c	+6 730 (+3%) ^d
Export value (\$m/yr) ^b	1 673	+815 (+49%)

a. The 1996 column shows the Gross State Product, employment (full time and part time) and exports for the Tasmanian economy. The 2020 column shows the projected increase in these measures if the Margules Groome Pöyry industry developments were to occur. The 2020 column shows full-time equivalent figures.

b. In 1997 dollars.

c. Full and part-time jobs.

d. Full-time jobs.

Note: The analyses in Table 5.1 and Table 5.2 used different methodologies, so the precise numbers generated are not directly comparable.

Source: Centre for Regional Economic Analysis data—see Appendix E.

Table 5.3 Projected social contributions arising from the forest industry sector: the ‘current opportunities’ approach

Development	New direct employment (no. of jobs)	Family ^a
Medium-density fibreboard mills—for example, Longreach and Triabunna	700	276
	100	90
Chemical pulp and printing mill—for example, Burnie	670	471
Mechanical pulp mill—for example, Hampshire	330	183
Plywood mill—for example, Huonville	100	186

a. The increase in family members, assuming that 50 per cent of the increase in direct employment is from new arrivals to towns.

Note: The locations are for illustrative purposes; it is not suggested that these would be the precise locations for industry developments.



5.2.2 The ‘current opportunities’ approach’s potential contribution to the environment and heritage objectives

The ‘current opportunities’ approach has the potential to contribute the following to the Regional Forest Agreement’s environment and heritage objectives:

- The area of protected high-quality wilderness would be increased by 181 280 hectares, giving a total of 1 829 000 hectares, or 94 per cent of current high-quality wilderness (see Table 5.4).
- It would make good 141 420 hectares (75 per cent) of the current combined area shortfall in meeting the JANIS old-growth forest and forest community criteria that can be achieved on public land.
- It would reserve 104 510 hectares of old-growth forest out of a total of 149 710 hectares towards meeting the JANIS old-growth criteria, including an additional 2230 hectares of rare and depleted old-growth, resulting in
 - meeting the JANIS old-growth criteria fully for an additional seven old-growth communities; bringing the total to 21 out of 43
 - adding to the area required to meet the old-growth JANIS criteria for an additional 20 old-growth forest communities, of which 10 are rare or depleted (see Table 5.5).
- An additional 92 280 hectares of forest out of a total of 215 510 would be reserved, thereby
 - fully meeting the JANIS forest community criteria for an additional 10 forest communities; bringing the total to 28 out of 50 communities—one of the 10 is a rare community
 - adding to the area required to meet the JANIS forest community criteria for an additional 20 communities, of which 13 are rare, vulnerable or endangered (see Table 5.5).
- All the known, verified locations on public land (see Map 3.2) of nine of the priority flora species and some additional locations for another 11 priority flora species, including two that are not currently reserved at all, would be reserved. Further analysis is being done for the verified locations of the remaining priority species, which are not shown on the map.
- All known locations on public land for one of the eight category 1 fauna species and some additional locations for another three category 1 fauna species would be reserved.
- Areas adjacent to some existing reserves would be added; this would enhance reserve integrity and add new areas that would form viable reserves in their own right.



- It would increase protection of all indicative National Estate values, resulting in a protection level of 45 per cent or more for 27 of the 29 indicative National Estate values (see Table 5.6).

If the tenure of additional reserves prevents access for mineral exploration and mining and other specific multiple uses, the potential levels of disturbance and threats to ecological processes would be reduced. This could provide benefits for a range of reserve design considerations.

Table 5.4 Potential contribution to the JANIS wilderness criteria: the ‘current opportunities’ approach

Approach	Area of protected wilderness (ha)	Percentage of wilderness protected	Total area of forest in protected wilderness (ha)	Percentage of forest in protected wilderness
Current situation	1 665 680	86	653 960	79
‘Current opportunities’	1 829 000	94	733 590	89

5.2.3 The ‘current opportunities’ approach’s potential consequences for the social and economic objectives

The full economic and social potential of the forest industry sector is not reached under the ‘current opportunities’ approach. The approach might, however, provide some adverse impacts for special-species timbers if areas currently outside provisional coupes were found to have resource value. If access to additional reserves for mineral exploration and mining were precluded under this approach there could be significant social and economic affects, which would arise largely because of the coincidence of areas of moderate to high mineral prospectivity and areas with high conservation and heritage values.

Eighty-six per cent of the area of high-quality wilderness is currently in dedicated and informal reserves (69 and 17 per cent respectively). If access to currently accessible informal reserves in areas of high-quality wilderness were denied for mineral exploration and mining, approximately 218 000 hectares (or 6.7 per cent of the total area of moderate to high mineral resource potential in Tasmania) would be unavailable.



Table 5.5 Potential contribution to JANIS old-growth and forest community criteria—the ‘current opportunities’ approach

Forest community	Old-growth forest						Reservation achievable under this approach (%)	Current area below JANIS target ^a (ha)	Additional area of forest required to meet JANIS criteria (ha) ^b
	Current area below JANIS target (ha)	Area in public land outside provisional coupes (ha)	Criteria met in public land outside provisional coupes	Area below JANIS target under this approach (ha)	Reservation (%)				
No further reservation required—old-growth and forest community criteria met within existing reserves									
<i>Eucalyptus coccifera</i>	0	3 080	..	-3 080	79	88	0	0	
King Billy pine – deciduous beech ^e	0	30	..	-30	92	93	0	0	
Huon pine	0	910	..	-910	88	100	0	0	
<i>Leptospermum – Melaleuca</i> swamp forest	0	1 920	..	-1 920	76	96	0	0	
Short rainforest	0	90 430	..	-90 430	67	93	0	0	
<i>E. nitida</i> dry	0	16 940	..	-16 940	80	95	0	0	
<i>E. nitida</i> wet	0	3 060	..	-3 060	91	97	0	0	
Pencil pine – deciduous beech ^e	0	0	..	0	100	100	0	0	
Pencil pine ^e	0	0	..	0	100	100	0	0	
<i>Acacia dealbata</i>	..	0	..	0	..	..	0	0
<i>E. subcrenulata</i>	0	150	..	-150	88	89	0	0	
King Billy pine ^e	0	2 000	..	-2 000	88	100	0	0	
Old-growth and forest community criteria able to be met outside provisional coupes on public land									
<i>A. melanoxylon</i> on flats	0	0	..	0	..	..	1 450	1 450
<i>A. melanoxylon</i> on rises	..	0	..	0	..	..	1 740	1 740
<i>E. delegatensis</i> dry	7 790	13 180	yes	-5 390	50	67	0	0	
Tall rainforest	16 510	44 650	yes	-28 140	50	78	0	0	
Furneaux <i>E. nitida</i>	0	0	..	0	..	..	540	540
<i>E. obliqua</i> dry	9 060	13 330	yes	-4 270	41	69	1 820	0	
<i>E. obliqua</i> wet	21 170	22 880	yes	-1 710	35	62	14 960	0	
<i>E. tenuiramis</i> on granite	460	1 290	yes	-830	44	88	0	0	
<i>E. tenuiramis</i> on dolerite	1 100	2 310	yes	-1 210	40	82	0	0	
Old-growth or forest community criteria not able to be met outside provisional coupes on public land									
Coastal <i>E. amygdalina</i>	11 440	10 670	no	770	31	58	21 160	10 490	
<i>E. amygdalina</i> on dolerite	12 500	7 310	no	5 190	19	43	23 570	16 260	
<i>E. delegatensis</i> wet	11 800	10 630	no	1 170	49	59	0	0	
<i>E. pauciflora</i> on sediments	0	100	..	-100	63	66	800	700	
<i>E. regnans</i>	3 080	1 570	no	1 510	37	49	1 600	30	
Inland <i>E. amygdalina</i> ^{de}	2 710	80	no	2 630	5	8	14 080	14 000	
<i>E. amygdalina</i> on sandstone ^e	3 260	1 190	no	2 070	11	29	16 260	15 070	
<i>E. brookeriana</i> ^{de}	650	30	no	620	6	10	2 470	2 440	
<i>Callitris rhomboidea</i> ^e	130	90	no	40	38	53	200	110	
<i>E. viminalis</i> – <i>E. ovata</i> – <i>E. amygdalina</i> – <i>E. obliqua</i> damp sclerophyll ^d	1 800	750	no	1 050	27	57	6 850	6 090	
<i>E. viminalis</i> and/or <i>E. globulus</i> coastal ^e	390	0	no	390	14	14	450	450	



Grassy <i>E. globulus</i> ^e	230	1 060	yes	-830	55	77	4 440	3 380
<i>Melaleuca ericifolia</i> coastal	280	160	no	120	10	62	380	220
<i>Notelaea ligustrina</i> and/or <i>Pomaderris apetala</i> ^e	0	40	..	-40	70	86	100	60
Shrubby <i>E. ovata</i> ^{de}	360	40	no	320	24	32	6 940	6 900
<i>E. pulchella</i> – <i>E. globulus</i> – <i>E. viminalis</i> grassy	29 160	13 610	no	15 550	14	36	18 920	5 310
<i>E. pauciflora</i> on dolerite ^d	950	40	no	910	49	50	1 820	1 780
<i>E. rodwayi</i> ^d	610	20	no	590	16	19	1 510	1 490
<i>E. sieberi</i> on other substrates ^d	1 350	550	no	800	19	52	1 580	1 030
<i>E. sieberi</i> on granite ^d	780	450	no	330	19	66	720	390
Inland <i>E. tenuiramis</i> ^e	3 960	650	no	3 310	10	18	29 750	29 100
<i>E. viminalis</i> grassy ^d	7 960	260	no	7 700	6	9	34 980	34 720
<i>E. viminalis</i> wet ^{de}	80	10	no	70	42	50	3 860	3 850
<i>Allocasuarina verticillata</i>	130	80	no	50	46	54	0	0
<i>Banksia serrata</i> woodland ^e	40	0	no	0	75	75	40	40
King Island <i>E. globulus</i> – <i>E. brookeriana</i> – <i>E. viminalis</i> ^e	0	0	..	0	..	..	2 300	2 300
<i>E. morrisbyi</i> ^e	0	0	..	0	..	..	20	20
<i>E. risdonii</i> ^{de}	10	0	no	0	16	16	60	60
Furneaux <i>E. Viminalis</i> ^e	0	0	..	0	..	..	140	140
Total	149 730	265 550		+45 190			215 510	160 160
				-161 040				4

.. Not applicable.

a. Includes old growth.

b. After old growth outside provisional coupes.

c. Percentage of existing area—other

percentages are of pre-1750 area. d. Rare and depleted old growth.

e. Rare, vulnerable or endangered forest community.



Table 5.6 Potential protection status of indicative National Estate values: the ‘current opportunities’ approach

Indicative National Estate value	Current situation			‘Current opportunities approach’	
	Total area of value (ha)	Total area protected (ha)	Percentage protected	Total area protected (ha)	Percentage protected
Aesthetics	259 119	204 029	79	236 252	91
Flora centres of endemism	378 289	318 966	84	336 169	89
Fauna centres of endemism	357 162	94 912	27	165 319	46
Disjunct flora	97 600	57 481	59	72 544	74
Disjunct fauna	48 308	23 765	49	27 865	58
Fauna richness	120 664	34 862	29	53 847	45
Flora limits	239 568	112 833	47	168 955	71
Flora richness	334 621	197 975	59	269 708	81
Geoheritage	3 440 655	2 279 189	66	2 863 105	83
Historic values	515	415	81	466	90
Key fauna habitat	1 752 699	555 211	32	825 854	47
Fauna limits	293 011	89 074	30	134 364	46
Research, teaching, reference sites	229 124	170 409	74	197 405	86
Fauna type localities	16	9	56	12	75
Flora type localities	42	31	74	35	83
Primitive and relictual fauna	462 127	335 199	73	367 160	79
Primitive and relictual flora	189 710	122 571	65	170 284	90
Rare communities	168 116	30 460	18	44 332	26
Refugia present	149 587	103 648	69	131 275	88
Refugia from past processes	218 373	128 846	59	195 438	89
Remnant vegetation	32 120	159	0	505	2
Representative vegetation	2 843 128	1 964 551	69	2 490 137	88
Representative wetland areas	24 397	4 213	17	22 206	91
Social values	192 420	146 894	76	171 353	89
Succession sites	46 490	44 423	96	45 258	97
Wilderness	1 943 570	1 665 680	86	1 889 360	97
Old-growth forest	848 842	583 543	69	750 792	88
Natural landscapes	2 537 864	1 888 277	74	2 350 716	93
Undisturbed catchments	1 377 669	1 256 710	91	1 358 018	99



Ninety-four per cent of the area of high-quality wilderness is assumed reserved under the ‘current opportunities’ approach. If access to the additional 8 per cent identified under this approach were denied for mineral exploration and mining, an additional 238 000 hectares (or 18.6 per cent of the total area of moderate to high mineral resource potential in Strategic Prospectivity Zones) would be unavailable. This would have several important consequences:

- Investor confidence and exploration expenditure in the remaining available areas would decrease.
- The mining communities of Waratah, Rosebery, Zeehan, Strahan and Queenstown would be adversely affected.
- The possible economic benefits accruing from new mines and mineral processing based on known resources and undiscovered deposits would be diminished. The possible extent of these benefits forgone is indicated in Chapters 3 and 4.
- Under State legislation large amounts of compensation could be payable to the holders of mineral tenements if reservation of wilderness resulted in the revocation of those tenements.

Changes to current access and management arrangements also have the potential to affect tourism, traditional recreation, apiary and other forest uses. If such arrangements preclude the development of the visitor infrastructure (including roading) necessary for accommodating a projected doubling of nature-based tourism, the economic consequences could be great. Chapter 3 provides an estimate of the upper value of potential benefits forgone.

Traditional and recreational users currently rely on access to forested lands for a number of activities—hunting, horse riding, recreational vehicle use, cultural association with forests, and so on. If access to reserved areas for particular activities is denied then opportunities for enjoyment in forested areas will be reduced.

5.2.4 The ‘current opportunities’ approach’s potential consequences for the environment and heritage objectives

The ‘current opportunities’ approach would have the following potential consequences for the Regional Forest Agreement’s environment and heritage objectives:

- The extent of high-quality wilderness in Tasmania would be reduced over time by about 6 per cent (117 000 hectares) because planned forestry activities in provisional coupes (including roading) within and adjacent to high-quality wilderness areas would reduce wilderness quality, isolate and fragment areas of high-quality wilderness, and reduce to below 8000 hectares one area (Little Henty) that formerly met the 8000-hectare threshold.
- In terms of the JANIS old-growth criteria, there would be a shortfall of 45 200 hectares of old-growth forest, 21 900 hectares of which could be met only from private land.
- In terms of the JANIS criteria for forest communities, there would be 90 480 hectares of the total 123 230 hectare shortfall which could be met only from private land.

- In terms of the JANIS criteria for both forest communities and old-growth forest, there would be a combined shortfall of 143 700 hectares, 97 800 of which could be made good only from private land.
- For priority species there would be a shortfall in reservation on public land.
- Some indicative National Estate values would fall outside the reserve system (see Table 5.6).

Among other possible consequences are the following:

- Some of the additional reservation would probably be in the form of scattered, smaller areas not complying with reserve design principles. The result would be increased management costs.
- Some potential reserves might not be viable over time because they may be exposed to threatening processes and would probably have higher boundary–area ratios.
- Some reserves with lower site quality might be established; for example, less fertile, steeper areas.
- Reservation of some old-growth forest would be in smaller, more scattered areas, regardless of whether natural occurrences are in larger areas. This would adversely affect species requiring large, undisturbed areas of old-growth forest for survival.

If access for minerals exploration and mining and other forest uses is maintained there may be disturbances that diminish environment and heritage values, and this might limit the ability of these values to persist over time. This observation is applicable to all the approaches discussed in this chapter.

5.3 The ‘enhanced forest industry opportunities’ approach

The ‘enhanced forest industry opportunities’ approach builds on the ‘current opportunities’ approach by increasing plantation establishment on public land for hardwood and softwood sawlog supply and increasing the rate of thinning of eucalypt regrowth forests. This would in turn provide the opportunity for enhanced forest industry development. Plantations on private land are assumed to be developed at the rate assumed in the ‘current opportunities’ approach.

The Margules Groome Pöyry report (1997—see Box 5.1) identified a large potential deficit in the supply of hardwood timber relative to projected demand in the Asia–Pacific region. The ‘enhanced forest industry opportunities’ approach aims to place Tasmania in a position to take greater advantage of this by providing a sustainable increase in the supply of eucalypt veneer logs and sawlogs. It would allow the eucalypt sawn timber and decorative veneer and plywood sectors to expand to meet some of the growing demand in the Asia–Pacific region. Growth in supply and expanded industrial development are expected to occur within the first few years of the Regional Forest Agreement’s life.

Access to increased quantities of resource under this approach would help industry become more competitive in supplying international and domestic markets for high-grade eucalypt sawn timber and other forest products. For illustrative purposes, under this approach the area for intensive forest management is assumed to be 15 per cent of the current area of Multiple Use Forest; this is about 210 000 hectares that Forestry Tasmania assessed as having potential for intensive forest management. The approach assumes this land is available and that increased plantation establishment and thinning rates begin immediately and are maintained for up to 40 years. Plantations would be managed primarily



for sawlog production and would be established on existing native forest sites. Additional plantations could be established on purchased freehold land.

By intensively managing 15 per cent of the Multiple Use Forest this approach is projected to achieve a sustainable yield of 500 000 cubic metres a year of high-quality eucalypt sawlogs and veneer logs. Forestry Tasmania estimated an additional 200 000 cubic metres of low-quality sawlogs and a further 1.15 million tonnes of eucalypt pulpwood would be available. The sustainable yield after 20 years is projected to be higher than 500 000 cubic metres a year after taking into account the greater productivity generated by intensively managed forests, new markets, new products and new processing technologies. The ‘enhanced forest industry opportunities’ approach depends on reserving areas outside provisional coupes for environment and heritage values, as in the ‘current opportunities’ approach. There would, however, be a greater level of disturbance over the area of Multiple Use Forest—approximately 210 000 hectares of provisional coupes. A number of the recommendations of the Expert Advisory Group on Ecologically Sustainable Forest Management relate to plantation establishment, including the development of a statewide policy in this regard (see PLUC 1997a).

5.3.1 The ‘enhanced forest industry opportunities’ approach’s potential contribution to the social and economic objectives

The ‘enhanced forest industry opportunities’ approach has the potential to make the following contributions to the social and economic objectives, additional to those anticipated for the ‘current opportunities’ approach:

- The sustainable yield of high-grade eucalypt veneer logs and sawlogs would be increased to 500 000 cubic metres a year and would increase further after 20 years.
- The international competitiveness of the wood-processing sector would be enhanced.
- There would be immediate and continuing opportunities for forest industry development (particularly expanded production for existing industries) and associated growth in regional employment, exports and Gross State Product (see Tables 5.7 and 5.8).
- Security would be enhanced for communities involved in intensive forest management and wood processing.
- Further long-term industry and employment opportunities would arise when the additional plantations are harvested.

Tables 5.7 and 5.8 show the projected economic contributions of the wood-processing sector under the ‘enhanced forest industry opportunities’ approach in comparison with those under the ‘current opportunities’ approach.



Table 5.7 Projected economic contribution of the wood-processing sector: the ‘enhanced forest industry opportunities’ approach compared with the ‘current opportunities’ approach

Indicator	2020—‘current opportunities’ approach	2020—‘enhanced forest industry opportunities’ approach
Gross value of production (\$m/yr) ^a	+2 083	+227 (+11%)
Employment (no. of jobs)	+1 324	+631 (+48%)
Export value (\$m/yr) ^a	+1 040	+91 (+9%)

a. In 1997 dollars.

Source: ABARE (1997)—see Appendix E.

Table 5.8 Projected economic contribution of the forest industry sector to Tasmania: the ‘enhanced forest industry opportunities’ approach compared with the ‘current opportunities’ approach

Indicator	2020—‘current opportunities’ approach	2020—‘enhanced forest industry opportunities’ approach
Gross State Product (\$m/yr) ^a	+1 141	+272 (+24%)
Employment (no. of jobs)	+6 730	+2 333 (+35%)
Export value (\$m/yr) ^a	+815	+133 (+16%)

a. In 1997 dollars.

Source: Centre for Regional Economic Analysis data—see Appendix E.

5.3.2 The ‘enhanced forest industry opportunities’ approach’s potential contribution to the environment and heritage objectives

In general, the potential contribution of the ‘enhanced forest industry opportunities’ approach would be similar to that described for the ‘current opportunities’ approach, although conversion of some cleared private land to plantations might benefit catchment management and some biodiversity values.

If access to additional reserves for mineral exploration and mining and other forest uses were precluded, the contribution of this approach is the same as that identified for the ‘current opportunities’ approach.

5.3.3 The ‘enhanced forest industry opportunities’ approach’s potential consequences for the social and economic objectives

The ‘enhanced forest industry opportunities’ approach could adversely affect tourism and recreation, apiculture and water quality. If access to any additional reserves for mineral exploration and mining and other forest uses were precluded, the consequences under this approach are the same as those identified for the ‘current opportunities’ approach.



5.3.4 The ‘enhanced forest industry opportunities’ approach’s potential consequences for the environment and heritage objectives

In general, the consequences of the ‘enhanced forest industry opportunities’ approach would be similar to those of the ‘current opportunities’ approach. The intensification of forest management to 15 per cent of Multiple Use Forest through replacement of native forest with plantations or thinning of native forests would, however, lead to increased adverse effects on a number of conservation values. For example, the increased level and extent of disturbance under this approach would affect forest structure in the area under intensive management. It would also affect environment and heritage values in some adjacent areas.

Some management prescriptions designed to maximise wood production through intensification could conflict with management prescriptions designed to maintain biodiversity: for example, fire regimes.

5.4 The ‘enhanced protection of old-growth forest and biodiversity’ approach

The ‘enhanced protection of old-growth forest and biodiversity’ approach extends the ‘current opportunities’ approach to improve environment and heritage outcomes. It explores the potential contribution to, and consequences of, meeting the JANIS old-growth forest criteria on public land and is based on meeting the quantitative JANIS criteria. Criteria such as biophysical naturalness, IBRA representation, reserve design and priority species are not specifically considered, nor are the opportunities that might arise by combining this approach and the ‘enhanced forest industry opportunities’ approach.

There are approximately 850 000 hectares of provisional coupes on public land in Tasmania. Under this approach, about 45 900 hectares of forest in provisional coupes, additional to the area specified in the ‘current opportunities’ approach, would be required to fully meet the quantitative JANIS criteria for forest communities and old-growth forests on public land.

The provisional coupes making up the 45 900 hectares were selected on the following basis:

- priority selection of provisional coupes containing values that require all areas on public land to be protected;
- secondary selection of provisional coupes classified as of less importance for wood production (see Map 5.3) and containing values still requiring additional protection;
- where additional areas are still required, coupes selected on the basis of least-area capture of non-target forest communities within the coupe.

More than the 45 900 hectares would need to be withdrawn from wood production on public land to reserve identified values. Without additional detailed analysis of each of the values and of the options for reserving the values, it is not possible to determine what would be the additional withdrawal of resources or where their locations would be. The potential contributions and consequences of this approach, for both the social and economic and the environment and heritage objectives have been assessed at the 45 900 hectares level and an upper level of 82 500 hectares. The upper level was based on whole coupes being chosen. Map 5.5 shows the location and extent of the coupes chosen for this approach.

Not all of the 82 500 hectares might be needed. For example, in many cases rare forest communities are mapped in only small portions of the coupe and could be excluded from coupes by prescription.

Table 5.9 shows the area of forest in provisional coupes selected to ensure that forest community and old-growth JANIS criteria are met, as far as possible, on public land. Any remaining shortfalls in meeting the JANIS criteria could be met only from private land.



5.4.1 The ‘enhanced protection of old-growth forest and biodiversity’ approach’s potential contribution to the social and economic objectives

Without further development of industry opportunities, the ‘enhanced protection of old-growth forest and biodiversity’ approach does not make any contribution to social and economic objectives beyond that offered by the ‘current opportunities’ approach.

5.4.2 The ‘enhanced protection of old-growth forest and biodiversity’ approach’s potential contribution to the environment and heritage objectives

When based on an additional 82 500 hectares, the ‘enhanced protection of old-growth forest and biodiversity’ approach has, above the ‘current opportunities’ approach, the potential to make the following contributions to the Regional Forest Agreement’s environment and heritage objectives:

- Out of a shortfall of 45 200 hectares, It would contribute an additional 23 360 hectares towards meeting the JANIS old-growth forest criteria for 18 communities on public land, including 2180 hectares for 9 rare and depleted communities, thereby
 - meeting the JANIS old-growth criteria for an additional five forest communities, bringing the total to 26 out of 43 old-growth communities
 - adding to the JANIS old-growth criteria for 13 of the 15 remaining forest communities.
- Out of a shortfall of 123 230 hectares, it would contribute an additional 31 950 hectares towards meeting the JANIS forest community criteria for 15 communities, including 13 820 hectares of rare, vulnerable or endangered communities, thereby
 - meeting the JANIS forest community criteria for an additional four forest communities, bringing the total to 32 out of 50 communities
 - adding to the JANIS criteria for 12 of the remaining 18 forest communities.



Table 5.9 Area of forest and old-growth communities reserved in the 82 500 hectares of provisional coupes: the ‘enhanced old-growth forest and biodiversity’ approach

Forest community	(hectares)				
	Old-growth forest			Shortfall after this approach	Shortfall after ‘current opportunities’ approach
	Shortfall after ‘current opportunities’ approach	Area in selected coupes	Excess area protected		
No further reservation required—old-growth and forest community criteria met within existing reserves					
<i>Eucalyptus coccifera</i>	0	40	40	..	
King Billy pine-deciduous beech ^a	0	0	0	..	
King Billy pine ^a	0	0	0	..	
Huon pine	0	0	0	..	
<i>Leptospermum–Melaleuca</i> swamp forest	0	0	0	..	
Short rainforest	0	130	130	..	
<i>E. nitida</i> dry	0	0	0	..	
<i>E. nitida</i> wet	0	0	0	..	
Pencil pine-deciduous beech ^a	0	0	0	..	
Pencil pine ^a	0	0	0	..	
<i>Acacia dealbata</i>	0	0	0	..	
<i>E. subcrenulata</i>	0	0	0	..	
Old-growth and forest community criteria able to be met outside provisional coupes on public land					
<i>A. melanoxylon</i> on flats	0	0	0	..	
<i>A. melanoxylon</i> on rises	0	0	0	..	
<i>E. delegatensis</i> dry	0	2 250	2 250	..	
Tall rainforest	0	140	140	..	
<i>E. obliqua</i> dry	0	1 430	1 430	..	
<i>E. obliqua</i> wet	0	1 880	1 880	..	
<i>E. tenuiramis</i> on granite	0	20	20	..	
<i>E. tenuiramis</i> on dolerite	0	370	370	..	
Old-growth and forest community criteria able to be met within provisional coupes					
Coastal <i>E. amygdalina</i>	770	1 730	960	..	
<i>E. amygdalina</i> on dolerite	5 190	5 890	700	..	11 390
<i>E. delegatensis</i> wet	1 170	1 440	270	..	
<i>E. pauciflora</i> on sediments	0	110	110	..	230
<i>E. regnans</i>	1 510	1 510	0	..	
Old-growth or forest community criteria not able to be met on public land					
Inland <i>E. amygdalina</i> ^{ab}	2 630	30	..	-2 600	13 600
<i>E. amygdalina</i> on sandstone ^a	2 070	3 160	1 090	..	13 210
<i>E. brookeriana</i> ^{ab}	620	20	..	-600	1 600
<i>Callitris rhomboidea</i>	40	30	..	-10	
<i>E. viminalis</i> / <i>E. ovata</i> / <i>E. amygdalina</i> / <i>E. obliqua</i> damp sclerophyll ^b	1 050	790	..	-260	3 710
<i>E. viminalis</i> and/or <i>E. globulus</i> coastal ^a	390	0	..	-390	430



Grassy <i>E. globulus</i> ^a	0	290	290	..	2 88
<i>Melaleuca ericifolia</i> ^a	120	0	..	-120	21
<i>Notelaea ligustrina</i> and/or <i>Pomaderris apetala</i>	0	10	10	..	6
Shrubby <i>E. ovata</i> ^{ab}	320	20	..	-300	6 75
<i>E. pulchella</i> - <i>E. globulus</i> - <i>E. viminalis</i> grassy	15 550	10 110	..	-5 440	21
<i>E. pauciflora</i> on dolerite ^b	910	470	..	-440	1 30
<i>E. rodwayi</i> ^b	590	40	..	-550	1 40
<i>E. sieberi</i> on other substrates ^b	800	410	..	-390	
<i>E. sieberi</i> on granite ^b	330	230	..	-100	
Inland <i>E. tenuiramis</i> ^a	3 310	330	..	-2 980	26 91
<i>E. viminalis</i> grassy ^b	7 700	130	..	-7 570	33 74
Wet <i>E. viminalis</i> ^a	70	40	..	-30	3 59
<i>Allocasuarina verticillata</i>	50	0	0		
<i>Banksia serrata</i> woodland ^a	0	0	0	..	4
King Island <i>E. globulus</i> / <i>E. brookeriana</i> / <i>E. viminalis</i> ^a	..	0	0	..	1 70
<i>E. morrisbyi</i> ^a	0	0	0	..	2
<i>E. risdonii</i> ^{ab}	0	0	0	..	5
Furneaux <i>E. viminalis</i> ^a	..	0	0	..	2
Total	45 190	33 050	9 690	-21 780	123 23

a. Rare, vulnerable or endangered forest community. b. Rare and depleted old growth... Not applicable.



- Protection of populations and known locations of threatened flora and fauna, specifically four known locations of category 1 fauna species and three known verified locations of priority flora species (see Map 3.2), including the only known location of one species, would be increased. Analysis is currently being done for the verified locations of the remaining priority species, which are not shown on the map.
- Existing reserve size would be increased and the integrity of some reserves would be enhanced—in some cases, contiguous coupes containing values below the JANIS criteria would form viable reserves in their own right (see Map 5.5).
- The area of protection of all indicative National Estate values, in particular rare communities (9 per cent), disjunct fauna (8 per cent) and faunal richness (5 per cent), would be increased. More than 50 per cent of the area of 25 of the 29 indicative National Estate values would be protected.

If access to any additional reserves for mineral exploration and mining and other forest uses were precluded, the contributions focusing on forest community values in reserves under this approach would be slightly greater than those identified under the ‘current opportunities’ approach.

5.4.3 The ‘enhanced protection of old-growth forest and biodiversity’ approach’s potential consequences for the social and economic objectives

The area selected for additional reservation under the ‘enhanced protection of old-growth forest and biodiversity’ approach could vary from 45 900 hectares to 82 500 hectares. The potential social and economic consequences tend to vary in proportion to these figures. Under current management arrangements and without considering enhancement opportunities on public land, the potential consequences for the Regional Forest Agreement’s social and economic objectives are as follows:

- a loss of access to forest resource equivalent to between 1 million and 1.5 million cubic metres of high-quality eucalypt sawlog and veneer log—approximately three to five years of current production
 - a reduced supply of sawlogs from the commercially important *Eucalyptus regnans*, *E. obliqua* wet and dry and *E. delegatensis* wet and dry forest communities. To meet the JANIS old-growth target about one-quarter of the currently available *E. regnans* old-growth in provisional coupes would be required,
 - a reduction of up to 215 hectares of provisional coupes containing *Acacia melanoxylon* (blackwood on flats) would limit the possibility of meeting the Forests and Forest Industry Strategy supply levels for the species;
- a reduction of between 7.6 million and 11.3 million tonnes of pulpwood;
- a reduction of up to 26 000 hectares in the area of public land suitable for thinning and plantation establishment;



- potential constraints on access to some provisional coupes by changes in roading as a result of changed reserve design.

When averaged over the next 30 years these consequences would result in the following average declines in forest production:

- between 30 000 and 47 000 cubic metres a year of high-quality eucalypt sawlog and veneer log (10 to 15 per cent of the legislated supply requirement);
- between 230 000 and 350 000 tonnes of pulpwood (12 to 18 per cent of current supply).

Projected economic consequences, compared with the ‘current opportunities’ approach, for the wood-processing sector and the State’s economy are based on the removal of 82 500 hectares from wood production, as shown in Tables 5.10 and 5.11. The removal of 45 900 hectares (rather than 82 500 hectares) reduces the resource losses by about one-third. The resulting economic consequences would probably be proportional to the resource loss.

If access to additional reserves for mineral exploration and mining and other forest uses were precluded, the consequences under this approach could be greater than those identified under the ‘current opportunities’ approach. Up to an additional 82 500 hectares of forested land is required under this approach to achieve biodiversity and old-growth objectives. Some of this area coincides with Strategic Prospectivity Zones. If access to these areas were precluded, there may be additional consequences beyond those for the ‘current opportunities’ approach in terms of investment in mineral exploration, compensation for withdrawal of mineral tenements, and towns dependent on mineral exploration and mining.

Table 5.12 summarises the projected short- to medium-term social effects associated with this approach. This is a broad-scale, qualitative assessment. It takes into account projected effects on forest contractors, their employees and their families. It also estimates flow-on effects on people relying on forest industries and on social and community infrastructure and community vitality.

Table 5.10 Projected economic effects on the wood-processing sector: the ‘enhanced protection of old-growth forest and biodiversity’ approach compared with the ‘current opportunities’ approach

(percentage change)

Indicator	Immediate ^a	2020
Gross value of production	-5.8	-2.5
Export value	-8.0	-2.7
Employment ^b	0	-5.7

a. Estimated impact following implementation of this approach, based on 1996 data.

b. FORUM is based on the assumption that immediately following a reduction in wood supply, employment levels are initially held steady while processors compete for the lower volume of wood available.

Source: ABARE (1997)—see Appendix E.



Table 5.11: Projected economic effects of the forest industry sector on Tasmania: the ‘enhanced protection of old-growth forest and biodiversity’ approach compared with the ‘current opportunities’ approach

Indicator	2020—‘current opportunities’ approach	2020—‘changes resulting from ‘enhanced protection of old-growth forest and biodiversity’ approach
Gross State Product (\$m/yr) ^a	+1 141	-32 (–3%)
Employment (no. of jobs)	+6 730	-498 (–7%)
Export value (\$m/yr) ^a	+815	-22 (–3%)

a. In 1997 dollars.

Note: Changes would begin early next century.

Source: Centre for Regional Economic Analysis data—see Appendix E.

Table 5.12 Projected forest industry–related social impacts: the ‘enhanced protection of old-growth forest and biodiversity’ approach

Impact catchment	Short- to medium-term potential social impact	Associated forest areas (forest blocks)
Burnie	Lower	Reedy Marsh, Mt Arthur, Lefroy
Launceston	Lower–medium	Strickland, Tunbridge, Tooms, Mt Arthur, Mt Connection, Lefroy, Nile, Mt Foster, Elephant
Midlands	Lower–medium	Blue Hill, Dromedary, Swanport
Triabunna	Higher	Mt Connection, Tooms, Mt Morrison, Wielangta, Levendale, Swanport, Bicheno, Elephant, Koonya, Tunbridge
Meander Valley	Lower–medium	Tunbridge, Reedy Marsh, Virginstow, Gadds, Mt Connection, Liffey, Nile
Derwent	Lower	Dromedary
Tasman	Lower	Swanport, Koonya, Wielangta
North-east	Lower–medium	Mt Arthur, Nile

5.4.4 The ‘enhanced protection of old-growth forest and biodiversity’ approach’s potential consequences for the environment and heritage objectives

The ‘enhanced protection of old-growth forest and biodiversity’ approach has the following potential consequences for the Regional Forest Agreement’s environment and heritage objectives:

- It would result in a shortfall of 87 800 hectares of forest (from 18 communities) below the JANIS forest community criteria which could be met only from private land.
- It would result in a shortfall of 20 980 hectares of old-growth forest below the JANIS criteria, which could be made good only from private land.

5.5 The ‘enhanced wilderness protection’ approach

The ‘enhanced wilderness protection’ approach aims to reserve all high-quality wilderness areas on public land. It builds on areas reserved under the ‘current opportunities’ approach. Map 5.2 shows the additional areas. Only 0.2 per cent of high-quality wilderness areas are on private land.

The JANIS wilderness criterion is that 90 per cent, or more if practicable, of the area of high-quality wilderness should be protected in reserves. Practicability, although not defined by JANIS, can be measured in terms of the contributions to and consequences for the social and economic and environment and heritage objectives of the Regional Forest Agreement.

5.5.1 The ‘enhanced wilderness protection’ approach’s potential contribution to the social and economic objectives

The ‘enhanced wilderness protection’ approach would make no contributions to forest industries beyond those offered under the ‘current opportunities’ approach. It could make some contribution to growth in tourism.

5.5.2 The ‘enhanced wilderness protection’ approach’s potential contribution to the environment and heritage objectives

Beyond the ‘current opportunities’ approach, the ‘enhanced wilderness protection’ approach would increase the extent of reservation of high-quality wilderness areas by 6 per cent, to 100 per cent (see Table 5.13).

Table 5.14 shows the additional area of each forest community that would be reserved under the approach, which would make contributions additional to those of the ‘current opportunities’ approach in the following ways:

- Out of a shortfall of 45 200 hectares, it would reserve an additional 36 380 hectares of forest—of which 1490 hectares would contribute towards fully meeting the JANIS old-growth criterion for one additional community (bringing the total to 22 out of 43 communities) and moving closer to meeting the JANIS old-growth criterion for one other community.
- Out of a shortfall of 123 230 hectares, it would reserve an additional 49 400 hectares of forest—of which 20 hectares would contribute towards fully meeting the JANIS forest communities criteria for one additional community.
- An additional 51 000 hectares (1 per cent) of indicative National Estate values would be reserved.
- There would be further reserve design benefits because most of the additional areas that would be protected are adjacent to existing dedicated or informal reserves.



If access to additional reserves for minerals exploration and mining and other forest uses were precluded, a substantially larger area of high-quality wilderness would be reserved and freed of disturbance.

5.5.3 The ‘enhanced wilderness protection’ approach’s potential consequences for the social and economic objectives

The ‘enhanced wilderness protection’ approach, compared with the ‘current opportunities’ approach, has the following potential consequences for the Regional Forest Agreement’s social and economic objectives:

- About 51 000 hectares of provisional coupes would be withdrawn from production, which would mean an estimated loss of high-quality eucalypt sawlogs and veneer logs of 3 million cubic metres, equivalent to total planned production from public land for the next 10 years. This is equivalent to reducing production by 75 000 cubic metres a year, or 25 per cent of current annual production for the next 40 years—the probable period in which harvesting would occur.
- Pulpwood volumes would be reduced by 13 million cubic metres. This is equivalent to a reduction of 350 000 cubic metres a year, or 18 per cent of current production from public land.

The area of available public land with the potential for intensive management would be reduced by 24 000 hectares.

The land allocated to special-timber management units would be reduced by 19 000 hectares (19 per cent), equivalent to 52 per cent of the area of provisional coupes in these units. The loss of access to special-species timbers in the Donaldson River area is of particular importance (see Map 5.2) because of the large amount of deep-red myrtle on basalt soils in this area. This would reduce the supply of special-species timber with an estimated processed annual value of \$4 million based on mill-gate prices. The actual impact on the Tasmanian economy would be greater because some of the timber would be used for high-value uses, such as production of fine furniture. These amounts are in addition to those shown in Table 5.15.

Table 5.13 Protection of high-quality wilderness: the ‘enhanced wilderness protection’ approach

Approach	Area of protected wilderness (ha)	Percentage of wilderness protected	Total area of forest in protected wilderness (ha)	Percentage of forest in protected wilderness
‘Current opportunities’	1 829 000	94	733 590	89
‘Enhanced wilderness protection’	1 943 570	100	823 810	100



Table 5.14 Additional areas of old-growth forest and forest communities protected under the ‘enhanced wilderness protection’ approach

Forest community	Old-growth forest			Criteria met in this approach	Area potentially protected under ‘current opportunities’ approach (ha)
	Area potentially protected under ‘current opportunities’ approach (ha)	Additional area required to meet JANIS criteria (ha)	Additional area under this approach (ha)		
<i>Acacia melanoxylon</i> on flats	..	0	0	..	2 800
<i>A. melanoxylon</i> on rises	..	0	0	..	4 100
<i>E. coccifera</i>	28 770	0	140	..	43 300
<i>E. delegatensis</i> dry	53 280	0	1 100	..	109 600
<i>E. delegatensis</i> wet	61 510	1 170	7 430	yes	101 200
Huon pine	7 560	0	0	..	7 900
<i>Leptospermum–Melaleuca</i> swamp forest	9 540	0	100	..	12 100
Tall rainforest	123 930	0	14 130	..	139 500
Short rainforest	313 720	0	4 910	..	242 700
<i>E. nitida</i> dry	102 400	0	790	..	150 000
<i>E. nitida</i> wet	48 350	0	570	..	69 500
<i>E. obliqua</i> dry	32 440	0	410	..	66 600
<i>E. obliqua</i> wet	51 800	0	5 950	..	145 600
<i>E. pauciflora</i> on sediments ^a	2 820	0	20	..	4 400
<i>E. regnans</i>	6 470	1 510	320	no	21 200
<i>E. subcrenulata</i>	6 650	0	520	..	8 700
King Billy Pine ^b	17 290	0	10	..	18 000
Total	866 530	2 680	36 400		1 147 900

.. Not applicable.

a. Rare and depleted old growth.

b. Rare, vulnerable or endangered forest community.



Tables 5.15 and 5.16 show the projected effects on the wood-processing sector and the Tasmanian economy of this approach compared with the projected effects under the ‘current opportunities’ approach. To a limited extent, some of the losses could be mitigated by economic activity resulting from an increase in wilderness-based tourism and recreation.

If future access for mineral exploration and mining were precluded under this approach, an additional 66 000 hectares of land in Strategic Prospectivity Zones with moderate to high mineral potential would be affected. The economic consequences of this approach are likely to be those identified under the ‘current opportunities’ approach. The consequences in terms of social objectives and compensation payable would also probably be greater than those described for the ‘current opportunities’ approach. Denying access to Strategic Prospectivity Zones could have consequences for the provision of infrastructure (for example, roading, and power and water supply) and for the construction of visitor facilities. Similarly, other forest users such as apiarists and recreational users who rely on the infrastructure might be constrained in their use of forested land.

Table 5.17 summarises the projected short- to medium-term social effects associated with the ‘enhanced wilderness protection’ approach. Any potential impacts on mining communities are not included. This is a broad scale, qualitative assessment. It takes into account projected impacts on forest contractors, their employees and their families. It also estimates flow-on effects on people relying on forest industries and on social and community infrastructure and community vitality.

Table 5.15 Projected economic effects on the wood-processing sector: the ‘enhanced wilderness protection’ approach compared with the ‘current opportunities’ approach

Indicator	(percentage change)	
	Immediate ^a	2020
Gross value of production	-7.3	-3.1
Export value	-8.2	-2.8
Employment ^b	0	-5.7

a. Estimated immediate impact of this approach, based on 1996 data.

b. FORUM is based on the assumption that immediately following a reduction in wood supply, employment levels are initially held steady while processors compete for the lower volume of wood available.

Source: ABARE (1997)—see Appendix E.



Table 5.16 Projected economic effects of the forest industry sector on Tasmania: the ‘enhanced wilderness protection’ approach compared with the ‘current opportunities’ approach

Indicator	2020—‘current opportunities’ approach	2020—‘changes resulting from ‘enhanced wilderness protection’ approach
Gross State Product (\$m/yr) ^a	+1 141	-47 (-4%)
Employment (no. of jobs)	+6 730	-749 (-11%)
Exports (\$m/yr) ^a	+815	-29 (-4%)

a In 1997 dollars.

Source: Centre for Regional Economic Analysis data—see Appendix E.

Table 5.17 Projected short-to medium-term forest industry–related social impacts: the ‘enhanced wilderness protection’ approach

Impact catchment	Short- to medium-term potential social impact	Associated wilderness areas (forest blocks)
Burnie	Lower	Waratah, Pruana, Wandle
Hampshire	Lower	Mt Meredith, Waratah
Fingal	Lower	Tyne
Smithton	High	Frankland, Sumac, Balfour, Temma, Mt Bertha, Waratah, Rapid
Triabunna	Lower–medium	Arve, Denison, Esperance, Picton, Russell, Warra, Styx, Tyenna
Derwent	Medium	Tiger, Wentworth, Clarence, Counsel, Repulse, Styx, Tyenna
Karoola	Lower	Clarence

5.5.4 The ‘enhanced wilderness protection’ approach’s potential consequences for the environment and heritage objectives

The ‘enhanced wilderness protection’ approach has no potential consequences for the Regional Forest Agreement’s environment and heritage objectives.

5.6 Reserve design applications

The four approaches described in this chapter take into account the quantitative JANIS criteria but not the question of whether environment and heritage values would persist over time. In reality, persistence of values depends not only on the extent to which those values are reserved but also on reserve design, ecologically sustainable forest management, and complementary management prescriptions. This section applies restricted, nodal and extensive applications of reserve design principles to two case study areas in order to identify possible contributions and consequences.



There are many other areas where similar considerations are relevant. The possible reserve configurations and the potential social and economic consequences are many. This section illustrates some of this complexity.

Reserve design can take account of factors such as size, shape, condition, site integrity, and environmental gradients. Proximity to threatening events, such as too-frequent fire, can also influence design. Reservation should, where possible, be of values in good condition on good-quality sites, with adequate protection from threatening processes to ensure the long-term survival of the values and the processes that sustain them. Reserve boundaries might also need to be modified to exclude recent disturbance and sites where environment and heritage values are in poor condition. Sites that have been heavily disturbed may be considered for rehabilitation in the context of improving reserve boundaries. Another consideration involves the fact that some environment and heritage values are largely or wholly found on private land. Most reserve design factors applicable to public land are equally applicable to private land, but the protection challenges on private land are different in several important ways. Areas containing environment and heritage values on private land are more likely to be smaller, more scattered and more disturbed. Cooperation with individual landowners, groups of landowners and between landowners and public land managers will be important to ensuring viable protection of values on private land. The consequences for farm viability and farming communities also need to be considered.

5.6.1 Restricted, nodal and extensive reserve design applications

The ‘restricted reserve’ application focuses on reserving critical sites for rare, endangered or depleted values. These sites are protected either as discrete reserves in isolation or as limited areas added to existing reserves. Under this application, many values would not be protected in reserves. If possible, such values could be protected by management prescription.

The ‘nodal reserve’ application primarily uses existing reserves as core areas, or nodes, and expands their boundaries to encompass adjacent high- and medium-priority environmental values in good condition on sites of adequate environmental quality. It seeks to link these nodes with corridors protected as reserves or by management prescription.

The ‘extensive reserve’ application is designed to reserve a range of biodiversity, old-growth, species and National Estate values in large, well-designed, viable reserves.

In general, the level and degree of the contributions and consequences for environmental and heritage and social and economic values increase as the reserve design applications move from restricted through nodal to extensive. The changes are incremental because application of the ‘extensive reserve’ design builds on the nodal application, which in turn builds on the restricted application.

To illustrate the contributions and consequences of these applications, two study areas are used.

Application of reserve design principles to the study areas highlights a number of issues:

- Reserve design for specific values needs to be considered in a regional context.
- The sensitivity of values to disturbance from threatening processes on and adjacent to potential reserves, and the kinds of protection required, need to be considered in order to maximise the persistence of values over time.
- Reserving environment and heritage values efficiently in the same area is desirable but not always possible.
- Consideration of ecological processes is integral to effective reserve design.
- The costs of the intensive management required to maintain values on or off reserve in many scattered small areas are likely to be disproportionately greater than the costs arising when a similar amount of land is reserved in one larger area.



- Reserves need to be of a viable size to increase the likelihood that conservation values will persist over time.
- It will be necessary to complement reservation with appropriate management systems and management prescriptions, both on and off reserve.
- For some values, reserves on public land could be complemented by reservation on private land.
- Reservation of some values sometimes involves inadvertent reservation of other values for which additional reservation is not required to meet JANIS criteria.
- Consideration needs to be given to representative reservation across IBRA regions, rather than on a single site, to meet the quantitative JANIS criteria.
- Effective reserve management has resource implications for governments.
- Areas of high environmental quality often coincide with social and economic values of similar high quality.

5.6.2 The case study areas

Case study area one is south and west of Douglas-Apsley National Park on the mid-eastern coast of Tasmania (see Map 5.6). It contains about 45 000 hectares of State forest and extends to Snow Hill in the west and to the Long Marsh Water Reserve in the south; it is within the Freycinet IBRA region. It contains a number of forest communities and old-growth communities that require additional protection to meet the JANIS criteria (see Table 5.18) and locations of several priority species and extensive indicative National Estate values. It also contains provisional coupes important for wood production, areas with potential for intensive management, and areas of moderate to high mineral resource potential. Case study area two examines the reservation of a single forest community, grassy *Eucalyptus viminalis*. It contains about 3000 hectares of State forest west of Ben Lomond National Park (see Map 5.7). The areas of grassy *E. viminalis* forest on public land are mostly small remnant patches. They are scattered across the State and are usually interspersed with other forest communities and land used for production. As a consequence, it is a forest community for which it is useful to examine reserve design viability, connectivity, ecological processes and IBRA representation.

The total area of grassy *E. viminalis* forest occurring on public land in the case study area is 1240 hectares, which is 45 per cent of all unreserved grassy *E. viminalis* forest on public land. Of the 1240 hectares of grassy *E. viminalis*, 100 hectares is old growth which is 25 per cent of the remaining unreserved area of this community on all public land in Tasmania.

5.6.3 ‘Restricted reserve’ application: case study area one

The ‘restricted reserve’ application in case study area one reserves forest communities on six separate areas of public land (see ‘limited reserve approach’, Map 5.6). These cover a combined area of 6665 hectares, of which 5925 hectares are old-growth forest.

The ‘restricted reserve’ application would need to be complemented by management prescriptions, especially for values not protected by reservation. These include broader landscape values, which are omitted from the reserves, and some values that remain isolated in the landscape and exposed to threatening processes. The habitats for the two endangered species, *Galaxias fontanus* and *Epacris limbata*, would also need to be protected by management prescription.



Potential contribution

The 'restricted reserve' application in case study area one has the potential to contribute the following to the Regional Forest Agreement's objectives:

- It would reserve some areas of forest communities that require all their remaining distribution on public land to be protected to meet the JANIS criteria. These are grassy *Eucalyptus viminalis*, *Callitris rhomboidea*, grassy *E. globulus*, and old-growth *E. pulchella* (see Table 5.18).
- It would protect core habitats for flora and fauna species by management prescription.

Potential consequences

The 'restricted reserve' application in case study area one has the following potential consequences for the Regional Forest Agreement's objectives:

- It would reduce confidence about the long-term survival of some of the identified conservation values in the area; for example, *Callitris rhomboidea* and grassy *E. globulus*.
- Some reserved areas and the ecological processes within them would be subjected to significant levels of disturbance from adjacent activities.
- It would be more expensive to manage because of the greater management attention needed for values that are subject to a higher level of disturbance and because some of the reserves are small and scattered.
- Three thousand and fifty hectares of provisional coupes would be reserved.
- Four hundred and twenty hectares of medium- to high-potential intensive management areas would be reserved.

5.6.4 'Restricted reserve' application: case study area two

The 'restricted reserve' application in case study area two reserves grassy *Eucalyptus viminalis* as four isolated patches, the smallest of which is about 18 hectares in extent. The patches are interspersed with areas of production forest (see 'restricted reserve' approach, Map 5.7).

Potential contribution

The restricted reserve application in case study area two has the potential to reserve all but one areas of grassy *E. viminalis* in the study area.

Potential consequences

The 'restricted reserve' application in case study area two has the following potential consequences for the Regional Forest Agreement's objectives:

- Grassy *E. viminalis* forest communities would be exposed to greater disturbance from adjacent forest operations than would be the case for larger reserves.
- It would be more expensive to manage because of the greater management attention needed for values that are subject to a higher degree of disturbance and because the reserves are small and scattered.



- For at least one patch there would be an inadequate area of reservation to maintain the forest community.
- Seven hundred and twenty hectares of provisional coupes would be included in reserves, with a consequent loss of 23 000 cubic metres of sawlogs and 250 000 cubic metres of pulpwood.
- It would reduce by 650 hectares the area suitable for high–medium intensity management.

5.6.5 ‘Nodal reserve’ application: case study area one

The nodal reserve application in case study area one gives priority to adding to restricted reserves and existing reserves, areas of forest communities and old-growth forest that require additional protection to meet JANIS criteria. Areas containing extensive values are included only where they assist in protecting rare, depleted or endangered forest communities.

This application involves three nodes and covers 7930 hectares of public land outside existing reserves, including an old-growth component of 6236 hectares. The nodes would be discrete reserves (see ‘nodal reserve’ approach, Map 5.6).

The ‘nodal reserve’ application demonstrates the limited extent to which many values coincide on the same site. For example, endangered or rare species do not coincide with values such as rare, vulnerable or depleted old-growth or forest communities.

Potential contribution

In addition to the potential contributions of the ‘restricted reserve’ design application, the ‘nodal reserve’ application in case study area one has the potential to contribute the following to the Regional Forest Agreement’s objectives:

- Conservation values that are limited in distribution elsewhere in the region would be reserved.
- It would contribute to the reservation of several under-reserved forest communities and old-growth forest communities (see Table 5.18).
- All old-growth *Eucalyptus pulchella* in the area would be reserved, noting that this is a community for which the JANIS criteria require protection of all areas on public land. Reservation of this value would also encompass some stands of *E. amygdalina* on dolerite.
- Habitats for the two endangered species in the area, *Epacris limbata* and *Galaxias fontanus*, would be protected by management prescription rather than by reservation.

Potential consequences

In addition to the potential consequences of the ‘restricted reserve’ design application, the ‘nodal reserve’ application in case study one has the following potential consequences for the Regional Forest Agreement’s objectives:

- The area of provisional coupes would be reduced by a further 250 hectares. When added to the ‘restricted reserve’ design application reduction of 3050



hectares, this results in a decrease of about 53 000 cubic metres of sawlogs and 400 000 cubic metres of pulpwood.

- The available area of high or medium potential for intensive forest management would be reduced by a further 60 hectares.

5.6.6 ‘Nodal reserve’ application: case study area two

Under the ‘nodal reserve’ application the same four patches of grassy *Eucalyptus viminalis* community are reserved. Some areas of adjacent forest are added to improve reserve viability (see ‘nodal reserve’ approach, Map 5.7).

Potential contribution

In addition to the potential contributions of the ‘restricted reserve’ design application, the ‘nodal reserve’ application in case study area two has the potential to contribute the following to the Regional Forest Agreement’s objectives:

- The viability of the reserved grassy *E. viminalis* community would be enhanced.
- The impact of disturbances from adjacent land on the reserved grassy *E. viminalis* community would be reduced.
- Lower management attention requirements would lead to reduced management costs.

Potential consequences

In addition to the potential consequences of the ‘restricted reserve’ design application, the ‘nodal reserve’ application in case study area two has the potential to increase the amount of incidental reservation of other forest communities and consequently increase the impact on available standing wood volume. This would involve a loss of an additional area of about 550 hectares of provisional coupes containing 10 000 cubic metres of sawlogs and 100 000 cubic metres of pulpwood. Areas suitable for intensive management would be reduced by a further 280 hectares.

5.6.7 ‘Extensive reserve’ application: case study area one

In case study area one the ‘extensive reserve’ application is designed to protect in one large reserve forest communities and old growth for which the JANIS criteria require protection of 100 per cent of their extent on public land, that need large extents on public land to meet the JANIS criteria, or that are of limited distribution in Tasmania. It also reserves endangered species in the area and some National Estate values (see ‘extensive reserve’ approach, Map 5.6).

Potential contribution

In addition to the potential contributions of the ‘nodal reserve’ design application, the ‘extensive reserve’ design application in case study area one has the potential to contribute the following to the Regional Forest Agreement’s objectives:

- All known locations on public land of the two endangered species, *Epacris limbata* and *Galaxias fontanus*, would be reserved.
- All indicative National Estate values in the area for natural landscapes, old growth, centres of endemism, species at the limits of their range, and species diversity and richness would be protected.



- It would contribute to meeting the JANIS criteria by reserving 8620 hectares of old-growth *Eucalyptus amygdalina* on dolerite and 2760 hectares of *E. tenuiramis* on dolerite.
- The values in the study area that require 100 per cent reservation under the JANIS criteria would be fully reserved.
- Some values in good condition on sites of good quality and with improved protection from threatening processes would be reserved.
- The impact on economic values in other parts of the region would be reduced by reserving many values in one area rather than across the region.
- The likelihood of the reserved forest communities' values persisting over time would increase because the communities would be more resilient to disturbances from adjacent areas.
- Reserve management costs would be reduced relative to those applying under the restricted and nodal applications.

Potential consequences

In addition to the potential consequences of the 'nodal reserve' design application, the 'extensive reserve' design application has the following potential consequences for the Regional Forest Agreement's objectives:

- It would reserve some forest communities in the area—for example, *Eucalyptus amygdalina* on dolerite and *E. obliqua* wet—that, for representation reasons, would be better reserved in other IBRA bioregions.
- Extensive areas of low biophysical naturalness would be reserved.
- The area of provisional coupes would be reduced by a further 10 660 hectares. This results in a decrease in standing volume of about 147 000 cubic metres of high-quality sawlog and 900 000 cubic metres of pulpwood in addition to the decrease seen with the 'nodal reserve' design application.
- Areas with medium to high potential for intensive management would be reduced by a further 2900 hectares.
- There would be potential to limit road access to some provisional coupes.

5.6.8 'Extensive reserve' application: case study area two

In case study area two, the 'extensive reserve' application reserves all but one occurrences of grassy *Eucalyptus viminalis* forest in one consolidated area linked to the nearby Ben Lomond National Park; the exception is the isolated patch in the south of the study area (see approach 1, Map 5.7).



Potential contribution

In addition to the potential contributions of the ‘nodal reserve’ design application, the ‘extensive reserve’ design application in study area two has the potential to contribute the following to the Regional Forest Agreement’s objectives:

- The viability of the grassy *E. viminalis* forest community would be enhanced by reserving it in a naturally occurring matrix with other forest communities.
- Adequate corridors connecting the additional reservation with Ben Lomond National Park would be provided and existing informal reserves would be incorporated.
- The range of forest communities would be increased and the altitudinal gradient would be reserved.

Potential consequences

In addition to the potential consequences for the ‘nodal reserve’ design application, the ‘extensive reserve’ design application has the following potential consequences for the Regional Forest Agreement’s objectives:

- Additional areas of two forest communities that are of commercial importance—*E. delegatensis* dry and *E. delegatensis* wet—but do not require further reservation to meet the JANIS criteria would be reserved.
- A further 500 hectares of provisional coupes containing about 3000 cubic metres of sawlogs and 40 000 cubic metres of pulpwood would be reserved.
- The area of moderate to high potential for intensive management would be reduced by a further 70 hectares.

5.7 Effective management systems and processes

In developing approaches to a comprehensive, adequate and representative reserve system, it is important to recognise that many conservation values will not be fully protected in dedicated or informal reserves. Credible and cost-effective systems and processes for sustainably managing forest lands outside the reserve system (multiple use public lands and private lands) are therefore an important component of achieving a comprehensive, adequate and representative reserve system for forested lands in Tasmania.

5.7.1 Ecologically sustainable forest management

The recommendations in the final report of the Expert Advisory Group on Ecologically Sustainable Forest Management (PLUC 1997a) provide the broad framework within which decisions and commitments in relation to ecologically sustainable forest management would be negotiated for the Regional Forest Agreement. The number, complexity and scope of the recommendations are great, ranging from the commitment and policy framework to planning processes, arrangements for implementation, monitoring and compliance, and review and improvement. Each recommendation is being assessed in detail by the Tasmanian and Commonwealth Governments in terms of priority, acceptability and potential cost.



This report does not discuss any approaches for dealing with the recommendations of the Expert Advisory Group on Ecologically Sustainable Forest Management. Both Governments recognise, however, the importance of ecologically sustainable forest management: it will be an integral component of the Tasmania–Commonwealth Regional Forest Agreement.



Table 5.18 Contributions of the restricted, nodal and extensive reserve design applications

(hectares)

Value	Area of public land required to meet JANIS criteria		Contribution of ‘restricted reserve’ approach		Contribution of ‘nodal reserve’ approach	
	Pre-1750	Old-growth	Pre-1750	Old-growth	Pre-1750	Old-growth
Study area one						
<i>E. amygdalina</i> coastal	21 160	11 438	0	0	0	
<i>E. amygdalina</i> on dolerite	23 575	12 504	920	835	1 526	
<i>Callitris rhomboidea</i>	530	130	50	50	28	
<i>E. delegatensis</i> dry	0	7 790	210	185	297	
<i>E. delegatensis</i> wet	0	11 770	175	170	224	
<i>E. globulus</i> grassy	4 440	226	30	30	0	
Tall rainforest	0	16 510	0	0	0	
<i>E. obliqua</i> dry	1 820	9 060	5	5	51	
<i>E. obliqua</i> wet	14 960	21 170	60	50	63	
<i>E. pulchella</i>	18 905	29 164	5 060	4 505	5 596	
<i>E. tenuiramis</i> on dolerite	0	1 100	90	80	81	
<i>E. viminalis</i> grassy	34 985	7 960	65	15	64	
Total area	120 375	128 822	6 665	5 925	7 930	
Study area two						
<i>E. delegatensis</i> dry	0	7 790	0	0	643	
<i>E. delegatensis</i> wet	0	11 770	0	0	788	
<i>E. viminalis</i> grassy	34 985	7 960	969	0	969	
Total area	34 989	27 520	969	0	2 400	

6 Securing outcomes for the Regional Forest Agreement

This chapter discusses matters that are essential to securing durable outcomes for the Tasmania–Commonwealth Regional Forest Agreement.

6.1 Certainty

The 20-year Regional Forest Agreement will form the basis for the long-term ecologically sustainable management of Tasmania's forests, a competitive and efficient forest industry, and protection of environment and heritage values. Many interested parties consider it essential that there be a mechanism that offers a reasonable level of certainty that independent action on the part of either the Commonwealth or the Tasmanian Government will not lead to the Agreement being broken.

Both Governments will pursue options for complementary legislation to enhance the certainty of the Regional Forest Agreement. The form of this legislation is being considered. A degree of certainty will also be provided if the Commonwealth and Tasmanian Governments meet their respective legislative requirements (see Section 6.5) through the final Agreement and the RFA process in general; for example, the studies, assessments and public consultations conducted for the Agreement must be consistent with the *Environment Protection (Impact of Proposals) Act 1974*.

It is expected that, for any future forest-based industrial development proposal that requires a Commonwealth decision, those elements of the proposal that are covered by the Regional Forest Agreement will not require environmental impact assessment in accordance with Commonwealth legislative obligations. In determining whether a Commonwealth assessment is required, full consideration will be given to past assessments, including the Regional Forest Agreement, and any relevant State assessments.

The Tasmanian Government provides security and certainty for public land and resource access by the forest industry through the *Forestry Act 1920* and by the mineral industry through the *Mining (Strategic Prospectivity Zones) Act 1993*. Its intention is that, within the scope of the legislation governing the Resource Management and Planning System, new wood-supply proposals that arise during the currency of the Regional Forest Agreement will not require assessment unless they are beyond the scope of the Agreement or significant and unforeseen changes in circumstances arise.

6.2 Elements of the Regional Forest Agreement

The Tasmania–Commonwealth Regional Forest Agreement will have a number of important characteristics:

- It will clearly describe the commitments of both Governments.
- It will clearly delineate responsibilities for implementing specific commitments and it will provide timetables and milestones.
- It will provide for a review of both Governments' performance every five years.

Governments will make commitments in the Regional Forest Agreement to actions that include the following:

- agreement to the means by which the two Governments will pursue ecologically sustainable forest management systems and processes;
- defining and describing the means for conserving those areas needed to form a comprehensive, adequate and representative reserve system;
- a statement of strategy for the management of forest products and other uses;
- operational mechanisms for the Agreement;



- guidance for implementation of the Agreement, including review mechanisms, monitoring and reporting provisions, funding agreements, data agreements, and mechanisms for continuing public participation and consultation.

The East Gippsland Regional Forest Agreement illustrates how these and other elements have been set out in an agreement. Under clauses 1(d) and 1(e) of the Scoping Agreement, the Commonwealth is required to treat each regional forest agreement in a consistent manner, making exceptions only in exceptional circumstances.

6.3 Monitoring, reporting and accreditation

For the Tasmania–Commonwealth Regional Forest Agreement to satisfy the requirements of clauses 4(c), 4(h) and 4(i) of the Scoping Agreement, it must

- accredit codes of forest practice, including the process for continual improvement of those codes and other management arrangements for forests within RFA boundaries (clause 4(c));
- identify performance indicators and develop monitoring arrangements to enable a detailed assessment of and report on the indicators and the performance of the Agreement every five years (clause 4(h));
- identify a mechanism for updating the Agreement in the light of significant new information or exceptional circumstances (clause 4(i)).

The requirements of clause 4(c) will be met through action agreed by both Governments in the Regional Forest Agreement, taking into account the final recommendations of the Expert Advisory Group on Ecologically Sustainable Forest Management.

The requirements of clause 23 of the Scoping Agreement—that before signing the Regional Forest Agreement both Governments will identify exceptional circumstances that could significantly influence the RFA outcomes and that would require reassessment and amendment of the Agreement before its due expiry date—will also be met through agreed actions and outcomes, as expressed in the Agreement.

6.4 Woodchip export licences

The 1996 Export Control (Wood Chips) Regulations provide that from 1 January 2000 woodchip exports will be permitted only from areas covered by a regional forest agreement.

Subject to the passage of amendments to the relevant regulations under the *Export Control Act 1982*, the Commonwealth will ensure that no controls under that Act apply to the export of hardwood woodchips or unprocessed wood from a region for which a regional forest agreement is in force. The Commonwealth will seek passage of the relevant amendments by 30 June 1997.

6.5 Commonwealth and State legislative requirements

The Regional Forest Agreement will be a memorandum of understanding between the Commonwealth and Tasmanian Governments that expresses their obligations in relation to forests in Tasmania.

6.5.1 Resource management

Tasmania has obligations under State legislation (see Section 2.1) that form part of the Resource Management and Planning System. The System is designed to allow decisions affecting Tasmania's environment, including its natural resources, to be made in accordance with a set of objectives for



sustainable development. These objectives, known as the Objectives of the Resource Management and Planning System of Tasmania, are common to all legislation within the System; for example, the *Land Use Planning Approvals Act 1993*, the *State Policies and Projects Act 1993*, the *Environmental Management and Pollution Control Act 1994*, and the *Historic Cultural Heritage Act 1995*. The Regional Forest Agreement will satisfy these objectives as far as is practicable.

Under the *Forestry Act 1920* Tasmania has obligations relating to the supply of high-grade eucalypt sawlogs and approval of proposed tenure changes to lands on the Register of Multiple Use Forest Land and the Register of Deferred Forest Land. In relation to Deferred Forest Land, schedule 1 of the Act states that 'decisions on permanent exclusion of wood-production from Deferred Forest Land are not to be made until productivity increases have been achieved that will take the sustainable yield of eucalypt veneer and eucalypt sawlog beyond 317 000 cubic metres a year.'

Under the *Mining (Strategic Prospectivity Zones) Act 1993* Tasmania has statutory obligations relating to the approval of proposed changes in the land tenure status of Crown land in Strategic Prospectivity Zones (see Section 3.2.6).

6.5.2 Environmental impacts

The Commonwealth Government's proposal to enter into a regional forest agreement with Tasmania was referred to the Commonwealth Minister for the Environment, in accordance with the administrative procedures of the *Environment Protection (Impact of Proposals) Act 1974*. These procedures require the Minister to determine whether preparation and public review of an environmental impact statement or a public environment report are required to satisfy the object of the Act. The Minister is required to provide this advice before the Regional Forest Agreement is finalised. The public consultation process for the Regional Forest Agreement has been designed to be consistent with the requirements of the Act. The relevant Tasmanian legislation is the *Environmental Management and Pollution Control Act 1994*. The assessment procedures and arrangements for public consultation for the Regional Forest Agreement have been designed to meet the requirements of this Act.

6.5.3 The National Estate

In accordance with section 30 of the *Australian Heritage Commission Act 1975*, the Commonwealth Government's proposal to enter into a regional forest agreement with Tasmania was referred to the Australian Heritage Commission for comment. The Commission is required to provide its comments on the National Estate in the process of finalising the Regional Forest Agreement. The joint assessment of National Estate values resulted in technical information on the distribution and extent of indicative National Estate values in Tasmania (see PLUC 1997c).

Advice on the National Estate

The Australian Heritage Commission has statutory responsibility for providing advice on proposed actions that might adversely affect National Estate places in Tasmania, including places contained in the comprehensive, adequate and representative reserve system or in a listed place. In the context of the Regional Forest Agreement, the Commission could make provision for delegating preparation of section 30 advice for National Estate listed places under the *Australian Heritage Commission Act 1975* to an appropriate Tasmanian body.

National Estate listings from the RFA process

In relation to its statutory responsibilities for listing places on the Register of the National Estate, the Australian Heritage Commission will take into account the overall assessment of values and the levels of protection for these values embodied in the Regional Forest Agreement. It is expected that the Regional Forest Agreement will contain a jointly agreed process for delineating places for listing.

In finalising the Regional Forest Agreement, the Commission considers that where National Estate values are adequately protected regionally through reservation or other measures, other areas containing those values will generally not be listed. However, areas which are agreed to have sensitive values which are not protected may be listed.

6.5.4 World Heritage

Under the *World Heritage Properties Conservation Act 1983*, the Commonwealth may prevent activities that threaten World Heritage values. ‘Identified property’ means areas on and nominated for the World Heritage List and areas subject to a Commonwealth inquiry or declared by regulations to be of cultural or natural heritage. World Heritage values are different to, but in some cases could overlap with National Estate values and from the criteria for the comprehensive, adequate and representative forest reserve system.

The Commonwealth and the States have developed a methodology for assessing World Heritage values in areas covered by a regional forest agreement. The methodology is based on a thematic approach to assessing areas in terms of the extent to which they have ‘outstanding universal value’. Using the agreed methodology, an expert panel has provided the Joint Steering Committee with advice on themes of outstanding universal value relevant to Tasmania’s forests. The expert panel has also considered those places that might contain values that best represent the identified themes (see Section 4.3.7).

It is important to note that the places identified by the panel cannot be regarded as containing World Heritage value. Only places that then meet all the steps in the methodology can be regarded as having World Heritage value. Nomination of places for World Heritage listing would be with the agreement of both governments and take into account social and economic considerations.

6.5.5 Endangered species

The Commonwealth *Endangered Species Protection Act 1992* has schedules of nationally endangered, vulnerable and presumed extinct native species of flora and fauna, endangered ecological communities, and key threatening processes. The Act requires that any effect on scheduled species and communities be taken into account in all Commonwealth actions and decisions. The Act is linked to the *Environment Protection (Impact of Proposals) Act 1974*, such that any action that could threaten with extinction or significantly impede the recovery of a listed species or community may be considered a matter of environmental significance in terms of the latter Act and may require environmental assessment.

The Endangered Species Protection Act also requires that recovery plans be prepared for nationally listed species and that threat-abatement plans be prepared for key threatening processes. The *Tasmanian Threatened Species Protection Act 1995* contains a similar requirement in relation to each species listed in the schedules of endangered, vulnerable or rare flora and fauna. The Tasmanian Act also requires a listing statement for each species, detailing its conservation status, threats and management objectives and actions that need to be taken to manage and conserve the species, as well as consideration of a range of other mechanisms for protecting and managing listed species.

For some listed species in Tasmania, recovery plans have been prepared or are being prepared. For other species, the Regional Forest Agreement will describe a process for the preparation of recovery plans.

6.5.6 Native title

Under the *Native Title Act 1993* the Commonwealth has obligations relating to the protection of native title rights and interests. It is not intended that the Regional Forest Agreement will in any way influence any native title claims that may arise: if any government action to implement the Agreement might affect native title, that action will be taken in accordance with the Native Title Act.

6.6 Private forested land—protection of conservation values

Chapter 3 highlights the integral role of private forested land in Tasmania’s timber industry and in the long-term conservation management of Tasmania’s forest estate. Chapter 4 identifies a number of shortfalls in meeting agreed environment and heritage objectives for a comprehensive, representative and adequate reserve system from public forested land and the probability that some of this shortfall could be made good if conservation values on private forested land were included.

As part of the development of the Regional Forest Agreement, the Tasmanian Government referred to the Public Land Use Commission the task of identifying management options for comprehensive,



adequate and representative reserves on private land. The Commission's Background Report Part F and Proposed Recommendations Report Part II discuss management options for the conservation of values on private forested land (see PLUC 1996c and 1997b).

Private forest owners have identified mechanisms they would like to pursue for protecting conservation values on private land through consultations with the Commission. These include a variety of voluntary agreements—conservation management agreements, stewardship agreements, conservation easements, contracts, purchases, leases, covenants, and so on. Such agreements could take into account the need to consider property rights, the public interest and the financial and legal mechanisms to support voluntary arrangements. The Expert Advisory Group on Ecologically Sustainable Forest Management also made recommendations for the management of private forested land, including a code of agricultural practice. Governments have agreed that there will be no compulsory acquisition of private property. Any contributions of privately owned forests containing identified conservation values to the comprehensive, adequate and representative forest system are to be negotiated with the landowner in question on a voluntary basis. Contributions from private land would be sought only as a last resort, when all other possibilities for maintaining the identified values on public land are exhausted.

The Joint Steering Committee recognises the importance to some private landowners of developing or maintaining long-term commercial opportunities provided by their forest resources. The voluntary nature of any proposed arrangements offers landowners flexibility in this regard.

Clause 14(d) of the Scoping Agreement states that the Commonwealth will provide assistance for meeting specified conservation objectives, including implementation and funding of conservation agreements with private landholders and the purchase of some areas that are important for the forest reserve system.

The Joint Steering Committee proposes the following principles to guide the process of identifying those private forested lands that may contribute to establishing a comprehensive, adequate and representative reserve system for forested land in Tasmania:

- The process of identifying appropriate areas should be based on the forest communities and species assessed for the purposes of the Regional Forest Agreement.
- In developing priorities for various areas, the following should be taken into account:
 - the commercial importance for wood-harvesting and cost consequences of protection;
 - the quality of conservation values of the forest, including the combination of values found, the size, viability and location of the area, and the sensitivity of the values to surrounding land-use activities and current threatening processes;
 - the current management arrangements and future management plans for the area.
- The process of identifying and securing appropriate areas should occur within a defined time frame, starting as soon as possible after the Regional Forest Agreement is signed.
- The landowner must be willing to participate in an arrangement with government.



The arrangements that are devised should ensure long-term active commitment on the part of the landowner, and be simple, transparent, consistent and commercially fair. They should also be sensitive to changes in information and to new information that might influence those conservation values that are important to the comprehensive, adequate and representative reserve system.

A number of administrative matters need to be dealt with before the Joint Steering Committee finalises its approach to private forested land. Among them are the possible need for a legislative framework and associated administrative and financial arrangements for developing voluntary agreements with private landowners. The undertaking of scientific assessments will also be a major task. These matters and other will be dealt with in the Regional Forest Agreement.



7 Overview

The analysis and assessments undertaken by the Joint Steering Committee for this report indicates that the Tasmanian-Commonwealth Regional Forest Agreement has the capacity to provide long-term certainty for

- sustainable levels of wood supply from public forests for industry growth and diversification;
- protection of conservation and heritage values through a comprehensive, adequate and representative reserve system based on national criteria (JANIS criteria);
- access for other uses of forested lands, including mineral exploration and mining, tourism, recreation and other commercial and traditional uses;
- forest management by accrediting ecologically sustainable systems, practices and information.

This certainty, when combined with favourable market and broader economic conditions is likely to strengthen investment confidence in Tasmania's wood-processing industries, encouraging regional employment growth and the further development of an internationally competitive industry. At present Tasmania's forestry industry contributes 7 per cent of Gross State Product (about \$679 million) and the industry employs about 7100 people directly. The export value of the industry is about \$270 million. Long term certainty for Tasmania's forest conservation and heritage values can also be achieved through a comprehensive, adequate and representative reserve system. This reserve system can be developed through a combination of additions to the existing reserve system and using management prescriptions to protect conservation values occurring on unreserved forested land. This combination of reservation and management will provide the basis for the comprehensive, adequate and representative reserve system that will enable long term protection for areas of high conservation and heritage values on forested land. Tasmanian forests play an important role in the conservation of Australia's forested heritage. Tasmania contains seven unique bioregions, it supports a number of rare and vulnerable forest communities and species, and includes an extensive World Heritage area of global importance. Tasmania's island status also makes it an important refuge for some forest communities and species. Tasmanian forests also contain a diversity of cultural heritage sites of great scientific value and importance to the community at large. Adequate reservation of areas of conservation and heritage value is critical to the continued existence of these values.

The private forest estate is a significant contributor to Tasmania's timber industry and to the long-term protection of conservation and heritage values. The assessments undertaken by the Joint Steering Committee highlight that many of the national JANIS criteria can only be met through some areas of private forested land. The Regional Forest Agreement has the potential to protect those conservation values identified largely or wholly on private forested lands. The Commonwealth and Tasmanian Governments have agreed that contributions to the comprehensive, adequate and representative reserve system from private forested lands will be determined through a voluntary arrangement with landowners with appropriate government assistance, when all feasible options on public land have been exhausted. The minerals industry is a major contributor to the State economy. It is based on world class deposits and has substantial potential in undiscovered mineral deposits. It currently provides over 40 per cent of the total value of exports. The Steering Committee recognises the importance of secure access to

forested lands for mineral exploration and mining, particularly for Strategic Prospectivity Zones and other identified areas of moderate to high or unknown mineral resource potential. Over the medium term, the development of known mineral deposits, when combined with favourable commercial and economic circumstances, is projected to increase Gross State Product by \$275 million, employment by over 3000 jobs and exports by \$419 million.

The tourism industry also contributes significantly to the State economy and directly employs about one in 20 Tasmanians. The contribution from nature-based tourism is forecast to double within the next 20 years, providing further opportunities for forest-based employment and regional development.

7.1 Current opportunities

The current public and private wood resource provides significant opportunities for expanding and diversifying Tasmania's forest industries. The Joint Steering Committee's evaluation shows that the value of the wood-processing sector could increase from about \$890 million to about \$3 billion by 2020, with employment in the sector increasing by about 30 per cent and exports increasing from \$267 million to about \$1.3 billion. For Tasmania as a whole these opportunities could mean a 12 per cent increase in Gross State Product and about 6700 new jobs.

The current conservation reserve system in Tasmania provides a significant contribution from public land to meeting national criteria for a comprehensive, adequate and representative reserve system for forested lands. The Joint Steering Committee's evaluation shows that the reserve system fully meets the criterion for protecting 15 per cent of the pre-1750 extent of forest communities (the forest community criterion) for 18 of the 50 communities identified for the Regional Forest Agreement. The reserve system also fully meets the national criterion of protecting 60 per cent of old-growth forest (the old growth criterion) for 14 of the 43 communities containing old-growth forest. The current reserve system contains 86 per cent of the high-quality wilderness in Tasmania, of which 69 per cent is in dedicated reserves and 17 per cent in informal reserves. The reserve system also contains examples of 28 of the 29 indicative National Estate values identified during the comprehensive regional assessment.

The Steering Committee evaluated current opportunities for developing a comprehensive adequate and representative reserve system with the aim of negligible social and economic consequences. This was based on identifying suitable areas of unreserved public forested land excluding those areas identified as suitable for timber harvesting (provisional coupes). Seventy five percent of the area shortfall from public forests against the national old growth and forest community criteria can be met from areas outside provisional coupes.

Protection of forest areas outside provisional coupes indicates that an additional seven communities meet the national old-growth forest criterion, taking the total to 21 of 43 forest communities. The approach also meets the forest community criterion for an additional 10 communities, taking the total to 28 of 50 communities. The approach contributes to the old-growth criterion for an additional 20 communities, and likewise the forest community criterion for an additional 20 communities, with some overlap. This approach increases the protection of all indicative National Estate values, resulting in the protection of more than 45 per cent of 27 out of the 29 indicative values.

Reservation of high-quality wilderness areas outside provisional coupes would increase wilderness protection from 86 per cent to 94 per cent with only a small direct impact on long-term wood supply. The Joint Steering Committee recognises that some of these areas coincide with large areas of medium to high mineral potential, and the tenure status of any additional reserves is an important consideration for minerals exploration and possible mining.

Arrangements for conservation on private forested land would be required to address the remaining shortfalls—to meet the forest community criterion 18 of 50 communities are identified, and to meet the old growth criterion 17 of 43 old growth communities are identified.

The Steering Committee has also developed a series of strategic approaches to build on the 'current opportunities' in order to better satisfy economic, social, environment and heritage objectives on public land. As in the 'current opportunities', these approaches are based on a numerical assessment against agreed national criteria and objectives for the Regional Forest Agreement. Other factors such as the viability of reserves, management arrangements and associated costs, will need to be considered when governments finalise the reserve system for the Agreement. The strategic approaches are outlined below.



7.2 Enhanced forest industry opportunities

Intensive forest management by thinning native forests and plantation establishment offers potential for substantial expansion of the forest industry. The Joint Steering Committee evaluated an approach to enhance current opportunities for wood-processing industries by intensively managing 15 per cent of the existing Multiple Use Forests. This approach identified that up to 500 000 cubic metres of high-quality eucalypt sawlogs and veneer logs could be sustainably supplied over the next 20 years from public forests, with further increases in supply thereafter.

These increases in annual wood supply are projected, under the right mix of commercial and industrial circumstances, to increase the value of the wood-processing sector by \$2.3 billion, being an additional 11 per cent on what is projected under current opportunities. Employment in the wood-processing sector could increase by 1955 jobs, a 50 per cent increase on that projected under 'current opportunities'. For Tasmania, this has the potential to increase the Gross State Product by almost a quarter more than that projected through 'current opportunities'. It is also projected to increase State employment by 35 per cent more than that estimated through current opportunities, and export value by 16 per cent. These estimates assume a contribution from private forests identical to that for 'current opportunities'.

Contributions to the comprehensive, adequate and representative reserve system under this approach are the same as those met under 'current opportunities'. The increased extent of intensive forest management outside the reserve system would increase impacts on native forest conservation, heritage and catchment management values. Additional planning and management approval mechanisms would be required to adequately safeguard these values.

7.3 Enhanced protection of old growth and biodiversity

Further enhancement of conservation and heritage values through reservation requires some production forests. The Joint Steering Committee evaluated an approach for better meeting national criteria from all unreserved public forests, including provisional coupes. This approach exhausted the capacity of unreserved public forested land to meet the national criteria. The approach selected coupes of lower wood production before selecting those of higher importance for wood production. An additional 46 000 hectares of forests from provisional coupes was identified to fully meet the national criteria from public lands. Under the assumptions for the analysis, up to 82 500 hectares could be required to reserve identified values. In practice it is more likely to be somewhere between these two estimates.

The approach results in an additional four forest communities fully meeting the forest community criteria, taking the total number to 32 of 50. It also results in an additional five communities fully meeting the old-growth criterion, taking the total number to 26 of 43 forest communities, and a small increase in the protection of indicative National Estate values. Any requirement from private forested land would be the same as for 'current opportunities'.

The approach is likely to have some significant social and economic consequences. It has the potential to withdraw an upper limit of 82 500 hectares of forest from wood production, resulting in a projected loss of forest resource equivalent to 1 to 1.5 million cubic metres of high grade eucalypt sawlogs, and associated reduction of resource equivalent to an estimated 7.6 to 11.3 million tonnes of pulpwood. The immediate economic consequences to the wood-processing sector include a 5.8 per cent reduction in the gross value of production with associated impacts on local and regional employment. Averaged over the next 30 years, this withdrawal in supply results in annual decline of between 30 000 and 47 000 cubic metres of saw and veneer logs, and between 230 000 and 350 000 tonnes of pulpwood.

Over the longer term, economic consequences to the wood processing sector include a 2.5 per cent reduction in the estimated \$2 billion projected increase under current opportunities. Despite these consequences, there could still be increases in employment and Gross State Product under this approach. For the State as a whole, projected employment could increase by about 6232, about 7 per cent less over the next decade than could be achieved under 'current opportunities', and Gross State Product would increase by about \$1.1 billion, about 3 per cent less than could be achieved by 'current opportunities'. These broad and long term projected economic consequences are likely to be uneven with substantial social impacts on some individuals, communities and towns dependent on the forests and wood-processing industries.



7.4 Enhanced wilderness protection

To examine the practical application of the JANIS reservation criteria relating to wilderness, the Joint Steering Committee evaluated an approach for fully reserving all high-quality wilderness on public land. In addition to achieving 100 per cent reservation of all high-quality wilderness on public lands, this approach fully meets the old-growth criterion for one additional forest community relative to ‘current opportunities’, and likewise for the forest community criterion. It also increases the protection of areas containing indicative National Estate values by 51 000 hectares. Any requirement from private forested land would be the same as for ‘current opportunities’.

The approach does have significant social and economic consequences because withdrawing areas from wood production results in the loss of about 3 million cubic metres of high-grade eucalypt sawlog and veneer, and about 13 million tonnes of pulpwood. In addition, the annual supply of special-species timbers would be reduced through protection of about 19 000 hectares, imposing an projected annual loss of at least \$4 million.

The economic and social consequences of this approach on the wood-processing sector and on Tasmania as a whole are broadly similar to those outlined for the ‘enhanced biodiversity and old-growth’ approach. For the State as a whole, Gross State Product is projected to be 4 per cent (\$47 million) lower, employment could be 11 per cent (750 jobs) lower, and exports could be 4 per cent lower (\$29 million) than projected under ‘current opportunities’.

The approaches outlined in this report are not mutually exclusive. The Joint Steering Committee considers that there is significant opportunity to combine elements from the approaches to achieve a balanced outcome that best meet both social and economic objectives and environment and heritage objectives. For example, the approach outlined through ‘enhanced forest industry’ opportunities shows that there is significant scope to establish areas for more intensive management that would provide additional resources for industry. The ‘enhanced old growth and biodiversity’ approach indicates that additional significant conservation values are found in some production forests and these could be reserved with some social and economic costs. Combining elements of these two approaches can build on current opportunities and offers prospects for best meeting the objectives for the Regional Forest Agreement.

A number of statutory or policy provisions will be required to secure the outcomes of the Regional Forest Agreement. These include

- legislation by both governments to enhance the certainty of the Agreement
- changes to extend or enhance the systems and processes for delivering agreed outcomes relating to ecologically sustainable forest management
- arrangements to put in place the comprehensive, adequate and representative reserve system for public and private forests, including those for agreed Commonwealth assistance
- arrangements for no additional approvals under the Tasmanian Resource Management and Planning System, including relevant legislation for those matters covered by the Agreement
- changes to remove Commonwealth export licence requirements
- arrangements for no additional Commonwealth approvals under the *Environment Protection (Impact of Proposals) Act 1974*
- Commonwealth accreditation of agreed data and information relating to the management of Tasmanian forests

- arrangements for agreed administration of both National Estate processes and endangered species protection
- arrangements relating to outstanding World Heritage matters
- arrangements for agreed joint cooperation in research, education, and training

Appendix A

Public participation

Vital to the regional forest agreement process is the provision of information and opportunities for public participation—to encourage discussion, to keep interested people and groups informed of progress and important developments, and to ensure broad community involvement.

The Tasmanian and Commonwealth Governments used the Public Land Use Commission's inquiry process to facilitate the dissemination of information, public participation, and public discussion. In addition, information about important stages in the RFA process was placed in Tasmanian newspapers and the *Weekend Australian* at regular intervals. This appendix summarises the public participation opportunities provided to date.

A.1 Workshops, forums and other consultations

Five major workshops or forums were held during the comprehensive regional assessment process:

- An RFA information forum was held in Launceston on 3 May 1996.
- Environment and heritage assessment methodology workshops were held on 1 September 1996 in Launceston and on 2 September in Hobart.
- Social and economic assessment methodology workshops were held on 7 September 1996 in Launceston and on 8 September 1996 in Hobart.
- An information forum on Aboriginal consultation was held on 19 and 20 October 1996 at Golden Karinya, Hadspen.
- Interested parties were invited to make presentations to the Expert Advisory Group on Ecologically Sustainable Forest Management in Hobart and Devonport on 3 and 5 October 1996 respectively. They were also invited to discuss with the Group their submissions in response to the Group's report—in Devonport, Launceston and Hobart between 8 and 11 December 1996.

Over 200 organisations and individuals attended these workshops, forums and consultations.

A.2 The Internet

All RFA-related information, including Public Land Use Commission inquiry information, has been made available on an Internet home page created for the Tasmania–Commonwealth Regional Forest Agreement (as part of the Commission’s home page). This information is also linked to forest-related pages as part of the Environment Australia home page.

The Internet address is <http://www.del.mtas.gov.au/pluc>

Among the information made available through the Public Land Use Commission’s home page is the following:

- an information sheet series designed to ensure that interested parties are kept informed of important dates, consultation opportunities, publications, seminars, workshops and forums (including advice on matters such as meeting venues and the details and results of discussions);
- reports of consultations;
- the Background Report series, detailing, among other things, the information collected during the comprehensive regional assessment;
- consultancy reports for the comprehensive regional assessment;
- a guide to making submissions related to the Regional Forest Agreement and advice on how to lodge those submissions.

A.3 Published information

- A brochure entitled *How You Can be Involved in the RFA for Tasmania* was released in May 1996.
- Eleven RFA information sheets were released between May 1996 and January 1997. Fifteen hundred copies of each information sheet were printed and sent to individuals and organisations on the Public Land Use Commission’s mailing list.
- A series of Background Reports, forming the primary information base for the Regional Forest Agreement, were prepared and sent to over 1000 individuals and organisations:
 - Background Report Part A—*Inquiry into Areas to be Reserved under the Tasmania–Commonwealth Regional Forest Agreement*—published in July 1996;
 - supplement to Background Report Part A—*Methods for Comprehensive Regional Assessment Projects*—published in August 1996;
 - Background Report Part B—*Unresolved Recommended Areas for Protection*—published in September 1996;



- Background Report Part C—*Environment and Heritage Report* (4 vols)—published in November 1996;
 - Background Report Part D—*Social and Economic Report* (3 vols)—published in November 1996;
 - Background Report Part E—*Assessment of Ecologically Sustainable Forest Management Systems and Processes: preliminary report*—published in November 1996;
 - Background Report Part F—*Mechanisms for Achieving Conservation Management on Private Forested Land: a discussion paper*—preprint released on 13 November 1996, final published in December 1996;
 - Supplement to Background Report Part C—*Environment and Heritage Report* (vol. V)—published in December 1996;
 - Supplement to Background Report Part D—*Supplementary Appendices to Social and Economic Report* (3 vols)—published in December 1996;
 - Background Report Part G—*Assessment of Ecologically Sustainable Forest Management Systems and Processes: final report*—published in February 1997;
 - Background Report Part H—*National Estate Report*—published in February 1997;
 - Margules Groome Pöyry Pty Ltd consultancy report—*Tasmanian Forest Industry Growth Potential to 2010 and 2020: report to the Australian Bureau of Agricultural and Resource Economics on behalf of the RFA Steering Committee*—published in March 1997;
 - Proposed Recommendations Report Part I—*Unresolved Recommended Areas for Protection*—published in March 1997;
 - Public Land Use Commission Proposed Recommendations Report Part II—*Mechanisms for Achieving Conservation Management on Private Forested Land*—published in April 1997.
- Copies of published detailed maps and project reports prepared for the comprehensive regional assessment were made available for viewing at reference centres around Tasmania.



A.4 Integration groups

In September 1996 people and groups interested in the management of Tasmania's forests were invited to participate in the RFA integration process (see Public Land Use Commission Information Sheet no. 9).

Eighteen groups or individuals responded to the invitation and the Public Land Use Commission appointed a number of mentors to provide a conduit between the Steering Committee and these groups and individuals. These groups and individuals were invited to make further submissions outlining the matters they thought worthy of consideration in the preparation of options for the Tasmania–Commonwealth Regional Forest Agreement.

The Steering Committee made available computer facilities and operators to help interested groups and individuals analyse data and do their own integration of data layers, as a basis for developing their submissions to the Steering Committee. Technical assistance and advice were provided whenever requested. The computer facilities available were the same as those used by the Steering Committee in its own integration and analysis of data.

Each of the groups and individuals were provided with sets of detailed maps of information collected in the comprehensive regional assessment. Electronic copies of the information, including data layers, was provided on request.

A.5 Formal consultation periods

Throughout the course of the comprehensive regional assessment and the RFA process, over 50 weeks have been provided for formal public comment on a range of issues and information:

- six weeks for comment on the proposed terms of reference for the Public Land Use Commission inquiry into areas to be reserved under the Regional Forest Agreement;
- six weeks for comment on the information contained in Background Reports Parts A and B;
- six weeks for public comment on the preliminary report and recommendations of the Expert Advisory Group on Ecologically Sustainable Forest Management (Background Report Part E);
- eight weeks for public comment on the information contained in Background Reports Parts C, D and F;
- four weeks for initial feedback on key issues for the integration process;
- six weeks for detailed comments on key issues for the integration process;
- twelve weeks for the submission of detailed options for consideration in the options report and integration process;
- six weeks for public comment on the issues and recommendations put forward in the Public Land Use Commission's Proposed Recommendation Reports I and II;
- six weeks for comments on this report—*Options for the Tasmania–Commonwealth Regional Forest Agreement: a strategic approach*.

On a number of occasions, the period available for public comment on a specific report has overlapped with the period available for comment on other reports released around the same time.

Appendix B

Stakeholder submissions received

The Tasmania–Commonwealth Joint Steering Committee had received 140 submissions in response to this stage of the RFA process. Some of these were long, detailed documents; other were in the form of letters. The Steering Committee appreciates the interest and efforts of all participants.

No.	Submission
1	Aulich, Sue, in Launceston Environment Centre submission, 20 February 1997 (Part 2) pp. 79–80
2	Bicheno Coastal Preservation Society, 17 February 1997
3	Bird Lovers of Black Sugarloaf, 5 February 1997
4	Bird Lovers of Black Sugarloaf, 19 February 1997
5	Break O’Day Umbrella Ratepayers and Residents Association Inc., 20 February 1997
6	Break O’Day Umbrella Ratepayers and Residents Association Inc., 21 February 1997
7	Britton Brothers in conjunction with the Forest Industries Association of Tasmania, March 1997
8	Brown, Doug, in Launceston Environment Centre submission, 20 February 1997 (Part 2) p. 30
9	Brown, Doug, in Launceston Environment Centre submission, 20 February 1997 (Part 2) pp. 51–61
10	Burgess, John, 24 December 1996
11	Cadman, Tim, 6 February 1997
12	Clark, Judy, September 1996
13	Clark, Judy, March 1997
14	Construction, Forestry, Mining and Energy Union, 15 January 1997
15	Construction, Forestry, Mining and Energy Union, March 1997
16	Cronin, Steve, in Launceston Environment Centre submission, 20 February 1997 (Part 2) p. 19

- 17 Cronin, Steve, in Launceston Environment Centre submission, 20 February 1997 (Part 2) p. 45
- 18 Davies, Robert, 12 January 1997
- 19 Deloraine Aboriginal Cultural Association, 24 February 1997
- 20 Dorset Council, February 97
- 21 Dorset Council, March 97
- 22 Dunn, Andy, no date
- 23 Eckhardt, Janet, no date
- 24 Edwards, Angelina, no date
- 25 Emberg, Joan, and Emberg, Duane, in Launceston Environment Centre submission, 20 February 1997 (Part 2) pp. 85–7
- 26 Environmental Students' Society, 30 January 1997
- 27 Ferguson, Fairlie, 14 February 1997
- 28 Fitzpatrick, Ruth, 14 February 1997
- 29 Flowerdale River Catchment Residents, 14 February 1997
- 30 Forest Industries Association of Tasmania, 9 January 1997
- 31 Forest Industries Association of Tasmania, no date
- 32 Forest Practices Board, 13 February 1997
- 33 Forest Protection Society, 19 December 1996
- 34 Forest Protection Society, 6 January 1997
- 35 Forest Protection Society, 16 January 1997
- 36 Forest Protection Society, 21 January 1997
- 37 Forest Protection Society, 4 February 1997
- 38 Forest Protection Society, 7 February 1997 (environment and heritage report)
- 39 Forest Protection Society, 7 February 1997 (social and economic report)
- 40 Forest Protection Society, 21 February 1997
- 41 Forest Protection Society (Meander Resource Management Group), 21 February 1997
- 42 Forests and Forest Industry Council of Tasmania, 28 February 1997
- 43 Friends of the Earth Forest Collective, February 1997
- 44 Giles, Frank, in Launceston Environment Centre submission, 20 February 1997 (Part 2) pp. 82–3
- 45 Gitlings, Sandra, 14 February 1997



- 46 Goldsworthy, Laurie, 9 July 1996
- 47 Goldsworthy, Laurie, 25 February 1997
- 48 Graves, Simon, 14 February 1997
- 49 Great Western Tiers National Park Campaign, 9 January 1997
- 50 Great Western Tiers National Park Campaign, 18 February 1997
- 51 Gunns Veneers in conjunction with the Forest Industries Association of Tasmania, March 1997
- 52 Hamilton, JT, 14 December 1996
- 53 Harris, Wendy, 14 February 1997
- 54 Healey, Wayne, no date
- 55 Henley, JM, in Launceston Environment Centre submission, 20 February 1997 (Part 2) pp. 72–8
- 56 Hillman, Anne, 14 February 1997
- 57 Hobart Walking Club Inc., 3 February 1997
- 58 Homan, Carolyn, 14 February 1997
- 59 Joy, 14 February 1997
- 60 Launceston Environment Centre, 19 December 1996
- 61 Launceston Environment Centre, 15 January 1997 (Part 1)
- 62 Launceston Environment Centre, no date (Part 1 supplement)
- 63 Launceston Environment Centre, 20 February 1997 (Part 2)
- 64 Le Batchelor, Nicole, and Le Batchelor, Peter, 14 February 1997
- 65 Leighton, Sandra, 21 February 1997
- 66 Liffey Valley Forests Association, in Launceston Environment Centre submission, 20 February 1997 (Part 2) pp. 14–18
- 67 Maharoff, Ali, 14 February 1997
- 68 Martin, Roger, no date
- 69 Matthews, IC, in Launceston Environment Centre submission, 20 February 1997 (Part 2) pp. 62–7
- 70 Mattingley, Stephen, 12 January 1997
- 71 Mauger, Warwick, no date
- 72 McDougall, PJ, 14 February 1997
- 73 Meander Valley Council, 20 February 1997
- 74 Mitchell, Chris, 3 February 1997



- 75 Mole Creek Caving Club, in Launceston Environment Centre submission, 20 February 1997 (Part 2) pp. 20–2
- 76 Mount Roland Landcare Group, 7 January 1997
- 77 Murfet, David, and Murfet, Alison, 17 February 1997
- 78 National Association of Forest Industries Ltd, 6 February 1997
- 79 Native Forest Network, 17 January 1997
- 80 Native Forest Network, 21 February 1997
- 81 Neville, Sophie, and Neville, Harry, 14 February 1997
- 82 North Forest Products, 30 January 1997
- 83 North West Walking Club Inc., in Launceston Environment Centre submission, 20 February 1997 (Part 2) pp. 33–42
- 84 Peak Environmental Enterprises and Conservation Centre of Australia, 18 November 1996
- 85 Pedley, Jon, 28 January 1997
- 86 Peninsula Environmental Network, 8 October 1996
- 87 Reedy Marsh Forest Conservation Group, 8 January 1997
- 88 Reedy Marsh Forest Conservation Group, 6 February 1997 (social and economic report)
- 89 Reedy Marsh Forest Conservation Group, 7 February 1997 (environment and heritage report)
- 90 Reedy Marsh Forest Conservation Group, 21 February 1997
- 91 Savage River Caving Club Inc., no date
- 92 Savage River Caving Club Inc., no date
- 93 Sharma, Frances, 14 February 1997
- 94 Sharples, Chris, Dixon, Grant, and Duhig, Nathan, 4 December 1996
- 95 Shields, Marty, 14 February 1997
- 96 Short, Eric, 7 February 1997
- 97 Smiley, George, no date
- 98 Smith, Neil, 7 February 1997 (no. 1)
- 99 Smith, Neil, 7 February 1997 (no. 2)
- 100 Smith, Angela, no date
- 101 South East Forest Protection Group, 18 February 1997
- 102 Southern Forests Community Group Inc., 13 January 1997
- 103 Stainsby family, no date



- 104 Swinsburg, Graham, no date
- 105 Symons, Janance, Fyer, Roy, Kelly, Androo, Keil , Pete, and Morris, Vanessa, no date
- 106 Tarkine National Coalition, 7 February 1997
- 107 Tarkine National Coalition, 28 February 1997 (supplement to 7 February 1997)
- 108 Tasmanian Conservation Trust, December 1996
- 109 Tasmanian Conservation Trust, February 1997
- 110 Tasmanian Conservation Trust (NW), 7 February 1997
- 111 Tasmanian Conservation Trust (NW), 21 February 1997
- 112 Tasmanian Country Sawmillers Federation Ltd, 20 February 1997
- 113 Tasmanian Logging Association Ltd, 19 February 1997
- 114 Tasmanian Minerals Council, 19 December 1996
- 115 Tasmanian Trades and Labor Council, 2 January 1997
- 116 Tasmanian Traditional and Recreational Land Users Federation Inc., 3 December 1996
- 117 Tasmanian Traditional and Recreational Land Users Federation Inc., January 1997
- 118 Tasmanian Traditional and Recreational Land Users Federation Inc., 5 February 1997
- 119 Tengenowa Dreaming, 20 February 1997
- 120 Tengenowa Dreaming, 21 February 1997
- 121 Tourism Tasmania, 31 January 1997
- 122 Warner, Gary, 14 February 1997
- 123 Wilkinson, M and N, received 20 March 1997
- 124 Williams, Carol in Launceston Environment Centre submission, 20 February 1997 (Part 2)
pp. 4–9
- 125 Williams, Carol in Launceston Environment Centre submission, 20 February 1997 (Part 2)
pp. 10–13
- 126 Williams, Carol in Launceston Environment Centre submission, 20 February 1997 (Part 2)
pp. 23–9
- 127 Williams, Carol in Launceston Environment Centre submission, 20 February 1997 (Part 2)
p. 31
- 128 Williams, Carol in Launceston Environment Centre submission, 20 February 1997 (Part 2)
p. 39
- 129 Williams, Carol in Launceston Environment Centre submission, 20 February 1997 (Part 2)
pp. 43–4
- 130 Williams, Carol in Launceston Environment Centre submission, 20 February 1997 (Part 2)
p. 46



- 131 Williams, Carol in Launceston Environment Centre submission, 20 February 1997 (Part 2) p. 47
- 132 Williams, Carol and Brown, Doug in Launceston Environment Centre submission, 20 February 1997 (Part 2) pp. 48–50
- 133 Williams, Carol in Launceston Environment Centre submission, 20 February 1997 (Part 2) pp. 68–70
- 134 Williams, Carol in Launceston Environment Centre submission, 20 February 1997 (Part 2) p. 71
- 135 Williams, Carol in Launceston Environment Centre submission, 20 February 1997 (Part 2) p. 81
- 136 Williams, Carol in Launceston Environment Centre submission, 20 February 1997 (Part 2) p. 84
- 137 Williams, Carol in Launceston Environment Centre submission, 20 February 1997 (Part 2) pp. 88–92
- 138 Williams, Carol in Launceston Environment Centre submission, 20 February 1997 (Part 2) p. 93
- 139 Williams, Carol in Launceston Environment Centre submission, 20 February 1997 (Part 2) p. 94
- 140 Yuval, no date

Appendix C

Matters raised in submissions: a summary

The public submissions received in response to this stage of the RFA process dealt with a variety of matters. In this appendix they are arranged under the major headings used in the Steering Committee's objectives paper: conservation-related issues; forest uses; industry and social development; and other matters. The numbers in parentheses refer to the submissions listed in Appendix B.

C.1 Conservation-related issues

C.1.1 Existing reserves

- Policy on reserve acquisition and the adequacy of existing reserves should be re-evaluated. (42)

- An audit of existing reserves is required to determine their viability, appropriateness and effectiveness. (33, 34, 41, 74, 82, 87)
- The boundaries of current reserves need to be rationalised because some forest communities may be over-represented. (31, 112)
- Boundary rationalisation would improve reserve management. (112)
- The boundaries of current reserves should be reviewed, to determine whether existing areas should be enlarged or limited. (42)
- Existing dedicated reserves should be accepted as the basis on which extensions to meet native forest reservation requirements are determined. (109)
- The cost of maintaining the existing reserve system should be examined. (39)
- The question of whether additional areas are considered for reservation if funds are not available requires further consideration. (42)
- Proposals for new or expanded reserves should be considered only when it is demonstrated that existing reserves can be managed on a sustainable basis and that sufficient funding is available. (14)

Data and methodology

General

- The field assessments were inadequate. (106)
- Additional ground verification is required. (70, 87)
- Not all endangered, vulnerable and rare species have been listed. Further studies are necessary. (110)
- There are considerable data gaps, particularly in relation to the disturbance effects of forestry activities. (99)
- Too much emphasis is placed on threatened species and not enough on preventing other species and communities from becoming endangered or vulnerable. (99)
- In the summary of Background Reports C and D there is bias, discrimination and polarity in the way the industry and conservation groups were portrayed. (88)
- No consideration has been given to size or age in the assessment of species and target groups. (106)
- There are preliminary results only for a number of species. (60)
- The Tasmanian tiger should have been considered. (106)
- Huon pine probably exists in the Sunday Creek – Donaldson River catchment. (106)
- Are *Acacia melanoxylon* communities successional or old growth? (60)
- The data on which the mapping of rainforest ‘pine’ species was done were questioned. (106)
- The King Billy pine figures were questioned. (61, 70)
- *Acradenia frankliniae* should be considered a threatened species. (106)
- The reservation level of *Eucalyptus brookeriana* was commented on. (106)
- There are possible errors in the distribution of *E. brookeriana* – *Acacia melanoxylon* in swamp forests. (42)



- Vascular forest flora that should be given secure reservation status were identified. (110)
- The number of forest communities was questioned. (89)
- The north-east rainforest communities should be recognised as different from those of the north-west. (136)
- The areas of forest communities were questioned. (37)
- Possible errors in the vegetation community mapping were noted. (60)
- There should be no further reservation of the five significant commercial forest communities for sawmillers because of the major socio-economic impact. (31)
- The need for the ‘high’ level of reservation was questioned, as was the adequacy of the data (for example, the number of tree communities—‘too many’) (38)
- The methodologies used to calculate the current extent of forest communities, old growth, biophysical naturalness and disturbance mapping give cause for concern. (89)
- Assumptions made in relation to the data on old growth, the National Wilderness Inventory and forest cover prior to 1750 of forest in reserves that will evolve into old growth at the completion of the 20-year Regional Forest Agreement should be questioned. (33, 34, 40)
- The decision rules and methodologies applied to old growth give cause for concern. (61)
- There is a need to review the old-growth tables in relation to several local species in the Tarkine area. (106)
- There are errors, omissions and distortions in a number of the maps, including forest communities (current extent), old growth, biophysical naturalness, forest resource types, current eucalypt sawlog volume, and native forest eucalypt height potential. (89)
- There are a number of obvious anomalies in the old-growth mapping; further work is required to validate the data. (61)
- There is a need to resolve a number of methodological problems in the data, such as the old-growth data. (87, 89)
- The scale of the maps was too small. (87)
- To determine the balance between reservation and working forests, those (human) communities most vulnerable to change in the timber resource should be mapped. (33, 34)
- A complete inventory of ‘conditional forest’ is needed and it should be mapped and provided as a separate data layer. (88)
- Will the timber-harvesting data be used in determining RFA outcomes? (49)
- The biophysical naturalness rating for the agricultural land adjacent to Burnies Creek was questioned. (49)
- It was asked that a fully attributed biophysical naturalness layer be provided for analysis purposes and that the biophysical naturalness value of those areas that have been selectively logged be reviewed. (61)
- The biophysical naturalness map needs to be amended in relation to Savage River. (106)



Definitions

- The definition of ‘forests’ was disputed because it apparently includes plantations. (61, 63)
- The definition of ‘forests’ is sensible and reasonable. (89)
- Two definitions of ‘rainforest’ have been provided. (96)
- ‘Disturbance’ should be defined. (106)
- The term ‘attribute accuracy’ should be clarified. (61)
- ‘Regrowth’ needs to be defined. (61)

JANIS

- A number of problems with meeting the JANIS criteria were identified. (42)
 - The 15, 60 and 90 per cent JANIS figures should be treated as targets only. (112)
- (i) **Flexibility**
- The need for a flexible approach to determining the reserve system was stressed. (7, 14, 50, 74, 78)
 - The flexibility in the JANIS criteria may mean that other considerations are put ahead of the conservation of biodiversity. (60)
- (ii) **Biodiversity**
- The 15 per cent JANIS criterion should not necessarily have to be met for those commercial forest communities of which large areas exist and that are well represented elsewhere. For these communities wood-flow scenarios should be modelled at 5, 10 and 15 per cent. (82)
 - The 15 per cent JANIS criterion should not be applied to *Eucalyptus regnans*. (51)
 - A minimum of 15 per cent of the pre-1750 forest cover needs to be reserved for each community. (110)
 - The 60 per cent biodiversity criterion should not apply to tall rainforest because large areas exist. (82)
 - For Blackwood, a figure of up to 10 per cent of the current area should be applied. (7)
 - When assessing the biodiversity requirements for the CAR reserve system, the viability of forest communities, flora and fauna species and their genotypes should be considered. (63)
 - Wilderness is a social construct and makes no intrinsic contribution to biodiversity. Areas should remain available for mining and timber production; that is, both conservation and industry can co-exist. (31)
 - The 15 per cent JANIS criterion should be adhered to. (98)
 - The 1750 benchmark used for the JANIS biodiversity criterion was queried because the landscape was extensively modified before that date. (42)
 - A number of problems with the 1750 concept used in the JANIS criteria were detailed. (7, 31)



(iii) Old growth

- The JANIS 60 per cent reserve proposal for old growth was disputed. (74)
- The 60 per cent JANIS criterion for old-growth forest does not adequately taken into account the special features of blackwood and swamp forests. (7)
- The dynamics of old growth should be considered. (74)
- Old growth should be reserved until its values for Aboriginal people have been assessed. (119)
- A reservation level of 60 per cent of old growth will do little to enhance biodiversity. (7, 31)
- Whilst the concept of old growth is useful it should not completely determine reservation options. (99)

(iv) Wilderness

- More consideration should be given to lowland and gently undulating areas as well as actual wilderness experience. (89)
- No further wilderness is warranted. (7, 74)
- The distance grading used in determining wilderness was disputed. (106)
- All wilderness with a wilderness value of 12 or greater should be protected in dedicated reserves. (62)
- The Mt Donaldson – Sunday Creek area needs to be upgraded to high wilderness rating. (106)
- The 90 per cent criterion for wilderness is too high given that the land has been extensively modified for a long time. (42)
- The 90 per cent wilderness criterion should be applied to private land only on a voluntary basis. (82)
- The wilderness concept used by JANIS needs to be treated as a cultural concept. (108)

IBRA and scale

- IBRA should be the basis for regions in Tasmania. (61, 109)
- A promised review of IBRA regions was noted and it was claimed that IBRA has been misrepresented in the reports as subregions. (87, 89)
- The impact of any reserve design must be considered at the local, regional and national levels. (33, 34)
- The location and delineation of reserves to protect high-quality wilderness should be a priority. (108)

World Heritage

- Details on how World Heritage should be integrated into the overall process were provided. (84, 107)
- There is a need to properly delineate and protect World Heritage values.
- ‘World Heritage values’ includes both cultural and heritage values. (40)
- Existing roads in the World Heritage Area should remain open. (117)
- There should be a buffer around world heritage areas. (54)
- The Great Western Tiers should be considered in any consideration of the proposed Western Tasmanian World Heritage extensions. (50)



- There should be no changes to the World Heritage boundary in the vicinity of the Florentine Valley. (50)

National Estate

- Commonwealth responsibilities in connection with the National Estate should be subsumed by the Regional Forest Agreement. (112)
- No private land should be included for National Estate listing without the approval of the landowner. (82)
- The Great Western Tiers National Park Campaign was not represented at the local public workshop on National Estate social values. (49)
- The views of traditional and recreational land users have been misrepresented. Furthermore, one of the problems with heritage assessments is that the cultural values have not been completely assessed. (116, 117)

C.1.3 Reserve design and management

Approaches to a comprehensive, adequate and representative system

- Models for identifying land for the CAR reserve system were outlined. (33, 34, 40, 108, 109, 116, 117)
- In designing the reserves there is a need to ensure that species can survive changes to the environment that are beyond the control of the reserve managers, such as the greenhouse effect. (99)
- Reserve redesign must maintain the sawlog-driven nature of industry. (34)
- There is no need for additional reserves in aggregate. (34, 40)
- In determining the balance between reservation and working forests, consideration should be given to the possible impacts on all forest users. (33, 34)
- It is necessary to determine the extent of forest unavailable due to the requirements of the Forest Practices Code and Forestry Tasmania's management decision classification system. (34)
- Opportunities to protect additional areas of large reserves should be identified. (108)
- Further economic modelling needs to be done to ascertain the potential impacts of creating, and not creating, additional reserves. (11)
- Forest communities that are under-represented in the CAR reserve system should be rehabilitated so that reservation targets can be met. (40, 109)
- Special-species timbers should be raised from seed for areas that need restoration for the CAR reserve system. (96)

Reserve size

- Reserve size affects the viability of species; recommendations that provide for the most extensive CAR reserve system are therefore supported. (63)
- Unreserved and/or old-growth tall forests should be in dedicated reserves of at least 3000 hectares. (63)



Replication/representation

- There is a need for replication of reserves. (63)
- The general principle of representation of communities, species and genetic stock in the CAR reserve system was raised and clarification of how much genetic diversity will be considered was sought. (60)

Buffers

- There should be a buffer zone around World Heritage areas. (54)
- There should be forest integrity buffer zones, which would be outside the reserve and provide protection to high-conservation areas. (87)
- There is a need for buffer zones to protect both core wilderness areas and national park and State reserve boundaries. (106)
- If the CAR reserve system is not large, ‘dedicated’ buffers need to be added, in which no extractive industries may operate. (63)
- Logging should not be allowed adjacent to reserves because this restricts the opportunity for future generations to expand the reserves. (87)
- A precautionary buffer should be built into reserve design. (38)

Land use

- Additional reserves should be in the informal category. (114)
- In designing the reserves, only dedicated/secure reserves should be acceptable. (60, 63, 106, 108, 109)
- The Public Land Use Commission’s 1995 land classification system should be adopted. (116)
- A ‘remote and natural areas’ category is needed to ensure that those areas with high biophysical naturalness are properly reserved. (109)
- Community reserves are needed; this would include those reserves that are important to the community but do not necessarily meet the JANIS criteria. (108, 109)
- The need for continued mineral exploration access to land in all areas was questioned. (94)
- Reserves should be selected on the basis of high conservation value; this should not mean continued access for mineral exploration and mining. (94)
- The concept of multiple land use was disputed. (87, 110)
- The concept of multiple land use was supported. (40)

Management options

- A number of strategies to achieve conservation outcomes—including cross-compliance, securely reserving dedicated reserves, informal reserves, management prescriptions, and nature conservation on private land—were outlined. (109)
- Working reserves (which includes private land holdings) should be implemented to maximise reserve values. (12)
- Roving reserves would permit management of values that change with time. (12)



- How are the management prescriptions going to be provided for a number of species, given that the forestry botany manuals are yet to be completed? (60)
- The management decision classification system needs to be upgraded because there is currently no public input and no boundary security. (87)
- Management regimes should be developed that prescribe actions to protect the biological diversity of the flora and fauna studied. (34)
- Fire management needs to be taken fully into account. (39)
- A number of questions in relation to the spread of fungal disease and weed were raised; possible remedial action, such as restricting plantations to agricultural land and disturbance mapping, was suggested. (60, 61)
- Which agency should have responsibility for managing the reserves? (61, 87)
- It may be appropriate for more than one agency, or indeed community groups, to manage the reserves. (112)
- The importance of land management to the Aboriginal community was stressed. (19)
- Those people who work in the forests should be actively involved in forest management, to assist in achieving sustainable management. (40)
- There should be provision for greater participation of local communities in the conservation and management of areas of public land. (117)

Resources

- The nature and management of reserves need to be taken account of at the design stage. If, because of insufficient resources, an area cannot be managed for the reservation objectives then it should not be reserved. (31)
- We must be able to afford the reserve system and there must be adequate funds to manage it. (14, 15, 113)
- In determining options, consideration should be given to a least-cost option (15, 41), which could consider off-reserve management and reserves under the Forest Practices Code. (42)
- Working forests should return an income to assist in management. (15)
- Management regimes and costs should be identified for forested land in reservation. This requires a determination of reservation goals and compatible use, the staffing of reserves, the infrastructure needs and costs for reserve management, and the social and economic benefits. (33, 34)
- The proposals arising from the Regional Forest Agreement should be at the least cost to Tasmanians. (115)
- It is essential to legislate to guarantee long-term funding for the management of the reserves. (15)

Other

- The way the reserves are to be declared and gazetted was questioned. (60)
- Will the precautionary principle guide land management options and will it apply until all the flora and fauna studies are completed? (60, 60)
- The precautionary principle needs to be applied to the initial selection of areas for the CAR forest reserve system. (99)



- Mechanisms should be established to ensure that there is appropriate conservation in the future. (87)
- Land managers need to accept and work with the wider notions of cultural heritage, which see heritage not simply as precious objects but as incorporating the values, traditions and practices that create those objects and the community's relationships with landscapes and the environment. (117)

C.1.4 Reserve suggestions

- The Tarkine wilderness, the Sumac area and the Lower Wanderer River Valley should be seen as the balance of the informal reserve that extends from Macquarie Harbour to Low Rocky Point in the World Heritage Area. (96)
- An additional 3477 hectares should be included in the Woolnorth IBRA bioregion (in addition to the national parks, nature reserves and State reserves) to protect World Heritage values. (109)
- In the Woolnorth IBRA bioregion an 88-hectare reserve is proposed for Black Bluff for its wilderness value. (109)
- A total of 65 673 hectares is proposed for the Woolnorth IBRA bioregion as remote and natural area reserves. The specific areas are Lavinia, Hunter Island, Three Hummock Island, Duffs Flat, Crayfish Creek, Mt Roland, Asbestos Range, Dip Range, Pruana, Thorpes Plain, Leven Canyon, Old Park, Rocky Cape, Hellyer Extension, Dove River and Redpa. (109)
- In the Woolnorth IBRA bioregion some 39 031 hectares of informal reserves are proposed for inclusion in the CAR system. (109)
- An area of 34 895 hectares of community reserves is proposed for the Woolnorth IBRA region. These areas are at Dial Range, Mt Roland, Mole Creek, Black Sugarloaf, Great Western Tiers, Dazzler Range, Leven Canyon and Reedy Marsh. (109)
- The Tarkine should become a dedicated reserve for wilderness, biodiversity and geodiversity. (107)
- The Tarkine should become a national park. (123)
- The Tarkine should be made a dedicated reserve by means of World Heritage listing, with adequate buffers provided and a number of recommended areas for protection included. (126)
- The Tarkine, Cradle – Central Plateau, South West, Henty River, Mt Heemskirk and Little Henty wilderness areas should be reserved on wilderness grounds. (110)
- Dial Range should be a national park or State reserve on flora grounds. (110)
- A series of protected areas should be declared along the Penguin – Cradle trail. The four reserves proposed are a Dial Range State reserve, a Leven River State reserve, the Black Bluff plateau, and an area south of the Cradle Mountain link road. (83)
- Dial Range, Dip Range, Mt Cripps, Reynolds Falls, the swamp gum area near Smithton, Gog Range, Cam River, Emu River, Blythe River, Donaldson River, Savage River, Mt Black and Mt Dundas should be reserved for old-growth reasons. (110)



- Gunns Sugarloaf should be included in a Dial Range State reserve to ensure viability of its forests and the ‘viewscape’ from Gunns Plains. (128)
- The Gog Range should be protected. (24, 56, 95, 104)
- The current Arthur River Forest Reserve should be extended and designated a nature reserve because of its areas of high biophysical naturalness. (44)
- The swamp areas in Circular Head Forest District should be reserved. (106)
- Reedy Marsh Conservation Park should be declared an IUCN Class II reserve, State reserve or national park in ‘recognition of the natural values, recreation and tourism potential and community values of the area’. (91)
- The Little Henty and Henty wilderness areas should be protected in a dedicated reserve on the grounds of old-growth, biophysical naturalness and wilderness values. (8)
- A number of forest communities on King Island should become dedicated reserves. (127)
- *Eucalyptus brookeriana* should be given dedicated reserve status where it exists in the north-west. (127)
- Areas of the north-west and west coast have been damaged by four-wheel drives. (27)
- The caves and karst of Mt Cripps should become part of the CAR forest reserve system. (91)
- The Flowerdale River catchment is worthy of protection. (29)
- Black Sugarloaf should become a nature reserve or a dedicated reserve. (3, 4, 131)
- A Great Western Tiers national park/Kooparoona Niara national park should be considered. (22, 23, 46, 47, 48, 64, 93, 98, 103)
- The importance of the forests in the Great Western Tiers was noted. (140)
- The Great Western Tiers and Jackeys Marsh area should be part of the forest reserve system. (67)
- Archers Sugarloaf, Warners Sugarloaf, Pats Saddle and Quamby Bluff should be included in a Great Western Tiers national park. (50)
- Areas such as Archers Sugarloaf, Warners Sugarloaf, Pats Saddle and Quamby Bluff, which are adjacent to the proposed Great Western Tiers national park, should be made reserves, to protect and maintain cultural and natural integrity. (53)
- The Great Western Tiers should be considered in any deliberations on the proposed extensions to the Tasmanian Wilderness World Heritage Area. (50)
- The Liffey Valley forests should be an essential part of the Great Western Tiers national park proposal. (66)
- The Great Western Tiers national park proposal was supported and a number of recommendations were put forward, including the following:
 - that the catchment of Dale Brook and Higgs Track be given dedicated reserve status or included in a Great Western Tiers national park;
 - that the catchment of Western Creek and the Western Creek walking track be given protection similar to that recommended for Dale Brook and Higgs Track;



- that the catchment areas over the Mole Creek cave system be given dedicated protection status;
- that the reservation status of the conservation area or protected area on the Central Plateau above the Great Western Tiers be upgraded. (120)
- Warners and Archers Sugarloafs and the intervening area should be placed in a dedicated reserve to protect the *Eucalyptus viminalis* damp communities. (125)
- The Jackeys Marsh – Quamby Bluff region of the Great Western Tiers should be protected and perhaps granted national park status. (72)
- The idea of a Great Western Tiers national park was supported—such a park should be linked with other reserves to form a coast-to-coast biodiversity region. (105)
- Mother Cummings Peak should be protected. (93)
- Mother Cummings Peak should be placed in a dedicated reserve to protect the sphagnum moss; the two coupes in the area should be used as a buffer zone. (125)
- Areas such as Hugo’s Peak (Ritter’s Craig) should be placed in dedicated reserves for their rainforest and King Billy Pine communities. (125)
- A Valentines State reserve should be created, incorporating the Old Park recommended area for protection and Valentines Peak. (127)
- The importance of karst and the karst catchment of Mole Creek was stressed. (71)
- Fairy Glade State Reserve should be extended to include more rainforest. (17)
- Dazzler Range State reserve was proposed. (129)
- Holwell Water Reserve should be made a State reserve because it contains flora such as *Allocasuarina spp.* and *Xanthorrea australis*. (17)
- Virginstowe Forest Reserve should be extended to include the wetlands of Gum Scrub Creek. (130)
- Mt Careless Forest Reserve should be extended to include old growth and king ferns. (131)
- Various forest communities in the Furneaux Group of islands should be made dedicated reserves. (139)
- In the Furneaux IBRA bioregion some 4799 hectares of informal reserves are proposed for inclusion in the CAR system. (109)
- A Mt Cameron East national park should be established and it should be larger than the original recommended area for protection. (132)
- A Blue Tier national park should be established, to protect and manage wilderness and biophysical naturalness values surrounding McGoughs Lookout and the Wyniford River. (69)
- In the Freycinet IBRA bioregion 22 000 hectares are proposed for wilderness. These areas are Douglas Apsley, Freycinet, Maria Island, O’Connors Rivulet and Lake Tooms. (109)
- A total of 68 489 hectares is proposed for the Freycinet IBRA bioregion as remote and natural area reserves. The specific areas are Bicheno–Freycinet, Wielangta, Lake Tooms, Cape Pillar, Buckland, Brushy River, Snow Hill, Swan



- River, MacLaines Creek, Cripps Creek, Gibsons Marsh, Spion Kop and the Swanport River. (109)
- In the Freycinet IBRA bioregion some 22 762 hectares of informal reserves are proposed for inclusion in the CAR system. (109)
 - An area of 35 900 hectares of community reserves is proposed for the Freycinet IBRA region. These areas are at Wielangta, Bicheno–Freycinet and the Tasman Peninsula. (109)
 - A Bay of Fires State reserve was proposed to adequately protect the natural, cultural and aesthetic qualities of the forests. (9)
 - A continuous corridor of native forest from Douglas Apsley National Park through to the Freycinet Peninsula should be formed. (2)
 - A McIntyres Beach nature–recreation reserve based on private land is proposed for the protection of the ‘aesthetic coastal area, especially its floristic, ecological and landscape values which will be severely compromised if developments took place’. (5, 133)
 - A nature conservation and recreation reserve bounded by Elephant Pass, St Marys Pass and the highwater mark to the east is proposed. (6)
 - A Wielangta refuge reserve should be created on the basis that it would retain the natural values of one of the last substantially road free areas in the south-east of the State. (101)
 - In the Ben Lomond IBRA bioregion 30 000 hectares are proposed for wilderness reserves. These areas are Avenue River, Ben Lomond, Doctors Peak, Mt William and Storys Creek (109)
 - A total of 56 171 hectares is proposed for the Ben Lomond IBRA bioregion as remote and natural area reserves. The specific areas are Mt Victoria – Rattler Range, Blue Tier, Mt Maurice Plains, Fingal Tier, Mt Cameron, Stony Head, Swain Hill, Waterhouse Protected Area, St Columba Falls, Mt Barrow, Mt Echo and Whiterock Tier. (109)
 - In the Ben Lomond IBRA bioregion some 500 887 hectares of informal reserves are proposed for inclusion in the CAR system. (109)
 - An area of 123 747 hectares of community reserves is proposed for the Ben Lomond IBRA region. These areas are Panama Forest, the Bay of Fires, Avenue River, Ben Lomond Extension, Mt Cameron, Mt Victoria, Blue Tier and Mutual Valley. (109)
 - There should be an extension of Ben Lomond National Park, excluding all private land. The proposed extension is from the Storys Creek road eastward between Ben Lomond National Park and the South Esk River taking in the Castle Carey and Sawpit Ridge Forest Reserves, then northward taking in Tower Hill and the Upper Esk catchment area. (55)
 - A reserve was proposed for the Mutual Valley, in the north-east of the State. The area would join with the Weld and Blue Tier recommended areas for protection and Mt Victoria – Rattler Range. (1)
 - The Scottsdale and Myrtle Grove water supply should be declared a dedicated reserve. (135)
 - The Panama Forest should be classified as a State reserve. (25)



- The Panama Forest State reserve proposal could be extended to include Lone Star Ridge and the Mt Arthur escarpment. (135)
- A Mt Maurice – Mt Victoria national park was proposed, with a connector to link Mt Maurice and Mt Victoria. (136)
- The status of the Waterhouse Conservation Area should be upgraded, so that the area becomes a more secure reserve. (20)
- An additional 563 hectares should be included in the Tasmanian Midlands IBRA bioregion (in addition to the national parks, nature reserves and State reserves) to protect World Heritage values. (109)
- In the Tasmanian Midlands IBRA bioregion a 724-hectare area is proposed for wilderness. (109)
- A total of 65 673 hectares is proposed for the Tasmanian Midlands IBRA bioregion as remote and natural area reserves. The specific areas are Millers Bluff, Maydena Range and the Styx River. (109)
- In the Tasmanian Midlands IBRA bioregion some 11 423 hectares of informal reserves are proposed for inclusion in the CAR system. (109)
- An area of 11 429 hectares of community reserves is proposed at Liffey. (109)
- An additional 95 000 hectares should be included in the Central Highlands IBRA bioregion (in addition to the national parks, nature reserves and State reserves) to protect World Heritage values. (109)
- In the Central Highlands IBRA bioregion 18 000 hectares are proposed for wilderness, are in the Cradle – Central Plateau, Drys Bluff, Mt Field, South West and Tumbledown Creek areas. (109)
- A total of 19 755 hectares is proposed for the Central Highlands IBRA bioregion as remote and natural area reserves. The specific areas are Millers Bluff, Wentworth Hills, Mt Roland, Old Park and the Dove River. (109)
- In the Central Highlands IBRA bioregion some 63 237 hectares of informal reserves are proposed for inclusion in the CAR system. (109)
- An area of 89 053 hectares of community reserves in the Great Western Tiers is proposed for the Central Highlands IBRA region. (109)
- Snug Tiers should be reserved because of the area's important biological resources, the expanding population in the surrounding areas, and the area's reduced potential for sawlog production. (52)
- An additional 91 000 hectares should be included in the D'Entrecasteaux IBRA bioregion (in addition to the national parks, nature reserves and State reserves) to protect World Heritage values. (109)
- In the D'Entrecasteaux IBRA bioregion 11 000 hectares are proposed for wilderness. These areas are the Wellington Range and the South West (109)
- A total of 36 813 hectares is proposed for the D'Entrecasteaux IBRA bioregion as remote and natural area reserves. The specific areas are Maydena Range, Snug Tiers, East Bruny, Southport Lagoon, Judds Bluff, Kemps Creek, the Styx River and Lomas Hill. (109)
- In the D'Entrecasteaux IBRA bioregion some 17 847 hectares of informal reserves are proposed for inclusion in the CAR system. (109)



- A Tasman national park should be created for wilderness, recreation, historical significance, endangered species, habitat protection and scenic values. (86)
- An additional 567 000 hectares should be included in the West – South West IBRA bioregion (in addition to the national parks, nature reserves and State reserves) to protect World Heritage values. (109)
- In the West – South West IBRA bioregion 53 000 hectares are proposed for wilderness. These areas are the Donaldson River, Henty River, Little Henty River, Meredith Range, Mt Heemskirk, Norfolk Range, Savage River, the South West and the Sumac Rivulet. (109)
- In the West – South West IBRA bioregion some 342 935 hectares of informal reserves is proposed for inclusion in the CAR system. (109)
- Tasmania should become a national park. (106)
- The Tasmanian Trades and Labor Council is not so much concerned with the exact allocation of particular land units as with the outcomes for industries: it views the RFA process as more than a division of land between various tenures and jurisdictions. (115)
- No upgrading or further reservation is required in the Mt Barrow area but a number of plant species do not have adequate protection, among them *Acacia axillaris*, *Grevillea* var. *brevifolia* Hook. f, stunted myrtle and waratah. (134)
- Several identified stands of Huon pine should be included in the assessment for the CAR reserve system. (85)
- All *Athrotaxis* sp. rainforest must be included in the CAR reserve system. (50)

C.2 Forest uses

C.2.1 Forestry

General

- The short rotation length limits the number of large logs that can be produced. (10)
- Logging of native forest and plantation should be on a rotation basis of 84 to 240 years for both sawlogs and pulpwood. (61)
- How can the ‘Regional Forest Agreement ... be seen as an objective assessment of an optimum forest management future for the State when the setting of export woodchip quotas and the establishment of an additional pulp mill [are] promoted outside the Agreement process?’ (10)
- A hardwood inventory should be established to enable the annual 300 000 cubic metres of wood to be accounted for. (87)
- The effectiveness of the sawlog industry in terms of whether potential sawlogs are being pulped was questioned. (15, 99)
- A value for the wood in the reserve system that is unavailable for harvesting should be calculated. (39)
- There is a discrepancy in commercial wood-production figures. (60)
- Why was 95 per cent of Tasmania’s forest product imports softwood pulp when Tasmania has extensive softwood plantations? (60)



- Information on sawlog volumes was queried. (68)
- Veneer and sawlog volumes and the pulpwood volume from national parks and reserves were questioned, as was the fact that no volumes have been given for reserves. (110)
- Environmental impact studies should be done when land is converted from forest to agriculture, as a deterrent to land clearance. (18)
- Environmental impact studies must be done to examine the impact of logging operations on native fauna. (77)
- Logging operations should be stopped in the Mother Cummings Peak area because of the old growth and the need to protect King Billy pine. (50)
- Only selective logging should occur in the upper Nile River Valley to ensure that water quality is maintained. (138)
- The boundary of the Savage River Recommended Area for Protection could be adjusted to allow commercial logging to take place along the Pipeline Road. (6b)
- Forestry should be allowed on the Forestier Peninsula but should be restricted to low-lying, unseen areas and be appropriately managed. (86)
- A proposal for a 'Huon Valley regional forest', which would be classified within the Forest Practices Code as a managed resource protected area, was outlined. (101)
- What impact would an influx of hardwood on the world market have on the Tasmanian market? (60)
- There is a need to acknowledge silvicultural practices. (33, 34)
- Private plantation silviculture should be managed for sawlog rather than woodchips and pulp. (61)
- Silvicultural practices such as clear-felling and burning have not been canvassed. (60)
- Native forest silviculture should become the dominant method of extracting the forest resource. (61)
- Inappropriate silvicultural practices need to be implemented to ensure the continuing maintenance of Blackwood. (6b)
- Selective logging of forests should be allowed to continue. (112)
- Forests should be managed on a selective logging basis rather than clear-felling and burning. (96)
- Concern was expressed at Forestry Tasmania's clear-felling practices as well as its arbitrary designation of largely rainforest with a few eucalypts in the canopy for which clear-felling and burning are prescribed. (76)
- The number of industries that would draw on native old-growth forests was questioned. (60)
- The data used for the growth models, and the models themselves, were questioned. (10)
- The long-term unqualified commitments for wood supply on both Crown land and private forests were questioned and the risks inherent in calculating wood supply were noted. (10)



- Industry, including forestry, should be required to set aside an environmental bond. (106)
- The extension of the right of appeal to include matters relating to the objectives in management plans for public land was opposed. (74)
- Mechanisms for dispute resolution and the avoidance of conflict over forest use should be developed. (33, 34)
- The State should be responsible for the management of forests in accordance with codes of practice. (42)
- There needs to be effective monitoring and enforcement of the Forest Practices Code, independent of Forestry Tasmania. (110)

Sustainable yields

- Forests are not being managed on a sustainable basis and this is resulting in low-quality sawlogs. (110)
- The Tasmanian native forest industry is ecologically unsustainable as well as economically unsound. (110)
- There is a need to raise the sustainable yield of our forests. (33, 34)
- The statement that the amount of sawlogs taken from public land in 1994–99 was 700 000 cubic metres was queried. (60)
- Present logging practices on private land are unsustainable. (60)
- The 300 000 cubic metre quota system should be re-examined. (87)
- The legislated 300 000 cubic metre annual supply of sawlogs from public native forests should be adjusted downwards. (61, 99)
- Native forest firewood should be included as part of the sustainable yield figures. (87)
- Huon pine should be managed on a sustainable basis. (87)
- In relation to preserving special-species timbers, the Forests and Forest Industry Strategy should be adopted with some amendments. (61)
- Blackwood sawlog targets need to be adjusted downwards. (87)
- A proposal was put forward to provide for the supply of high-quality ESFM-certified products for the proposed Huon Valley regional forest, to attract additional high-value adding forest-based to industry the region. (102)
- The figure of 200 000 tonnes of woodchips exported from Burnie was queried. (110)

Plantations

- Plantations are a resource additional to native forests. They cannot replace native forest as a wood resource. (31)
- Plantations are a significant resource for the Tasmanian wood industry and there is potential to expand. (12, 13)
- Plantations should be established only on agricultural or existing cleared land. (61, 99)
- Concern was expressed at the idea of plantation monocultures dominated by such species as *Eucalyptus nitens* and *Pinus radiata*, with little consideration being given to other species, such as Tasmanian oak. (60)



- There is a need to establish blackwood plantations on marginal, cleared farmland. (61)
- The question of plantations is not relevant to the proper management of native forests for timber production. (82)

Converting native forests to plantations

- There is a need to move out of native forests and into plantation-based forestry. (106)
- Logging should occur from existing plantations. (110)
- The conversion of native forest to plantations was opposed, primarily on the grounds of the permanent loss of biodiversity. (110)
- Concern was expressed at any move to substitute some or all native forest sawlogs with sawlogs from eucalypt plantations. (112)
- The strategy to convert native forests in wood-production areas to plantations is flawed because biodiversity will be reduced. (60)
- The conversion of native forests to plantations causes fragmentation of native forests, with severe impacts. (87)
- The conversion of native forest to plantations was opposed. (122)
- The strategic logging of high-conservation areas should cease and plantations should be established only on agricultural land, not by clearing native forest. (87)

C.2.2 Mineral exploration and mining

- There is too much emphasis on mining. (60, 63, 88, 121)
- Mining is not a big employer, the mining royalties are too low, and there should be no mining in the CAR reserve system. (60, 63)
- The impact and threats of mining were noted. (106)
- Mineral exploration and mining should not be allowed in all areas of the State. (94)
- The mineral potential maps in the environment and heritage report are misleading; what is required is a discussion of mineral prospectivity. (94)
- The conclusion that reduced expenditure on mineral exploration and mining during the late 1980s and early 1990s was the result of perceived land-access restrictions may not be valid as other factors may be involved. (94)
- All current and future mineral exploration and mining in the strategic prospectivity zones should be maintained, especially given that the zones are supported by State legislation. (114)

C.2.3 Tourism

- Not enough emphasis has been placed on the importance of tourism. (63, 73, 88, 96, 106)
- Tourism should be considered a strategic industry. (121)
- Further attention needs to be given to tourism in the Regional Forest Agreement, in particular new ventures in areas such as ecotourism. (11, 79, 123)



- The economic value of tourism is likely to double in the period to 2010 and sustainable forest ecotourism should therefore be developed. (110)
- The importance of tourism for increasing employment was stressed. (99)
- Information should be updated to include a further ecotourism operator. (106)
- Why are no employment figures provided for jobs in tourism? (110)
- In the Huon Valley regional forest proposal the potential of tourism was noted. (102)
- Tourism should have some resource security in the Meander Valley. (73)
- A number of recommendations were made to enhance ecotourism and tourism in the Great Western Tiers as well as Tasmania more generally. (79)
- Opportunities exist in tourism and the compatibility of tourism and forestry was noted. (34)
- The conflict between tourism and other industry operations such as mining, the use of log trucks, and other types of recreation was noted. (110)
- The social and economic contribution of forestry than can be derived from unreserved wilderness cannot be replaced other industries such as tourism. (12)

C.2.4 Water

- Many of the social and economic studies are of a superficial nature; for example, the studies on water. (26)
- A number of issues were raised, including the need to adopt the precautionary principle, the need for research into the impact of logging in upper catchment areas and buffer zones, and the impact of aerial spraying on water quality. (61)
- The question of water quality has been overlooked—information is inadequate and incorrect statements are made. More detailed analysis should be done. (87)
- The Forest Practices Code is inadequate to prevent degradation of water by logging operations, and some of the conclusions drawn in the social and economic report are incorrect. (88)
- The provisions of the Forest Practices Code in relation to the use of pesticides are such that they fail to protect the environment. (3, 4)
- Water quality is being compromised because of the failure to maintain appropriate buffer zones when cable logging. (110)
- More consideration needs to be given to the impact of logging on water catchments. (81)
- The heavy metal pollution from the Mt Bischoff mine into the Arthur River should have been noted in the social and economic report. (110)
- Concern was expressed about the use of chemicals in forestry operations and the possible impact of this on water quality. (77, 123)
- Concern was expressed at the use of chemicals in forestry. (29, 110)

C.2.5 Apiculture

- The importance of the apiculture industry was stressed. (88, 102)
- The impact of feral bees on apiculture was noted. (106)
- Logging of leatherwood could affect beekeepers' livelihood. (110)



C.2.6 Firewood

- There is a need to regulate and control the firewood industry. (88)
- The firewood business in Tasmania has the potential for cleaning up the timber left on the forest floor after logging, but in many cases this resource is accessible for only a two-week period. (110)
- Many of the social and economic studies were of a superficial nature, particularly the firewood studies. (26)

C.2.7 Other uses

- Concern was expressed at the extraction of peat and moss. (88, 106)
- Poaching of tree ferns has not been taken into account. (106)
- The cutting of tree ferns from conservation areas and wildlife sanctuaries was opposed. (88)
- Tree ferns should not be salvaged from logged areas. (110)
- A number of other industry initiatives could also be considered; for example, floriculture, pharmaceuticals, chemical and food products, charcoal and fuelwood. (18)
- The importance of the horticulture industry was noted. (102)
- The non-commercial aspects of community use of forests must be given adequate recognition, as should those industries dependent on non-wood values of forests. (115)
- Traditional and recreational users want continued access to public land. (116, 117)
- Walking is an important forest use. (57)
- Grazing in forests was noted. (88)

C.3 Industry and social development

C.3.1 General

- The historical significance of forests to local communities was noted. (41)
- Community and family attachment to forests and the security, lifestyle and sense of pride that forests provide should be recognised. (39)
- The cultural and social values of the forests, trees and plants have not been tabulated. (39)
- The social survey methodology is biased. (96)
- During the integration process further social assessment work should be done to represent the broader community and give more attention to the social impacts of logging. (87, 88)
- The 1996 census data should be used when they become available. (39)
- The public should be informed of pressure from industry or elsewhere that would significantly affect the nature of the forests. (99)



C.3.2 Forest economics

- Forest and forest-product workers should gain a fair share of the benefits deriving from the forest resource. Current tendering processes should also be examined to ensure a fair return to forest workers. (14)
- Returns for the people who grow, harvest, transport and process timber should be greater. (115)
- Little information is provided on the economic returns of forestry to the State, and there is not enough emphasis on the economics of current forestry practices. (68)
- The studies provide little information on the costs and benefits arising from the forest industry and how they are distributed. (10)
- The extent to which economic benefits flow back to local communities has not been fully evaluated. (10)
- Economic policy needs to be the servant of social well-being and not have standing of its own. (10)
- There is a need to identify the beneficiaries of the forest industry, in particular the beneficiaries of any increased availability of timber resource. (99)
- Economic assessments should be carried out for industries other than forestry; for example, tourism. (87)
- A regional computer modelling program should be developed to identify existing and potential economic development based on tourism. (50)
- The reports offered no substantial discussion of how Forestry Tasmania is run economically. (60)
- Forestry Tasmania's operations should be reviewed; the organisation should specialise in selling wood at the best possible return to the State. (87)
- There has been no discussion about Forestry Tasmania's conflict of interest in managing both the wood resource and the non-wood resource; for example, conservation of flora and fauna. (63)
- The way Forestry Tasmania and the Tasmanian Government have economically managed the forest resource was criticised. (61)
- Taxation revenue attributable to the forestry industry should be calculated. (39)
- There is no discussion of the replacement of State-grown timber products in the context that this affects the balance of trade through import replacement. (39)
- There should be a public review of pricing and royalties in the forest industry. Wood-supply agreements should be made public. (86)
- The issue of log allocation and pricing arrangements was discussed in some depth. (88)
- There is no indication of the economics of the commercial thinning trials or how the products are disposed of. (110)
- The royalty rates provided for native forest pulpwood were queried. (110)
- Criteria should be developed to determine economic and commercial forest use. Further details are needed on the criteria being used to establish whether an area of forest will provide a return on investment within a commercial time frame. (18)



C.3.3 Industry development and industry strategy

- The underlying impact of current forest practices on the social and economic health and independence of regional communities has not been identified. This, coupled with the industrial society mentality, means that the Regional Forest Agreement will not improve social and economic outcomes for regional communities. (43)
- The existing forest industry structure should be maintained. (40)
- The impacts of new markets, new technology, new products and innovative harvesting techniques should be considered. (34)
- There is a need to develop strategies for industry development. (33, 34)
- There should be a review of sawlog and veneer log specifications to ensure that maximum returns can be achieved. (87)
- There is a need to build on the State's competitive advantage when marketing Tasmanian timber products. (40)
- An industry development approach must be adopted, recognising the vulnerability of the veneer and special-species industries, the critical importance of the Crown resource for the sawn-timber industry, and the need for a sustainable future for the production of wood fibre. (31)
- The Regional Forest Agreement provides an opportunity to build public confidence in the management of the lands that Tasmania's forest and mineral industries depend on. This confidence is built through having high standards for conservation values as well as having a safe and rewarding working environment for production forests. (115)
- The Regional Forest Agreement should not affect the Forests and Forest Industry Strategy: 'the administration and management systems for forests set in place in the [Strategy] are not open for discussion'. The Strategy and product-level specifications should be 'upheld and the Tasmanian forest industry should be sawlog driven'. (42)
- The Regional Forest Agreement should build on the work done for the Forests and Forest Industry Strategy, with an emphasis on sawlogs. The ability to deliver hardwood sawlogs of a quality that the industry is accustomed to is untested. (14)
- The Regional Forest Agreement process provides an opportunity to look at outcomes for industries, to update the Forests and Forest Industry Strategy, and to complete the implementation of sections of that Strategy that have received less emphasis to date. (115)
- The Wood and Paper Industry Strategy should be fully implemented. (15)
- A wood-labelling and certification process of international standard should be developed and implemented. (15)
- There needs to be a move away from old growth towards establishing and encouraging innovative and economically superior paper-producing industries. (58)
- In determining the balance between reservation and working forests, there is a need to consider the level of dependence on the forest industry and the likely impacts. (33, 34)



- In determining the balance between reservation and working forests it is important to ensure the viability of all sectors of the industry. (33, 34)
- Feasibility studies should be done for options other than clear-fell logging and associated industries. (64)
- There is a need to consider industry restructuring that is ecologically sustainable. (87)
- Woodchip exports should be phased out. (87)
- Woodchip export licensing should be deregulated but complete volume deregulation should not occur. (112)
- There is no need to woodchip native forests or export woodchips from Tasmania. (26)
- Alternatives to pulpwood, such as safe wet-log storage, should be considered. (15)
- The desirability of focusing on the sustainability of existing industry structures was questioned; the emphasis should be on dynamic industry structures able to cope with change. (18)
- The Regional Forest Agreement should have a 20-year forest industry strategy that promotes dynamism and adaptability, rather than more of the same. (18)
- The need to recognise the importance of private land to future industry development in Tasmania was stressed. (78)
- The RFA options should be only those options for which there is a realistic future for industry development. (78)
- Veneers and special-species timber are important in meeting economic goals. (6b, 51, 78)
- Options for alternative community structures and employment opportunities should be investigated, particularly in relation to continuing restructuring of the industry. (98)
- Opportunities exist in areas where there are sustainable, small-scale, labour-intensive forest-based activities such as special-species timbers. (97)
- Industry development options need to consider the impact on local infrastructure; in particular, schools, community assets and services. (33, 34)
- There is a need to ensure community vitality through the provision of an appropriate level of infrastructure. (37)
- Utilisation standards could be improved. (115)
- The importance of downstream processing was stressed. (95)
- Little has been done to promote downstream processing and therefore resource security is needed as well as the removal of sovereign risk for local dedicated downstream processing. (15)
- The Tasmanian plantation-based wood products industry can be expanded by encouraging domestic processing. (12)
- Increasing plantation wood supply should enhance international competitiveness of the Tasmanian wood products industry. (13)
- Local timber processors should be rewarded for maximising the recovery of wood products. (15)



- The importance of downstream processing and the need to create local enterprises were stressed. The importance of downstream processing to service providers and the general community should be recognised, as should the need to encourage investment in technology and research. (33, 34, 40)
- Higher returns to the State will be achieved if investment opportunities can be created in forms of processing that maximise employment. (115)
- There should be greater emphasis on alternative fibres. (26)
- A number of roles the Forests and Forest Industry Council could take in delivering the outcomes of the Regional Forest Agreement were outlined. These include a role in the certification and labelling schemes required for ecologically sustainable forest management, management of the transition from dependence on old growth to dependence on regrowth, and further social and economic assessments. (42)

Special-species timber

- No special or minor species should be sold outside Tasmania unless value has been added. (96)
- There is a need to consider the sustainability of special-species timber rather than focus on current supplies. Options that allow for the development of a more substantial special-species timber sector should also be considered. (10)
- The forests are currently not being managed on a sustainable basis, in particular special-species timbers. (26)
- Wet and mixed forests should be managed on a long-term sustainable basis. This would end logging in rainforests for special-species timbers. (60, 61)
- There should be more emphasis on selective logging with respect to special-species timbers, given that many of the rainforest species are very slow growing. (97)
- The areas in Tasmania where special species timbers occur should be protected. (123)
- A major constraint in the special-species timber industry is the lack of volume to fully develop markets. (6b)
- The supply of high-quality Myrtle is an issue and the Regional Forest Agreement needs to provide access to red Myrtle on basalt soils. (6b)
- Myrtle could be better used in the craftwood and small sawmill sectors if it were more affordable. (110)
- Helicopter logging of Huon Pine should be permitted in areas outside dedicated reserves. (6b)
- There should be more opportunity for the craft industry and small operators to buy special-species timbers at competitive prices. (97)

C.3.4 Employment

- An error in the Meander Valley municipality timber industry employment figures was noted. (88)
- The social and economic report makes no specific mention of employment in the woodchip sector. (26)



- The employment figures for the forest industry were questioned: they do not indicate the true loss of jobs in the industry. (110)
- Percentage figures for employment in all the major industry sectors in Tasmania should be provided. (87)
- A target for increasing employment and the economic return to the State should be developed. An increase in employment of 15 per cent within three years was suggested. (34)
- The need for providing local jobs, especially for the young to give them a future, was highlighted. There should not be a loss of jobs as a result of the Regional Forest Agreement. (33, 34, 40)
- Concern was expressed at the low wages received by forest and forest-product workers. (14, 15)
- All sectors of the forest industry should receive a fair return. (15)
- The livelihood, conditions of employment and quality of life for industry workers and their families are important. (14)
- A safe and rewarding work environment in production forests is necessary. (115)
- The Regional Forest Agreement must deliver security of access for industries. Fairness and equity for forest workers are part of this resource security. (14)
- There is scope to look at equal employment opportunity for women in the forest industry. (87)

C.3.5 Education and training

- The specific nature of skills in the timber industry and the difficulty of transferring these skills to other employment were highlighted. (41)
- A ‘Woodskills’ institute was proposed as an integral component of the Huon Valley regional forest concept. Such a facility would provide needs-based training, facilitate the development of appropriate forest-management, timber-production and value-adding technology, and provide links between Tasmanian designers and local enterprises. (102)
- There is a need for further education and training and to ensure that appropriate infrastructure, such as forest information facilities and school education facilities, exists for this purpose. (113)
- An integrated education and training strategy for the Forest Practices Code was outlined. It would be aimed at personnel involved at all levels of forestry activity associated with harvesting and reforestation, including plantation establishment. (32)
- There are educational opportunities through, for example, the establishment of a centre of excellence in research and forest management at the University of Tasmania. Furthermore, there is a need to increase public awareness of forest management. (34, 40)
- Greater effort is needed to educate the community about conservation values and the need to protect them. (117)



C.3.6 Research and development

- Further research is required to fill the information gaps. (87)
- There needs to be a statewide soil capability survey for forest soils to assist in a meaningful evaluation of the ecological sustainability of Tasmania's forests. (86)
- Further research on fauna is required. (110)
- There is a need for a project that develops ESFM initiatives that can be considered in the development of the Regional Forest Agreement. (87)
- Further studies of the flora and fauna in the Blue Tier region should be done, especially of insect fauna such as Simsons stag beetle. (69)
- Research into the impact of logging in upper catchment areas is necessary. (61)
- There is inadequate information on the numbers of people dependent on forested catchments, especially those drinking untreated water. More detailed analysis is necessary. (87)

C.4 Other matters

C.4.1 Legislation, codes of practice, intergovernmental agreements and other State and National initiatives

- A legislative options package should be developed and incorporated in the Regional Forest Agreement. It should include a time frame for implementation. (87)
- A legislative framework for future forest management, linking both Commonwealth and State processes, is necessary. This could take the form of an intergovernmental agreement, which could be supported at the State level by legislation. (18)
- Legislation is needed to protect forest contractors and their workers from unreasonable and unnecessary exploitation. The legislation should identify compensation mechanisms. (113)
- Section 33AB of the Public Land (Administration and Forests) Act should be reviewed to ensure a fair return to forest workers. (15)
- Small business must be provided with a legislative mechanism for gaining access to a low-cost, fair contract remuneration tribunal. (15)
- The Regional Forest Agreement must contain a commitment to threatened species legislation, native vegetation clearance-control regulations, and land conservation legislation. (109)
- Security of access to resources must be enhanced; this can be achieved only through Commonwealth and State legislation. The Regional Forest Agreement should clearly outline how existing State and Commonwealth legislative requirements will be met during the life of the Agreement. (78)
- There is a need to deliver resource certainty by means of a legislative mechanism that has the approval of both the State and Federal Parliaments. A process for developing the legislation should be determined before finalisation of the Regional Forest Agreement. (42)



- Big business needs to be strictly monitored, to make ecologically sustainable land use the only viable option. This could be achieved through ecologically sustainable land use legislation. (76)
- There should be land clearance legislation. (77, 87)
- Logging and roading in reserves should be legislated against. (87)
- Legislative mechanisms should be available to people who wish to purchase and conserve private land in perpetuity. (87)
- Legislation to guarantee long-term funding for the management of reserves is essential. (15)
- There is a need for a regional mining agreement. (106)
- Existing rights to use water from nearby streams and rivers should be recognised in statutory planning documents. (109)
- Private timber reserves should comply with all planning controls at the State government level, and the provisions relating to who should be able to object to the controls should be extended. Local government should be able to impose planning conditions for a timber-harvesting plan and local residents should be able to formally express their concerns. (73)
- Accreditation of codes of practice is important. (33, 34, 61)
- How will forest practices be accredited in the RFA process? (60)
- The Forest Practices Code should be removed. (6b)
- There should be codes of practice for mining, tourism and other industries. (106)

C.4.2 Financial assistance and compensation

- It was requested that regional development funding be made available in areas where forestry operations are restricted as a result of new reserves. This funding should not be tied to forestry but should be used to develop reserve infrastructure. (11, 50)
- Consideration should be given to compensating the Aboriginal community for loss of both natural and cultural values in forests. (119)
- Compensation for comprehensive, adequate and representative reserves on private land should not be restricted to private landowners; it should be extended to groups such as country sawmillers. (112)
- All individuals and businesses that suffer any loss of productive capacity, on private and Crown land must receive compensation. (31)
- The need for compensation or some other form of inducement for private landowners involved in stewardship was stressed. (14)
- The affordability of compensation, community assistance and other financial incentives and assistance must be considered. (33, 34)
- Money must be made available to ensure that the Regional Forest Agreement can be implemented. (42)
- No further areas should be considered for reservation if funds are not available. (42)



- Proposals for new or expanded reserves should not be considered until it can be demonstrated that existing reserves can be managed on a sustainable basis through sufficient funding. (14)
- In determining the RFA options, consideration should be given to a least-cost option that takes into account off-reserve management and reserves under the Forest Practices Code. (42)
- Adequate funding must be made available. (113)
- Management regimes and costs must be identified for forested land in reservation. This requires a determination of reservation goals and compatible use, the cost of staffing of reserves, the infrastructure needs and costs for reserve management, and the social and economic benefits. (33, 34)
- Funding should be provided to evaluate the final outcomes of the RFA. (61).

C.4.3 Performance indicators and monitoring

- There should be an independent audit of the RFA process. (87)
- There should be capacity to monitor the Regional Forest Agreement, to inspect potential breaches, and to ensure compliance if breaches are confirmed. (109)
- Special reviews in between the five-yearly reviews should be undertaken if necessary. (60)

C.4.4 Time frames

- In relation to involvement of private landowners, the appropriate processes should be implemented within two or three years of the signing of the Regional Forest Agreement. (78)
- Firm reserve proposals should be implemented within six months of the signing of the Regional Forest Agreement. (87)

C.4.5 Other matters

- A number of national initiatives currently under way could affect the Regional Forest Agreement; these need to be considered. (18)
- All other State processes relating to forests should be coordinated through the Regional Forest Agreement. (87)



C.5 Stakeholder options

This attachment briefly discusses and comments on a number of important submissions received by the Tasmania–Commonwealth Joint Steering Committee.

The Southern Forests Community Group - Huon Valley Regional Forest

The submission

The Southern Forests Community Group Inc proposes the creation of a regional forest covering approximately 55 000 hectares of the southern forests currently managed as multiple use forest by Forestry Tasmania, including 15 000 ha of Deferred Forest. The regional forest would have its own business entity, the Woodskills Institute, and be based on continuous forest cover selection-forestry principles—ProSilva.

By applying more site specific forest management practices using the principles of continuous forest cover and selective management espoused by ProSilva and linking it to the provision of resource security to retain and expand the small-scale, high-quality diversified forest-based industry of the Huon, the Group maintains that a national net benefit will be derived.

The ProSilva approach on which the Group's submission focuses originated in Germany and is based on management of mixed species forest. ProSilva emphasises the precautionary principle, promotes long-term holistic valuation and rejects short-term profit maximisation. The SFCG considers that a working forest of approximately 35 000 hectares gross is required with the balance of the 55 000 hectares being set aside for possible future consideration based on the science and markets of the day.

The main elements of the proposal are as follows:

- a community-involved management structure;
- an operational structure of seven forest management teams based on division of the forest into approximately equal are-based units, with each team having a similar complement of machinery for in-forest value-adding, planning and ensuring the productivity of both the forest and the operations;
- ecologically sustainable forest management certification;
- the creation of a Woodskills Institute aimed at improving the skills base;
- the promotion and marketing of forest-based tourism;
- enhancing and maintaining the apiculture industry's access to the leatherwood-rich forests.

The Southern Forests Community Group recommended in their submission that a comprehensive cost–benefit analysis of their proposal for a Regional Forest Concept. The Joint Steering Committee appointed a project steering committee to further investigate the proposals in the SFCG submission in the form of a pre-feasibility study. The feasibility study, which was undertaken by a group of independent consultants is currently being considered by the RFA Joint Steering Committee.



Comment

On the advice of independent consultants, the project steering committee decided that an alternative approach to the management of the proposed regional forest should be modelled. The ProSilva approach was shown to be an inappropriate management system for the wet mixed eucalypt-dominated forests of the area.

In particular the independent review found:

- In relation to silviculture, two independent experts concluded that the proposed management system is inappropriate to the ecology of the ash group eucalypt-dominated mature mixed forest of the southern forests and proposed possible alternative methods of incremental change in management of the forests based on the precautionary principle, extended rotations, and separate management for eucalypts and special timbers.
- that possibility of extreme fire risk combined with very heavy fuel loads creates a fire severity potential that is greater than in any other part of Australia. The main impact of the proposed ProSilva system would be on the ability of crews to suppress wildfires. Fire frequency will increase dramatically if a decision is later made to burn some areas for regeneration purposes in an extensively cut over area.
- Extensive research indicates that there is no likelihood of green premiums for certification of forest management and that certification is likely to be necessary merely to maintain market share, especially for competitive internationally traded products.

Based on these conclusions, an alternative management regime based on the scientific opinions but consistent with the principles of the SFCG's concept of a regional forest was developed. This model was based on a longer rotation of 120 years for the majority of the eucalypt forest, based on clear-fell and burn techniques of establishment and a 200-year selective management regime in approximately 2000 hectares of understorey-rich forest, managed for the understorey. Using this alternative model, a social benefit-cost analysis was conducted based on three scenarios:

- scenario A—the full option
 - a new management region for the southern forest,
 - establishment of the Huon Valley regional forest board as a board governing a trading enterprise,
 - investment in a Huon Valley Woodskills Institute;
- scenario B—scenario A excluding the Huon Valley regional forest board (management remaining with Forestry Tasmania);
- scenario C—scenario B excluding the Woodskills Institute.

The review found that scenario A could cost in the range of \$21m to \$38m over 27 years and that the wood-based industries would need to earn large returns at some future date. Scenario B was found to be cheaper (by a factor of five) but would require a substantially increased industry return. Scenario C



results in a net social cost to Tasmania in the range of \$2.9m to \$5.5m and a net social benefit to the Huon Valley in the range of \$0.2m to \$0.4m.

The Tasmanian Conservation Trust

The submission

The 'conservation option' submission by the Tasmanian Conservation Trust identifies those areas of Tasmania that the Trust considers should be designated as dedicated reserves to be managed principally for nature conservation purposes and analyses how this would meet the comprehensive, adequate and representative reserve system criteria.

The major recommendations of the submission are as follows:

- The comprehensive, adequate and representative reserve system criteria should be applied at the IBRA bioregional level, which the Trust believes would add 50 100 hectares to the area to be conserved.
- Only genuinely secure reserve categories should be equated with dedicated reserves.
- Extensions to existing secure dedicated reserves should be the priority.
- The highest priority should be the proper delineation of World Heritage values.
- The second-highest priority should be the location and delineation of reserves to protect high-quality wilderness values at 100 per cent of protection of wilderness, with wilderness areas being used as the core of newly reserved areas.
- A nature reserve category can be used to protect National Estate and other scientific values.
- Consideration should be given to reserving areas that local community groups think are important.
- Areas should be set aside for rehabilitation, such that the comprehensive, adequate and representative reserve system criteria can eventually be met.
- The Forest Practices Act and its attendant Code and private timber reserves should be replaced with a State Environmental Protection Agency, serviced by the Department of Environment and Land Management.
- The Regional Forest Agreement should extend to all public land the capacity for civil enforcement under the Resource Management and Planning System in matters concerning adherence to management plans with statutory planning requirements.

- The Regional Forest Agreement must include commitment to effective threatened-species legislation, effective native vegetation-clearance control regulations, and land conservation legislation.
- The Commonwealth should make resources available to facilitate maintenance of all genuinely secure reserves and any strategies to achieve them on both public and private land.

The Trust states that the total reserve area required is 1 051 137 hectares which includes 726 073 hectares of forest and 325 064 hectares of non-forest land. The remaining forest in Tasmania excluding the total reserved area is 2 438 335 hectares. The proposal requires reservation of an additional 23 per cent of Tasmania's total forested area. This means that conservation areas and forest reserves would be given the status of dedicated reserves rather than informal reserves.

Comment

The approach taken by governments is to regard Tasmania as one region, applying JANIS criteria with IBRA regions informing consideration of representation of biodiversity.

The Trust's proposals would considerably exceed the JANIS criteria for some old-growth and forest communities.

The social and economic impact of the Tasmanian Conservation Trust's approach is high and does not satisfy many of the identified social and economic objectives. In particular:

- proposed reserves of high-quality wilderness in the north west and southern boundaries areas coincide with areas of high-value and high-volume forest, particularly for high quality sawlog, veneer log and special species timbers.
- although reserves proposed for the eastern half of Tasmania tend to coincide with stands of lower wood production value, the total impact would be significant.
- the Trust's approach to reserve classification would significantly affect the objective of maintaining access for mineral exploration and mining (noting that questions of tenure will be considered in the finalisation of the Regional Forest Agreement).

Gunns Veneers in conjunction with the Forest Industries Association of Tasmania

The submission

This submission provides a description of the eucalypt veneer industry in Tasmania and its importance to the State. The eucalypt veneer industry (which is based on *Eucalyptus regnans*) has sales of over \$10 million dollars a year and provides around 104 direct jobs. Opportunities in the Asian region are noted.

The submission also notes the industry's extreme vulnerability should there be further reservation of *E. regnans* forest (especially in the Florentine Valley) as a result of the Regional Forest Agreement. It argues that there are two threats to the integrity of the *E. regnans* veneer log resource:

- the strict application of the 60 per cent old-growth JANIS criterion;



- any proposal to alter the World Heritage Area boundaries.

In relation to the old-growth JANIS criterion, at present 37 per cent of the existing *E. regnans* old-growth estate is reserved and a further 12 per cent is managed by prescription under the Forest Practices Code. It is argued that the reservation of an additional 11 per cent to meet the 60 per cent criterion would reduce the currently available resource area by nearly 25 per cent. Such a move would not only reduce access to existing stands of mature *E. regnans* but would also limit the ability of the industry to adapt from the traditional old-growth resource to the regrowth based resource.

The submission stresses the importance of applying the JANIS criteria flexibly. This is on the basis that the *E. regnans* community is already extensively reserved in Tasmania and there would be no significant gains for biodiversity if further areas were reserved.

The submission also considers that the World Heritage boundaries in the vicinity of the Florentine Valley should not be amended. Any attempt to expand the World Heritage Area and include the valuable veneer resource in the Florentine Valley would be serious for the industry.

Comment

The issues raised in the submission especially access to the *Eucalyptus regnans* veneer resource were considered in the assessment of both the economic and social and environment and heritage consequences of the approaches developed in this report.

Consideration of flexibility issues is a matter for governments in completing the Regional Forest Agreement.

Britton Brothers in conjunction with the Forest Industries Association of Tasmania

The submission

This submission provides a description of the special-species timbers industry in Tasmania and its importance to the State, outlines the industry's vulnerability under the Regional Forest Agreement process and considers that the JANIS criteria are inappropriate for conserving biodiversity when applied to some special-species timbers.

The industry employs more than 300 people directly in the State and has an annual turnover of \$25 million dollars. It is an important component of the forest-based industry. The lack of volume to fully develop markets is severely constraining the industry.

The submission argues that the JANIS criteria are not appropriate for the blackwood swamps in the north-west of the State. It argues that, because blackwood trees live for only about 120 years and their communities have been formed by disturbance regimes, it is highly unlikely that they are representative of pre-1750 flora.

In relation to myrtle, two matters are highlighted for consideration in the Regional Forest Agreement:

- myrtle occurs in rainforest and rainforest is over-represented when viewed against the JANIS criteria.
- the valuable red myrtle is concentrated on basalt soils and access therefore needs to be provided to sufficient areas for harvesting of myrtle on such soils.



Given the value of the industry the submission argues that a flexible approach should be applied to the JANIS criteria, to ensure that the necessary quantity and quality of logs are available to industry. It also considers that the existing wilderness reserves in Tasmania are sufficient.

Among a number of options outlined are the following:

- a silviculture regime for blackwood that provides for some level of disturbance (rather than a static regime) to ensure the continuing maintenance of the community and a reservation level of up to 10 per cent of current areas to be used for future benchmarking;
- the need for continued access to the supply of high-quality myrtle through the use of existing roading infrastructure;
- helicopter logging including salvage logging of Huon pine in wilderness areas to be allowed outside dedicated reserves.

Comment

The issues raised in the submission concerning special species timbers were considered in the assessment of both the economic and social and environment and heritage consequences of the approaches developed in this report.

Consideration of flexibility issues is a matter for governments in completing the Regional Forest Agreement.

Appendix D

The goal, core objectives and guiding principles for the National Strategy for Ecologically Sustainable Development

The goal of the National Strategy for Ecologically Sustainable Development is

- development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends.

There are three core objectives:



- to enhance individual and community well-being and welfare by following a path of economic development that safeguards the welfare of future generations;
- to provide for equity within and between generations;
- to protect biological diversity and maintain essential ecological processes and life-support systems.

There are five guiding principles:

- Decision-making processes should effectively integrate both long- and short-term economic, environmental, social and equity considerations.
- Where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.
- The global dimension of environmental impacts of actions and policies should be recognised and considered.
- The need to develop a strong, growing and diversified economy that can enhance the capacity for environmental protection should be recognised.
- The need to maintain and enhance international competitiveness in an environmentally sound manner should be recognised.

The core objectives and guiding principles need to be considered as a 'package'. No objective or principle should predominate. A balanced approach is required that takes into account all the objectives and principles to pursue the goal of ecologically sustainable development.

Appendix E

Modelling techniques used for the social, economic, environment and heritage assessments

E.1 Modelling forest use

The Australian Bureau of Agricultural and Resource Economics and Centre for Regional Economic Analysis used models to approximate the economic impacts of the approaches developed in this report.

E.1.1 Modelling the wood-processing sector

To assist in the analysis of industry development and the implications of the Regional Forest Agreement on the wood processing industry, the Australian Bureau of Agricultural and Resource Economics has developed FORUM (the Forest Resource Use Model), a model that can simulate the complex interactions between regional forest resources, wood-processing industries (processing of wood into veneer, sawn timber, manufactured panels, woodchips, and pulp and paper) and final product markets using spatially disaggregated data.

FORUM is a regional linear programming model of production forestry that can measure the direct impacts on local or regional forest-based industries of changes in wood flow over time. It allows the development of the wood processing industry to be simulated, subject to certain assumptions relating to wood resources, industry cost structures and wood markets.

FORUM provides information on the valuation of forest land use for the wood based industries and hence assists in calculating the opportunity cost of changes to forest land use. Spatial representation of FORUM results such as gross value of production and employment allows analysis of the significance of the industry to particular forest regions and an indication of which regions face the greatest changes when wood products, market conditions or industry structure are varied. For this report, FORUM was applied to the hardwood-processing sector.

The economic performance of developing the wood-processing industry over time and possible changes to the industry resulting from changes to resource access are determined using the net present value of land rent. This is the net return to forested land in current dollars, derived at a specific discount rate, for using the forest for the production of forest products. This measure is calculated on a residual value basis; that is, all revenue in excess of costs for managing, harvesting, transporting, processing and marketing logs is accrued to the stumpage level. The net present value of land rent may overestimate the amount an investor would be willing to pay for the land; it represents the social rather than the private value of such use. This is because the net present value may not accrue totally to the land-owner but may be shared with the harvesters, transporters, processors and marketers of the wood. The net present value of land rent does, however, reveal the value society places on a particular piece of forest land for use in the production of forest products. Comparing the net present value of land rent for forest products with that for other forest uses—say, mining or agriculture—allows the economic potential, and hence the international competitiveness, of using wood from selected forests to be assessed.

E.1.2 Modelling the Tasmanian economy

A regional resources model (RRM—Tas) developed by the Centre for Regional Economic Analysis has the ability to examine the economic interdependence of a broader range of industry sectors than FORUM and to estimate the flow-on effects of changes in the forest, minerals and tourism industries.

RRM—Tas is a multi-regional computable general equilibrium model that simulates the economic behaviour of agents in Tasmania and the rest of Australia. Consisting of 38 industries, with an emphasis on forestry, forest products, mining, mineral processing and tourism, the model allows the direct and flow-on effects of economic shocks such as changes in resource availability to be modelled under a range of scenarios, providing results at national, State and regional levels.

A full technical discussion of the model is beyond the scope of this report, but a key feature of general equilibrium modelling is the estimation of substitution between primary factors of production (labour, land, capital and other natural resources) and between sources of materials supply.

RRM—Tas does not model the forest-processing sector at the same level of detail as the FORUM model; rather, RRM—Tas has the capacity to examine the interaction of the forest, tourism and mining sectors and the rest of the Tasmanian and national economy.

E.2 Modelling mineral deposits

The assessment of mineral potential is based on qualitative methodology developed by the United States Geological Survey. Geological units, or tracts, were identified in which the potential for specific types of mineralisation is ranked as high, moderate, low or unknown. The Bureau of Resource Sciences and Mineral Resources Tasmania assessed the ranking for each type of mineralisation using a general



descriptive model in which the geological features of 45 model deposits were compared with those of the tract in question.

In addition to ranking the potential of the tract, the degree of certainty of the assessment was estimated according to the reliability of the geoscientific database for the tract. A map prepared by Mineral Resources Tasmania to show the reliability of data sourced to these models became available to PLUC reference centres in November 1996. Both the geoscientific databases and the models on which the assessments are based are subject to change—sometimes revolutionary change—with the acquisition of new knowledge.

A panel of experts has endorsed the social and economic report's main conclusions about Tasmania's mineral resource potential. The 45 separate mineral deposit models, were ranked by panel members, on the basis of their future importance to the State's mining industry, by giving each one a score out of ten. A weighted score was calculated by multiplying the model score by the level of mineral resource potential for that model, which ranged from 18 for high potential, 6 for moderate to 1 for low. The composite mineral resource potential map (see Map 3.1) shows the highest weighted potential score.

E.3 Modelling social impacts

The methods used to assess the social impacts of the approaches outlined in this report have been based on standard practices used in the field of social impact assessment. As such, they meet the guidelines and principles of social impact assessment set out by the Interorganisational Committee for social impact assessment.

The social data collected during the assessment phase have been analysed and the relationship between forested land and communities has been established. This relationship is shown by mapping the communities where logging contractors live and the forests in which they are working. A geographic information system has been developed to show the link between these communities and land use.

To show how sensitive a community or its catchment is to change in forest-based activity, an index has been calculated for each community in which a logging contractor is based. This index helps decision makers and stakeholders develop those communities priorities for more detailed impact assessment. A range of quantitative and qualitative tools are used to predict the social impacts of change, among them population multiplier methods, impact trees, straight-line trend projections, social indicator analysis and impact display tables. The aim is to identify the impacts on population, industry and employment levels, community infrastructure, and the social and community wellbeing of the affected communities.

E.4 Assemblage modelling

Assemblage models represent the joint distributions of groups of species and in so doing, identify bioregions, communities and ecosystems. Within each bioregion identified by an assemblage model the species composition should be relatively constant and different from that in neighbouring bioregions. The method used does not define assemblages of species in advance but allows them to emerge as a result of analysis, which proceeds in three steps:

- The first step is to define a species composition 'space' in terms of geographic correlations among the species-environmental envelopes (developed during the species modelling project) using principal components analysis.
- In the second step, the Euclidean distance in this space is combined with geographic distance to develop the species assemblages by finding nodal and ecotonal areas. The final step is to map the assemblages as polygons using image segmentation and GIS procedures.

The final product is similar in type to a vegetation map and can therefore be put to similar use in reservation analysis. Since it is compiled from different information, it should, however, be viewed as a complementary rather than alternative resource to the vegetation map. Finally, whilst an assemblage map



best summarises the joint distribution of the species used in the analysis, neither the rare nor widely distributed species will be very influential in its construction and rare species will require separate consideration.

Assemblage maps have been made for most of the functional groups of species including plants, trees, birds and mammals. The potential exists to produce an assemblage map for all species irrespective of functional or taxonomic group. Such a model would provide one approach to mapping the distribution of ecosystems.

This methodology can be applied to physical environmental information to model environmental domains, which are a representation of generalised environmental envelopes based on the same environmental variables as the species-environmental envelopes and using the same analytical process as the assemblage modelling but without the species-modelling analysis. There are many striking coincidences with the species assemblages, but there are also several important differences that may help in reserve system analysis.

E.5 Species modelling

Species modelling has been used as an input to assemblage modelling, to assist in pre-1750 vegetation reconstruction, and to determine the distributions of priority species. The technique used is a module of the CORTEX biogeographic modelling system that was developed by the Tasmanian Parks and Wildlife Service and is derived from BIOCLIM (climate modelling software developed by the Australian National University) and GARP (Genetic Algorithm for Rule Set Production, developed by David Stockwell). Development of the technique has been supported by the National Forest Inventory, the Environmental Resource Information Network and the Australian Nature Conservation Agency. All models are based on abiotic parameters such as climate, topography and geographical substrate. The data for which the models were developed jointly by Tasmania and the Centre for Resource and Environmental Studies (Australian National University). Species records from all available sources provided the biological input to the species modelling. Data from the Royal Australian Ornithological Union *Bird Atlas* were used to model birds, although more detailed data were available for a few species (raptors, owls, parrots, and forty spotted pardalotes).

These models are based on the concept of species environmental envelopes that are implemented as conjunctions of environmental variable ranges (for continuous variables) and variable classes (for categorical variables). Initially, an environmental envelope that encloses all the observations for a species is constructed. Then, one by one, outlying observations are identified by finding the observation that, when removed, maximally increases the certainty of finding the remaining observations. As each observation is removed, new, more compact environmental envelopes are constructed. This process continues until only an inlying core of observations remains.

The result of this process is an ordered set of species-environmental envelopes that reflects an increasing certainty of observing the species. Each grid cell for which a prediction is sought is tested to find the most inlying environmental envelope within which it falls.

The models were evaluated and edited by people with knowledge of the species. Editing, when necessary, was generally restricted to the removal of outlying predictions, which, although having a suitable physical environment for the species, were known to be currently unoccupied because of isolation, size or historical biogeography.

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Glossary

accreditation	acceptance by one government or organisation of data and methods used by another government or organisation
assemblages	collections of populations of different species that live in the same area
biodiversity	<i>see</i> biological diversity
biogeographic region	a region in which the boundaries are determined by vegetation cover and the Earth's physical features and climate. <i>See</i> Interim Biogeographic Regionalisation of Australia
biological diversity	the variety of all life forms: the different plants, animals and micro-organisms, the genes they contain, and the ecosystems they form. Biological diversity is usually considered at three levels: genetic diversity, species diversity, and ecosystem diversity. It is sometimes considered at the level of landscape diversity
clear-felling	a logging system that results in the felling of most standing trees
comprehensive, adequate and representative reserve system	a reserve system based on the principles of comprehensiveness, adequacy and representativeness, as defined in the National Forest Policy Statement, 1992. The reserve system comprises four elements; dedicated reserves, informal reserves, values protected by prescription and private land arrangements.
comprehensive regional assessment	a joint Commonwealth–State assessment of all forest values—environmental, heritage, economic and social—leading to the establishment of a comprehensive, adequate and representative reserve system, agreements on forest management, and the signing of a regional forest agreement
conservation	the protection, maintenance, management, sustainable use, restoration and enhancement of the natural environment
conservation covenant	a voluntary legal undertaking by a landowner, which is registered on the land title, for the purposes of protection of a nominated conservation value of the land



dedicated reserves	reserves where the management regime equates to specific protected area management categories defined by the IUCN Commission for National Parks and Protected Areas— categories I, II, III and IV. Security of tenure, as demonstrated if parliamentary action by Commonwealth, State or Territory governments is required for revocation of the reserve, is fundamental to the establishment and management of dedicated reserves
Deferred Forest Land	forested land recorded on the Register of Deferred Forest Land in accordance with the Tasmanian <i>Forestry Act 1920</i> . The forests are included in sustained yield calculations for wood supply, but logging in them has been deferred pending assessment of conservation and wood-production values
ecologically sustainable forest management	the ecologically sustainable use and management of the forest estate. The National Forest Policy Statement adopts three requirements as the basis for ecologically sustainable forest use and management: maintaining the ecological processes in forests (the formation of soil, energy flows, and the carbon, nutrient and water cycles); maintaining the biological diversity of forests; and optimising the benefits to the community from all uses of forests within ecological constraints
ecosystem	the aggregate of plants, animals and other organisms and the non-living parts of the environment with which these organisms interact
endangered forest community	a forest community whose mapped distribution has contracted to less than 10 per cent of its estimated former range or whose total area has contracted to less than 10 per cent of its estimated former area or where more than 90 per cent of the area of the community is in small patches that are unlikely to persist for more than 25 years
endemic species	native species confined to a specific region or locality
forest	in the context of the Tasmania–Commonwealth Regional Forest Agreement, an area, incorporating all living and non-living components, that is dominated by trees having usually a single stem and a mature or potential mature stand height exceeding 8 metres and with existing or potential projective cover of overstorey strata about equal to or greater than 5 per cent
forest community	a vegetation classification that subdivides a forest type by either structure or understorey floristic composition
Forest Practices Code	this Tasmanian Code sets the standard by which forest practices on public and private land are conducted and is enforced through the provisions of the Tasmanian <i>Forest Practices Act 1985</i>



Forest Resource Use Model	a regional linear programming model designed to measure the direct impacts on local or regional forest-based industries. The Model can provide information on the commercial value of forests and the net returns to the wood-based industries arising from proposed resource use or industry development options
genetic diversity	the variety of genetic information contained in all individual plants, animals and micro-organisms. It occurs within and between populations of species
Gross State Product	is the total market value of goods and services produced in a State within a given period after deduction of the costs of goods and services used in the process of production but before deducting allowances for the consumption of fixed capital. Also referred to as Gross State Product at market prices. For a discussion of the sources and methods used to calculate Gross State Product, refer to the explanatory notes in the Australian National Accounts - State Accounts, Australian Bureau of Statistics catalogue number 5242.0
gross value of production	calculated by taking the unit of quantities of commodities produced and multiplying by the market price. Unless otherwise specified, gross value of production is calculated at the point of sale. For commodities sold domestically, this is at the market point; for exports it is at the point of export
hardwood plantation	plantations of hardwood species; in Tasmania, particularly eucalypts and blackwood
high-quality eucalypt sawlog	category 1 and 3 sawlogs
informal reserves	reserves that contain and are managed for conservation values that unequivocally contribute to the comprehensive, adequate and representative reserve system. Such reserves have a sound basis in legislation (for example, management plans required under legislation), with provision of opportunity for public comment on changes to reserve boundaries and where decisions on their establishment and alteration are politically accountable. In addition, they must be able to be accurately identified (on maps) and be of sufficient area and adequate design to contribute to the continued viability of the values they seek to protect
intensive forest management	a collective term referring to the establishment of plantation forest or the thinning of regrowth forest
Interim Biogeographic Regionalisation of Australia	a bioregional framework delineating 'natural' regions in each State and Territory based on biophysical, environmental and vegetation considerations—for example, climate, soils, landform, vegetation, flora and fauna, and land uses that allow cross-border regionalisation



Interim Forest Agreement	Agreement signed by the Commonwealth and Tasmanian Governments on 16 January 1996, defining those wood-production areas to be set aside from logging until 30 June 1997 while a comprehensive assessment of their wood-production and conservation values was undertaken. At that stage, it was considered that the areas identified in the Agreement included those that might be required for inclusion in a comprehensive, adequate and representative reserve system
JANIS Technical Working Group	a group, comprising conservation scientists and planners from all States, the Northern Territory and the CSIRO, established in 1993 under the auspices of the Joint ANZECC/MCFFA National Forest Policy Statement Implementation Subcommittee (JANIS) to draft national criteria on which to base a comprehensive, adequate and representative forest reserve system in Australia
mill-door value	value of wood at the mill before processing
mill-gate value	value of wood product after processing and before transport to market
Multiple Use Forest	in Tasmania, forested land recorded on the Register of Multiple Use Forest Land in accordance with the <i>Forestry Act 1920</i> , within which Forestry Tasmania is required to make available a statutory volume of eucalypt sawlogs and veneer logs
National Estate areas and places	natural or cultural areas and places that have been entered on the Register of the National Estate or the Interim List by the Australian Heritage Commission for their aesthetic, historic, scientific or social significance or other special value
National Estate values	aesthetic, historic, scientific or social values attributed to places by the Australian Heritage Commission
native forest	any locally indigenous forest community containing throughout its growth the complement of native species and habitats normally associated with that community or having the potential to develop these characteristics
old-growth forest	forest that is ecologically mature and has been subjected to negligible unnatural disturbance such as logging, roading and clearing. The definition focuses on forest in which the upper stratum, or overstorey, is in the late-mature to overmature growth phases
provisional coupes	in Tasmania, areas of Multiple Use Forest and Deferred Forest Land that are potentially harvestable within existing management constraints and Forest Practices Code requirements
pulpwood	logs that are below sawlog quality but are suitable for manufacture of pulp, paper and panel products, including woodchips



rare species	species with small world populations that are not at present endangered or vulnerable but are at risk
Recommended Areas for Protection	in Tasmania, areas of forest types set aside as adequate, secure reserves under the terms of the 1986 Memorandum of Understanding. Many of the original proposed recommended areas for protection are now reserved. Remaining unresolved Recommended Areas for Protection are being resolved through the Public Land Use Commission inquiry process
recovery plan	a comprehensive plan that details, schedules and costs all actions deemed necessary to support the recovery of a threatened species or ecological community
refugia	biological communities or geographic entities that, because of their moderating structural characteristics or physical isolation, or both, provide a sanctuary to which species or groups of species have retreated or have been confined in response to threatening processes, including climatic change
regrowth forest	native forest containing a substantial proportion of trees that are in the younger growth phase and are actively growing in height and diameter. Such forest can contain scattered individuals or small occurrences of ecologically mature, or old-growth, trees
reserve	<i>see</i> dedicated reserves and informal reserves
sawlogs	logs for processing into sawn timber, veneer or poles
Scoping Agreement	Agreement signed by the Commonwealth and Tasmanian Governments on 16 January 1996, establishing the broad parameters for undertaking a comprehensive regional assessment and finalising a regional forest agreement for Tasmania
selective logging	the logging of a selected portion of a stand of timber, usually according to predetermined criteria relating to the intensity of the logging and the nature of the stand remaining after logging
softwood	timber of coniferous trees, irrespective of physical hardness
softwood plantation	plantations of softwood trees, particularly radiata pine
special-species timber management unit	an area of public forest prescribed for the production of special-species timber on a long rotation basis (usually greater than 100 years)
species	a group of organisms capable of interbreeding freely with each other
species diversity	the variety of living species



sustainable yield	for a forest, the maximum level of commercial timber (or product mix) that can be ecologically sustained under a given forest-management regime
thinning	the selective removal of some trees from a plantation so that the remaining trees have a greater opportunity to grow to their maximum potential
threatened species or community	a species or community that is endangered, vulnerable or presumed extinct
threatening process	a process that threatens, or may threaten, the survival, abundance or evolutionary development of a species or ecological community
value-adding	the increase in value to the economy of a natural resource product by manufacturing within the economic area, as opposed to exporting the raw material to be manufactured elsewhere
veneer	a thin slice, or peeling, of wood used to make up panel products
vulnerable species or ecosystems	species or ecosystems that are approaching a reduction in range of 70 per cent or are subject to threatening processes that may cause their loss at the bioregional level
wilderness	land that, together with its plant and animal communities, is in a state that has not been substantially modified by, and is remote from, the influences of European settlement or is capable of being restored to such a state, is of sufficient size to make its maintenance in such a state feasible, and is capable of providing opportunities for solitude and self-reliant recreation
wilderness quality	a measure of differing levels of human impact on the natural environment, as part of a continuum of conditions varying from pristine to urban. Wilderness quality is measured in terms of four variables: remoteness from settlement, remoteness from access, apparent naturalness, and biophysical naturalness



Abbreviations

ABARE	Australian Bureau of Agricultural Resource Economics
AGPS	Australian Government Publishing Service
ANZECC	Australian and New Zealand Environment and Conservation Council
CAR	comprehensive, adequate and representative
CRA	comprehensive regional assessment
CSIRO	Commonwealth Scientific and Industrial Research Organisation
ESFM	ecologically sustainable forest management
FFIS	Forests and Forest Industry Strategy
FORUM	Forest Resource Use Model
IBRA	Interim Biogeographic Regionalisation of Australia
IUCN	International Union for the Conservation of Nature and Natural Resources
JANIS	Joint ANZECC/MCFFA National Forest Policy Statement Implementation Subcommittee
MCFFA	Ministerial Council on Forestry, Fisheries and Aquaculture
PLUC	Public Land Use Commission
RFA	regional forest agreement

