COMPREHENSIVE REGIONAL ASSESSMENT

VICTORIAN STATEWIDE ASSESSMENT OF ECOLOGICALLY SUSTAINABLE FOREST MANAGEMENT

Prepared to support the Central Highlands Regional Forest Agreement process.

TABLE OF CONTENTS

1 INTRODUCTION AND METHODOLOGY

The following is an independently assessed report on ecologically sustainable forest management in Victoria.

The report is only part of the overall assessment of ecologically sustainable forest management and together with community input, it will provide a starting point for Commonwealth and State consideration and determination of sustainable forest management in subsequent Victorian Regional Forest Agreements.

The report examines and assesses the systems and processes underpinning the delivery of ecologically sustainable forest management in Victoria. The report adopts a 'systems' approach rather than seeking to catalogue specific on-ground practices. An analysis of the overall management system and the process elements was undertaken because there are no established performance indicators or benchmarks for ecologically sustainable forest management.

Given that the report is based on the findings of an independent panel which completed a review and assessment of ESFM in East Gippsland, and an assessment of Statewide practices which was independently peer reviewed, the views contained in this report are not necessarily those of the Victorian RFA Steering Committee or of the Commonwealth or Victorian Governments.

1.1 INTRODUCTION

The National Forest Policy Statement (NFPS) (Commonwealth of Australia, 1992a) provides the framework for an assessment of ecologically sustainable forest management:

> 'The Commonwealth-State regional agreement resulting from the [comprehensive regional] assessment will also cover guidelines for all aspects of ecologically sustainable management of the forests in question, taking into account the existing regulatory framework in the States and building on forest management strategies and practices. In this respect, the guidelines will cover, for example, management for sustainable yield, the application and reporting of codes of practice, and the protection of rare and endangered species and national estate values. They may also specify the levels and types of disturbance that are acceptable for a particular forest so as not to adversely affect national estate and other conservation values of that forest'. (Commonwealth of Australia, 1992a, p.25)

Ecologically sustainable management is a key element of current forest policy and underpins the objectives articulated in the National Forest Policy Statement. A working definition is:

> Ecologically sustainable forest management involves integrating commercial and non-commercial values of forests so that the welfare of society (both material and non-material) is improved, whilst ensuring that the values of forests, both as a resource for commercial use and for conservation, are not lost or degraded for current and future generations.

Ecologically sustainable management can be operationally defined as the management of forest on all land tenures to maintain the overall capacity of forests to provide goods, protect

biodiversity, and protect the full suite of forest values at the regional level.

The National Forest Policy Statement proposes to give effect to ecologically sustainable forest management through:

1. Integrated planning processes and management systems.
2. Codes of Practice and environmental prescriptions.
3. Management plans incorporating sustainable yield harvesting practices.
4. Management of native forests outside the reserve system complementing the objectives of nature conservation reserve management. (Commonwealth of Australia 1992a, p.12).

Following completion of the Independent Advisory Group's work on ESFM for East Gippsland, it was recognised that the information and assessments arising from that work related largely to management systems and processes that are relevant in a Statewide context, not just East Gippsland. Consequently, the Commonwealth and Victoria agreed to the development of a Statewide ESFM report and assessment, using as much of the information as possible from the East Gippsland work as a basis for the Statewide report, and to fill any gaps as required.

This document contains the complete Statewide assessment of management systems and processes for achieving ecologically sustainable forest management. The Central Highlands Comprehensive Regional Assessment Report (VicRFASC, 1997a) provides a brief description of

1. the methodology used in the statewide assessment;
2. a statement on ecologically sustainable forest management for the Central Highlands RFA Region;
3. a summary of the outcomes of the Statewide assessment based on five environmental management system components in relation to the ecologically sustainable management criteria; and
4. an overall appraisal of Victoria's forest management systems and processes.

1.2 METHOD OF ASSESSMENT OF STATEWIDE FOREST MANAGEMENT SYSTEMS AND PROCESSES IN VICTORIA

The assessment focuses on the effectiveness of management systems and processes in delivering ecologically sustainable forest management according to a set of principles and criteria (Table 1.1).

Preparation of the Statewide report was undertaken by a Project Management Group consisting of Commonwealth and Victorian officials under the guidance of the Victorian RFA Steering Committee (Figure 1.1). Descriptions and assessment of Statewide management systems and processes were either adapted from systems and processes described for East Gippsland having relevance to the whole state or, in the case of systems and processes not covered in the East Gippsland Report, prepared by the Project Management Group.

The final report was independently reviewed by Professor Ian Ferguson, the chair of the East Gippsland Ecologically Sustainable Forest Management Expert Advisory Group, in accordance with the following terms of reference:

The consultant is required to review and report on a description and assessment of Ecologically Sustainable Forest Management systems and processes in Victoria in relation to ESFM principles and environmental management criteria with particular attention to:

1. *new descriptions and assessments of state-wide management systems and processes not covered in the East Gippsland Report;*
2. *whether the assessments of Statewide management systems and processes properly reflect the East Gippsland Report; and*
3. *an overall appraisal of the Statewide report and identification of the strengths and weaknesses of Victoria's forest management systems and processes.*

1.3 DESCRIPTION OF THE ENVIRONMENTAL MANAGEMENT SYSTEM FRAMEWORK USED FOR THE ASSESSMENT

The ISO 14004 (Standards Australia, 1995) environmental management system framework provided guidance for developing the structure for the assessment of Victoria's forest management systems and processes (Table 1.2). The ISO 14000 series environmental management system operates at an organisation[1] level and has the potential to contribute to an internationally acceptable system for certification of forest management and labelling of forest products in the future.

[1]An organisation can be Commonwealth and State Government organisations or statutory authorities, Governments, private or non-government organisations. For the purpose of the East Gippsland Ecologically Sustainable Forest Management assessment Governments and their administrative structures have been assessed. Private organisations are not included in this assessment.

Table 1.1 Management System Structure and Criteria for Assessment of Ecologically Sustainable Forest Management.

ASSESSMENT CRITERIA	CRITERIA* DESCRIPTION
System design to meet national principles of ecologically sustainable forest management	The planning and management of native forests should: 1. Maintain the full suite of forest values for present and future generations. 2. Maintain and enhance long -erm multiple socio-economic benefits to meet the needs of societies. 3. Protect and maintain biodiversity. 4. Maintain the productive capacity and sustainability of forest ecosystems. 5. Maintain forest ecosystem health and vitality. 6. Protect soil and water resources. 7. Maintain forest contribution to global carbon cycles. 8. Maintain natural and cultural heritage values. 9. Utilise the precautionary principle for prevention of environmental degradation. Notes 1. These principles should be interpreted and applied in the context of the National Forest Policy Statement and other existing policy documents. 2. Definitions contained in the National Forest Policy Statement apply to these principles. 3. Planning and management of plantations should be consistent with the Ministerial Council for Forest Fisheries and Aquaculture document: Forest Practices Related to Wood Production in Plantations: National Principles. * These criteria need to be applied at the appropriate ecological scales.
Public transparency	**Scrutiny:** Type and level of scrutiny - parliamentary, administrative. **Consultation:** Opportunity for public comment, individual stakeholder and group submissions, advisory group involvement in the process, information exchange, provision for feedback in consultation process. **Access to information:** Process for access to information. **Public involvement**: Opportunity for individual stakeholder or community groups to be involved in the decision-making process. **Reporting**: Mechanism for reporting of processes and outcomes for all system criteria.
Monitoring	**Trend measurements**: Process for assessment of change. **Monitoring regimes**: Process for regular monitoring of indicators. **Standards**: Process for designation of quantifiable measures against which the quality or performance of a characteristic or attribute is assessed. **Performance targets**: Process for designation of specified goals. **Performance verification**: Process for ensuring achievement of standards and targets
Compliance	**Audit arrangements, penalties, incentives**: Processes that ensure compliance with stated goals or objectives.
Scientific and technical basis	**Mechanism** for assessing adequacy of information (eg scientific/peer review); **Process** for incorporation of information into decision making process.
Review	**Mechanism** for review, feedback and continual improvement, internal/external, periodicity.

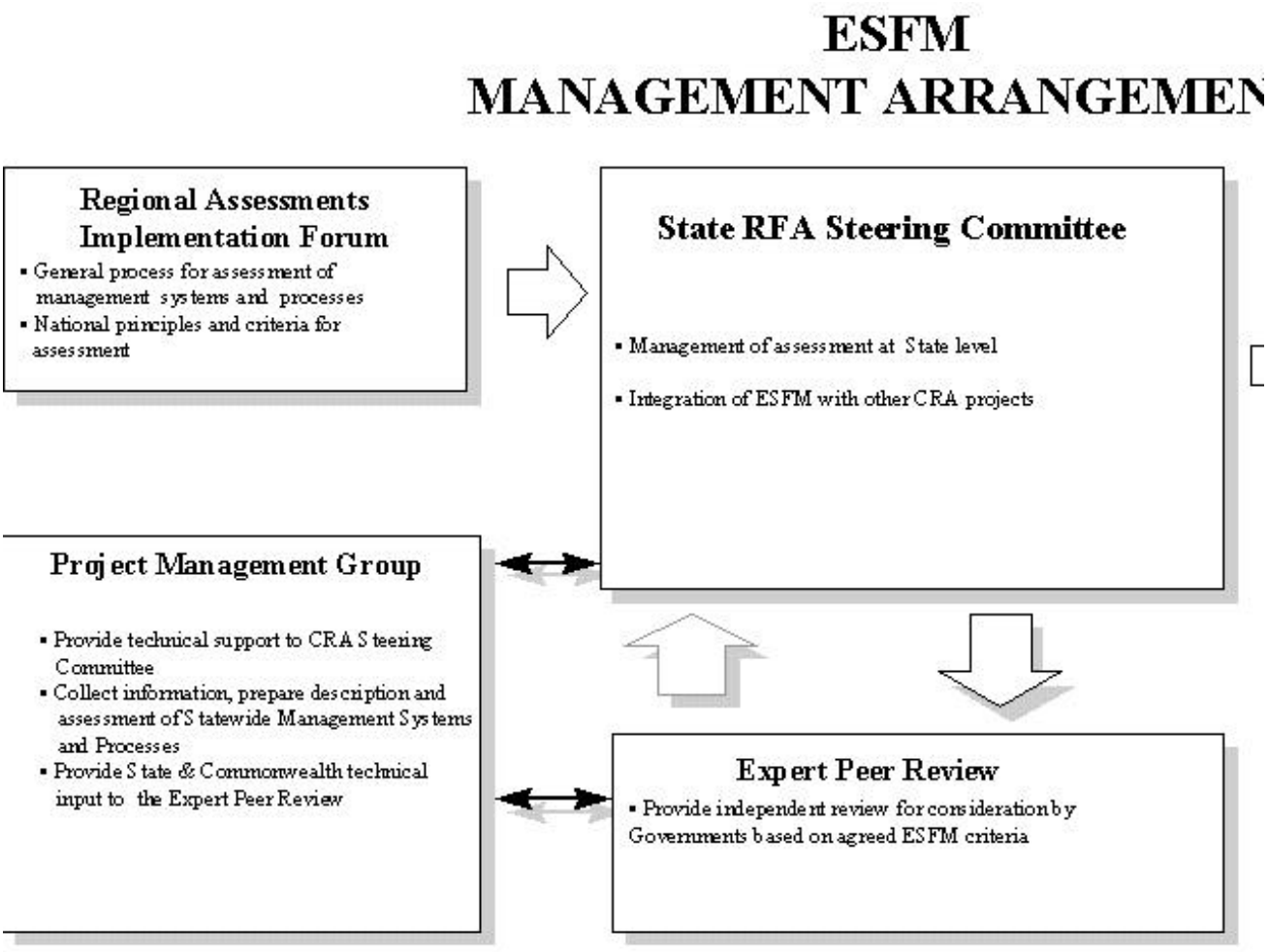


Figure 1.1 ESFM Management Arrangements

Table 1.2 Forest Management Systems and Processes in Victoria

1. LEGISLATION AND POLICIES	*2. PLANNING (continued)*
Commonwealth legislation and policies	*Cultural values*
Victorian Government legislation and policies	Aboriginal places
National Policies	Historic places
	Exploration and Mining
	Environmental Effects Statements
	Planning Permits
2. PLANNING	Work Plans
Strategic Planning	Environmental Review Committees
Regional Forest Agreements	*Other Plans*
Land Use Planning - Public land	
Forest management planning - public land	*3. IMPLEMENTATION*
Forest Management Plans (State forest)	*Programs and Budgets Operational Controls*
Victorian Code of Forest Practices	Timber harvesting in State forests
Regional prescriptions	Operations in National Parks
Sustainable Yield	Private land
Wood Utilisation plans	Control of fire management
Forest coupe plans	Documentation and records keeping
Log grading	Communication and Education
Park planning	Knowledge, skills and training
Park Plans	
Private land	
Land Use Plans	*4. INFORMATION MONITORING AND EVALUATION*
Education and cooperative programs	Forest information
Native Vegetation Retention Controls	Monitoring implementation of plans and progams
Code of Forest Practices for Private Land	Monitoring and evaluating condition of the forest environment
Waters of Victoria State Environment Protection Policy	Auditing of compliance with regulations and controls
Flora and Fauna Guarantee	Corrective action
Plantation Management	
Private forestry strategy	*5. REVIEW AND IMPROVEMENT*
Fire management planning	Review of the Environmental Management System
Code of Practice for Fire Management	Research and Development
Regional Fire Protection Plans	
Flora and Fauna planning	
Flora and Fauna Guarantee	
Recovery Plans	

Victoria's forest management systems and processes were classified into five components for the assessment of ecologically sustainable forest management.

Commitment and Policy Framework

The commitment of the Commonwealth and Victorian Governments, their Departments and relevant business units to ecologically sustainable forest management was assessed in terms of the development and application of appropriate legislation, policies, conventions and agreements which contribute to achieving ecologically sustainable forest management. The process for co-ordination of Commonwealth and State forest-related policies and legislative requirements was also treated under this heading.

Planning

Victoria's forest management planning process was described and assessed within a hierarchy of planning levels at different temporal and spatial scales. Strategic and operational planning processes apply across all land tenures, including codes and prescriptions, were assessed in relation to the nine ecologically sustainable forest management principles. A major focus of the assessment was whether management practices were supported by principles of environmental care, guidelines and minimum standards, the basis (quantitative, qualitative, expert opinion) for application of guidelines and minimum standards within codes for specific management practices, and transparency of the planning process. Focus was also given to legal requirements, environmental aspects of forest management practices, allocation of values to particular planning zones, planning processes for minimising environmental impacts of management practices, and appropriateness of plans and their scale and scope in relation to environmental objectives and targets.

Implementation

The capacity of the management system to use human and financial resources and be supported by administrative structures to ensure efficient and effective implementation of objectives is an essential component of ecologically sustainable forest management. The capacity and capabilities of governments and their agencies to deliver ecologically sustainable forest management through adequate accountability and responsibility, resourcing, operational controls, documentation, records keeping and reporting, communication, education and knowledge, skills and training was assessed.

Forest Information, Monitoring and Evaluation

Reliable information on natural, cultural and resource values at an appropriate level of detail and scale is required to plan and manage the forest estate on an ecologically sustainable basis. Measuring, monitoring and evaluating environmental performance are key activities for ensuring ecologically sustainable forest management and enable the identification of any corrective actions that may be required.

The assessment considered Victoria's systems for monitoring and evaluating environmental performance of the implementation of forest management plans and the condition of the forest in relation to requirements for ecologically sustainable forest management.

The process for auditing components of the management system and corrective actions to determine system performance was also assessed. Assessment of audit processes was based on their objectivity and impartiality, and whether they were conducted by properly trained personnel (Standards Australia, 1995).

Review and Improvement

Processes for review which lead to continuous improvement of the management system and environmental performance were assessed. For ESFM, review processes need to cover the capacity of the management system to accommodate issues such as changing legislation, changing expectations and requirements of interested parties, advances in science and technology, or lessons learned from environmental incidents (Standards Australia, 1995).

Regular evaluation of environmental performance of the system against environmental policies, objectives and targets can allow adjustments to the system to continually improve its performance and hence its delivery of ecologically sustainable forest management. Monitoring of the implementation of plans and of the condition of the forest, and research and development are key mechanisms for continual improvement. Feedback can occur at

two levels - in relation to short term planning and operations, and through long-term strategic planning, organisational commitment and an appropriate policy framework (Figure 1.2). Management system processes assessed in relation to the system's capacity for continual improvement in performance were:

- processes for improvement of the management system which can lead to improved performance;
- application of review findings and research and development at policy, management and planning levels; and
- effectiveness of research and development processes.

1.4 ESFM PRINCIPLES AND ASSESSMENT CRITERIA

Ecologically Sustainable Forest Management has been assessed against nine principles for ecologically sustainable forest management and five environmental management system criteria namely: public transparency; monitoring; compliance; scientific and technical basis; and review (Table 1.1).

The system criteria are defined and described in the table. The nine principles, described below, have been developed for national application from the Montreal Process, Forest Stewardship Council Principles and Australian Forestry Council Principles for Environmental Care in Native Hardwood Logging.

Principle 1 Maintain the full suite of forest values for present and future generations. This principle addresses the issue of intergenerational equity, that is, that forests be managed to meet present needs without compromising the ability of future generations to meet their own needs (Young, 1993). It provides the context in which principles 2-9 must be considered. Whilst there can be a range of interpretations of intergenerational equity, the Brundtland Report (World Commission on Environment and Development, 1987) expresses the relevance of this concept to sustainability and the long-term management of forests.

> 'Humanity has the ability to make developments sustainable - to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs' (Young, 1993).

Principle 2 Maintain and enhance long-term multiple socio-economic benefits to meet the needs of societies. The basis of this principle is the promotion of forest-related economic activity which is consistent with the maintenance of the environment and satisfaction of the socio-economic requirements for income, employment, goods and services. Implicit in this principle is the optimum use of the forest economy's capital stock (human, man-made and natural resource capital) through management so as to maximise the long-term welfare or benefit of society in terms of goods and services it requires. The forest economy covers timber and other forest products and uses, water supply, minerals, grazing, recreation and tourism.

Principle 3 Protect and maintain biodiversity. The maintenance of biodiversity is fundamental to achieving ecologically sustainable forest use (ESDWG, 1991; Commonwealth of Australia, 1992b). In the National Forest Policy Statement, biodiversity is defined as the variety of all life forms, the plants, animals and micro-organisms, the genes they constitute, and the ecosystems they inhabit. Incorporated into the concept of biodiversity is variation occurring at the ecosystem, species and genetic levels.

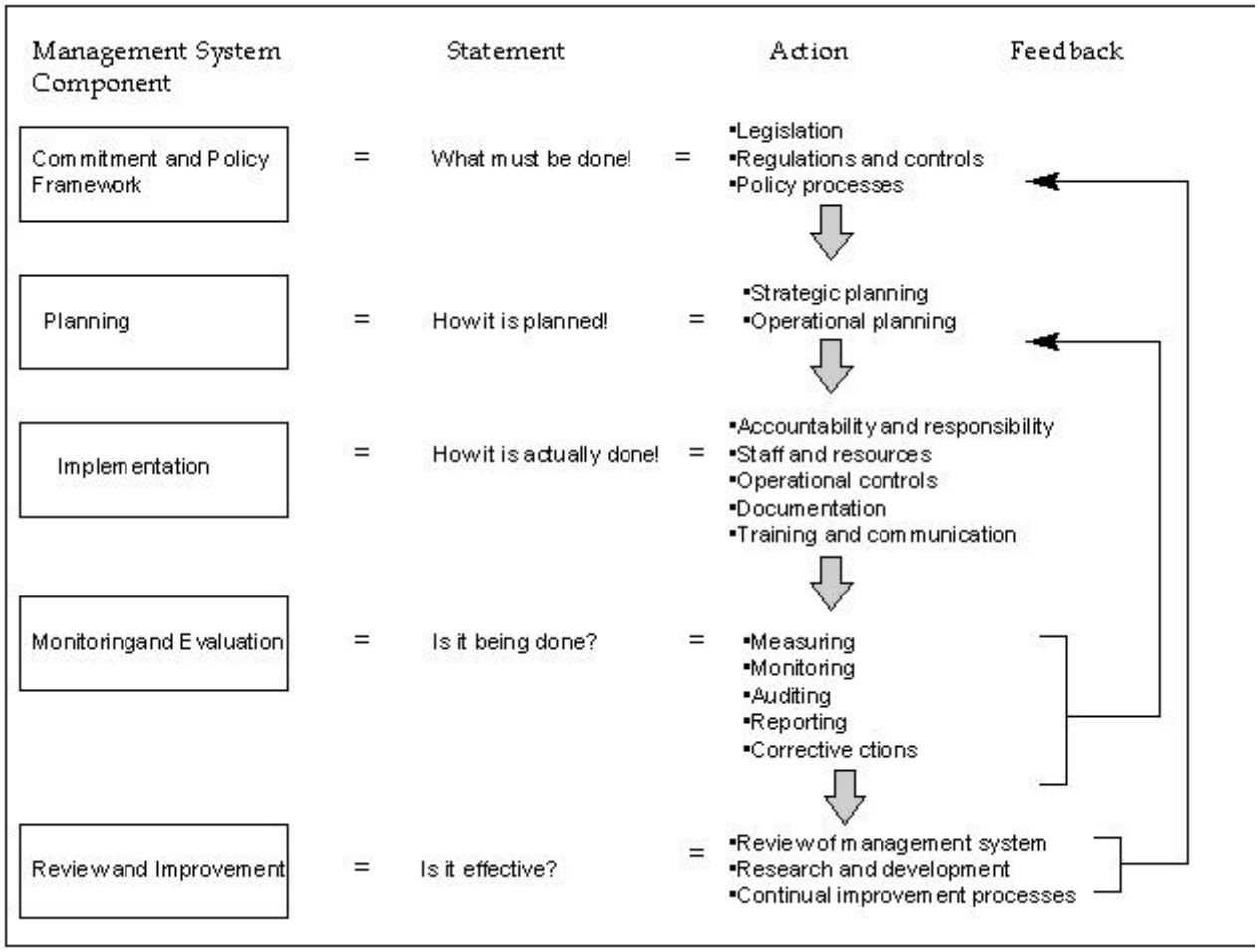


Figure 1.2 Operation of an Ecologically Sustainable Forest Management System

Principle 4 Maintain the productive capacity and sustainability of forest ecosystems. The concepts of productive capacity and sustainability of forests underpin this principle. Productive capacity covers the ability of a forest to produce biomass. Sustained production of biomass by forest ecosystems, whatever its fate (whether utilised by man or as part of nutrient and energy cycles), is essential to the well-being of all living things. The productive capacity of a forest can be influenced through the silvicultural regime and other management activities. Implicit in the term sustainability is the understanding that irreversible damage through resource use is not imposed on the capacity of the forest to supply goods or services to present and future generations (Ferguson *et al*. 1996).

Principle 5 Maintain forest ecosystem health and vitality. This principle reflects the concept of ecological integrity whereby the health and vitality of an ecosystem is maintained under changing environmental conditions. Structural and functional changes can occur in ecosystems as a result of threatening processes, such as land clearing, fire, pollution, pests and diseases. These can cause significant shifts in species composition, loss of key biological components such as decomposers, pollinators or food chain relationships, or the degradation of ecosystem processes (soil formation, energy flows and the carbon, nutrient and water cycles). Consideration of ecological integrity means determining thresholds of environmental change whereby each threshold results in a reorganisation of the ecosystem to a different but appropriate level. The properties and processes of forest ecosystems over management periods become important considerations for maintaining ecological integrity over time.

Principle 6 Protect soil and water resources. Forests contribute significantly to the maintenance and conservation of the soil resource; they afford water catchment protection, and maintain the quality and quantity of water.

Principle 7 Maintain forest contribution to global carbon cycles. Carbon is stored in Australian forests as living plant and animal biomass and dead organic matter in the form of forest debris. As a general rule, carbon is accumulated and stored in forests that are growing and which, as a consequence, contribute positively to carbon storage. Forests in which carbon is accumulated through photosynthesis but offset by the loss of carbon resulting from biomass, decomposition or death, are carbon neutral. Generally, forests that make a negative contribution to carbon storage are those that are regularly burnt, harvested on short rotations, or subject to heavy soil disturbance.

Principle 8 Maintain natural and cultural heritage values. Heritage encompasses archaeological sites, historic places and customs (cultural heritage), and natural values or objects (natural heritage) that are of aesthetic and social values and passed down to the present generation from past generations.

Principle 9 Utilise the precautionary principle for prevention of environmental degradation. The incorporation of the precautionary principle into decision making has been endorsed by State and Commonwealth Governments (Commonwealth of Australia, 1992b p.49; Commonwealth of Australia, 1992a) and is defined as ‘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.' In applying the precautionary principle, public and private decisions should be guided by:

- careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment; and
- an assessment of the risk-weighted consequences of various options’.

In interpreting this principle, particular attention was paid to processes based on ‘risk assessment’ and ‘risk management’ strategies. Such processes are important to minimise environmental impacts and avoid serious or irreversible damage to the environment.

1.5 PRESENTATION OF THE ESFM REPORT

The report has four parts:

1. an introduction and methodology;
2. a summary of the assessment of the Victoria's forest management systems and processes in relation to the ESFM principles and criteria;
3. a description and assessment of the management systems and processes based on the components of an environmental management system
4. an overall appraisal of Victoria's forest management systems and processes.

Statewide management systems and processes are described and assessed according to the five key management system components:

- commitment and policy framework
- planning
- implementation
- forest information, monitoring and evaluation
- review and improvement.

In each section, assessments are provided in relation to the ESFM principles where they are relevant, and/or according to the requirements of the ISO 14004 environmental management system.

2 SUMMARY OF ASSESSMENT

2.1 COMMITMENT AND POLICY FRAMEWORK

Legislation and National and State policies for the forests of Victoria provide a comprehensive framework for ensuring that all forest values are considered, assessed and afforded protection. In general, all the principles of ecologically sustainable forest management are met. On public land, legislation requires strategic land-use planning at the State/regional level through to legally enforceable Codes of Practice at the operational level (e.g. Code of Forest Practices for Timber Production). On private land, the legislation requires regional level planning, adherence to the Code of Practice for Timber Production and control of, for example, the clearance of native vegetation. In a number of instances, these arrangements are reinforced by legislation designed to safeguard particular values (e.g. Flora and Fauna Guarantee Act).

Revision of Commonwealth Acts such as the *Australian Heritage Commission Act 1975* and the *Environment Protection (Impact of Proposals) Act 1974* should be considered in the light of current RFA processes to improve coordination of forest management, and especially to develop a jointly agreed approach to identifying and assessing heritage values that minimises the overlap and differences between Commonwealth and Victorian legislation. Duplication in the application of Commonwealth and State Acts relating to the protection of endangered flora and fauna should be addressed.

Statutory land-use planning and management processes for public land in Victoria involve a precautionary approach in determining the need, level and mechanisms for protecting important environmental values. On private land, environmental protection, including requirements for retention of native vegetation, is achieved through planning scheme provisions under the Planning and Environment Act 1987 and is identified in Catchment Management Strategies under the *Catchment and Land Protection Act 1994*.

There is a legislative requirement to review sustainable sawlog yields every five years. The transparency of the review process could be improved. Yields are legislated and industry licence volumes are allocated on the basis of regional sustainable yield.

Potential socio-economic benefits are currently being foregone in Victoria by lack of utilisation of residual logs as a result of Commonwealth restrictions on export of woodchips. Harvest and export of pulpwood throughout Victoria would also have benefits for silviculture and fire management provided environmental values are protected.

Legislation has recently been passed by the Victorian Parliament to replace the Land Conservation Council with a new body called 'The Environment Conservation Council' whose task will be to conduct investigations into the balanced use or development of public land within the State.

2.2 PLANNING

Principle 1 Maintain the full suite of forest values for present and future generations

The planning processes in Victoria span all the levels required for achieving ecologically

sustainable forest management. Land Conservation Council studies have collected and assessed available information thoroughly, provided significant opportunities for public input, and ensured a balanced allocation of forested public land between resource use and conservation on a broad regional scale. The allocation of public land achieved through Land Conservation Council processes addresses all assessment criteria and provides a sound basis for ecologically sustainable forest management.

Preparing effective strategic plans for ecologically sustainable forest management requires methods for dealing with the often complex trade-offs necessary between competing ecological and socio-economic values. There is a strong need for sophisticated modelling approaches and data for dealing with these trade-offs, and this is being addressed.

Forest Management Plans, the Code and associated prescriptions applied within the land use framework established by the Land Conservation Council, provide a strong basis for achieving ecologically sustainable forest management. The plans specifically address parks and State forests but take account of all tenures in their attempt to balance resource use with other conservation and management requirements. Where forest management plans are not in place, the forest is managed according to approved LCC recommendations and NRE policy and guidelines. In such areas, the preparation of the Wood Utilisation Plan assumes a more important role. Wood Utilisation Plans are prepared by a multi-disciplinary team and must take account of all available information on timber, flora, fauna, catchment, land protection and cultural values. The monitoring of implementation of Wood Utilisation Plans occurs, however this is hampered by the lack of an adequate coupe recording and tracking system.

The Department of Natural Resources and Environment needs to develop a system for monitoring implementation of plans, commence reporting on plan implementation, and make the information publicly available, along with actions intended to address any identified deficiencies. For national parks, major issues include setting clear and strategic goals for the conservation of biodiversity (or other express purposes of reservation) that are realistic in relation to available resources and against which the success of management can be judged, and consideration of the collective contribution of individual parks to regional conservation (or other express purposes of reservation) in the planning processes.

The Native Vegetation Retention Controls, Flora and Fauna Guarantee and the Code provide mechanisms for protecting environmental and other values on private land. Strategic regional plans which address flora and fauna conservation issues are required to ensure their implementation is coordinated and directed towards clear conservation goals or other relevant goals. Catchment Management Strategies may fulfil this role but are not yet well-developed.

The environmental effects statements (EES) and planning processes for assessing exploration and mining applications provide opportunities for consideration of socio-economic, environmental and cultural values and for public participation. The incorporation of the former Department of Minerals and Energy into NRE should facilitate communication between formerly separate agencies and help produce more timely and balanced outcomes. NRE is however still refining its internal processes for assessment of exploration and mining applications. Work Plans provide mechanisms for the setting of suitable licence conditions. The local government planning process for assessment of mining applications is slow and often more adversarial than the EES process. The EES process is more objective and rigorous, providing better opportunities for consideration of scientific evidence and differing views on the relative merits of a proposal.

At the strategic planning level there are major opportunities for public input to forest management in Victoria. Public confidence in forest management planning could be increased by development of a more comprehensive set of performance indicators against which implementation of the plan can be assessed and setting of some more explicit targets against which the effectiveness of plans can be measured.

Principle 2 Maintain and enhance long-term multiple socio-economic benefits to meet the needs of societies

The Flora and Fauna Guarantee Act and the Land Conservation Act have clear requirements for involvement of scientific experts, community consultation and consideration of socio-economic issues. These issues could be considered more thoroughly in preparing forest management plans where necessary. Current policy and programs are principally directed at improving and extending the plantation estate on private land and the economic returns and environmental and social benefits provided by plantations and trees on farms.

There is a need for better links between forest management plans, local government planning and cross border regional planning for industry, tourism, recreation and catchment management. Significant changes in industry opportunity (e.g. value-adding, pulpwood utilisation, tourism) should trigger re-examination of forest management plans.

Principle 3 Protect and maintain biodiversity

Planning for protection of biodiversity in Victoria involves a hierarchy of strategic and operational plans which assess the need for reservation or special management at all scales from region to coupe, and puts in place regional and local prescriptions designed to limit the impacts of timber harvesting and other activities on flora and fauna and other values. The reserve system established by the Land Conservation Council land use planning process is supplemented by a complementary zoning scheme in State forests which provides special prescriptions for conservation of Ecological Vegetation Classes, old-growth forests, and threatened flora and fauna. Overall, these planning processes make a major contribution to meeting the requirements for protecting and maintaining biodiversity and complementary management of "off-reserve" areas. Once the boundaries of the National Reserve System are determined, mechanisms need to be developed to accommodate long-term changes in landscape dynamics through removal, exchange, or addition of areas on or near the boundaries. These mechanisms for periodic changes should seek to maintain adherence to the reserve criteria and the level of the sustainable yield but provide sufficient flexibility to accommodate new information.

The effectiveness of Action Statements and Recovery Plans for flora and fauna need to be better assessed, based on monitoring and research. While Action Statements and Recovery Plans have been completed for numerous species, they have not been completed for communities and threatening processes. Additionally the overarching Flora and Fauna Guarantee Strategy has yet to be completed. These elements of the Flora and Fauna Guarantee should be implemented to ensure a coordinated approach to flora and fauna conservation.

Strategic regional plans are required to ensure that mechanisms for protecting biodiversity on private land are coordinated and directed towards clear flora and fauna conservation goals.

Principle 4 Maintain the productive capacity and sustainability of forest ecosystems

The adequacy of the existing Statewide process for estimating sustainable yield in those areas with a forest management plan has been reviewed as part of the East Gippsland RFA

process (VicRFASC 1996a). Procedures and data for achieving these estimates are coarse at present but uncertainties are accounted for by making conservative estimates of sustainable yield.

The process should continue to be as transparent as possible within restrictions relating to commercial confidentiality. It should continue to seek input of the best available specialist expertise from within and outside the Department of Natural Resources and Environment, and include regular reviews as legislated in relation to monitoring indicators of ecological sustainability.

The fact that formal review of sustainable yield is a separate process to preparation of Forest Management Plans is seen by some community groups as a potential impediment to achieving ecologically sustainable forest management. It should be recognised, however, that the five-yearly review of sustainable yield takes account of changes in the land base for timber production to meet conservation needs. Greater explanation of the procedure for estimating sustainable yield and making the methodology and data used publicly available at an earlier stage than has occurred previously would raise public confidence in this process. Sustainable yield and actual hardwood sawlog supply levels should be routinely reported and be publicly available.

Principle 5 Maintain forest ecosystem health and vitality

Wildfires pose a significant threat to resources, property and forest values on both public and private lands. Potential losses are considered in planning. Clearly established planning guidelines under the Code of Practice for Management of Fire on Public Land and strategic and operational plans provide a sound basis for integrated and effective management and control of fire in Victoria. The current practice of ensuring that fauna and flora officers have input to fire management plans is an important part of minimising risks to biodiversity. On private lands, the processes and planning mechanisms adopted by the Country Fire Authority provide a logical and accountable basis for strategic and operational planning for prevention and control of wildfires. While most issues are appropriately dealt with through strategic and additional plans, the overall effectiveness of pest management is limited by the lack of strategic plans for pest plant and animal control that cover all tenures. Operational planning processes should provide continuing programs for training and updating field staff and access to support materials.

Principle 6 Protect soil and water resources

For State forests, the Code of Forest Practices and supporting local management prescriptions provide guidelines for protection of soil and water values. The guidelines given in the Code are designed as State-wide minimum standards and therefore cannot address regional variation. The development of regional prescriptions that build on Code standards to take account of local factors such as soil types and climatic conditions is required and should continue, as should research into the development of indicators of soil damage caused by harvesting machinery.

Areas of high soil erosion risk are often excluded from harvesting and may be placed in the Special Protection Zone as part of a Forest Management Area plan. The management of these and other erosion-prone areas in reserves is based on exclusion or careful management of fire and other activities to maintain vegetation and litter cover. Inclusion of targets in forest management plans for soil and water quality should be considered.

Catchment Management Authorities have played an important role in analysing threats and beneficial uses and must continue to do so to provide appropriate strategies to protect soil and water at the sub-catchment level.

Principle 7 Maintain forest contribution to global carbon cycles

Victoria aims to progressively increase its total forest cover through programs such as Landcare and the Tree Victoria Action Plan. There is a judgement by forest managers that conversion of mature forest to regrowth will maintain carbon storage, and that management burning will have a neutral long-term effect on forest carbon budgets. Little information is available to test these judgements at a regional scale. The areas of greatest uncertainty are the pattern of carbon re-accumulation in forest biomass after harvesting, the effects of harvesting and fire regimes on changes in the soil carbon store, and the residence time of carbon in harvested forest products.

Principle 8 Maintain natural and cultural heritage values

A suite of legislation protects all archaeological sites (Aboriginal and historic), significant historic sites, and aesthetic values. They are recognised at the strategic forest management level and in a range of management plans. More detailed strategies for the identification and protection of cultural heritage values, including Aboriginal sites, are required.

Deficiencies at the operational planning level need to be addressed through improved liaison with Aboriginal Affairs Victoria to implement the Aboriginal and Archaeological Relics Act, and increased participation of Aboriginal communities in Aboriginal site identification and management. A systematic approach to Aboriginal site impact assessment through appropriate ongoing identification of values (through consultation with communities and field survey) is required.

Principle 9 Use the precautionary principle for prevention of environmental degradation

A precautionary approach to forest management is adopted through a range of planning processes including a conservation reserve and zoning system, reservation of Ecological Vegetation Classes based on rarity and other indicators of risk, application of management prescriptions to ameliorate threatening processes in forests managed for timber harvesting and in sustainable yield.

Areas for improvement include:

- recognition in Forest Management Plans of the contribution of all forest areas to regional conservation goals e.g. General Management Zone;
- development of a formal approach to risk assessment at the commencement of the planning process and at periodic reviews to give greater confidence in the measures taken to ameliorate risk and to better identify the need for research into new types of information;
- development of flexible corridor networks to accommodate changes in habitat where necessary.

2.3 IMPLEMENTATION

The accountabilities and responsibilities for delivery of each element of ecologically sustainable forest management are clearly established. The high level of public ownership and land management by one Department provides a good basis for a coordinated approach to ecologically sustainable forest management and minimises overlap and duplication between government agencies. Service delivery is facilitated by a departmental structure with both centralised control and strong decentralised components. The creation of Parks Victoria as a provider of park management services to NRE is new. It is unclear whether policy and regulatory functions can be clearly and effectively separated and maintained by the Parks Program within NRE, and whether the protocols and other planning measures

concerning coordination across these and other bodies within NRE and Parks Victoria will be effective in fire and other management activities. These aspects merit review and continued improvement.

The program and budgeting process of NRE generally reflects National Forest Policy Statement initiatives to improve public forestry accounting systems. In this way, the performance of both commercial activities and community service obligations can be clearly evaluated. A strength of the business unit structure is that it should allow all costs and benefits relating to ecologically sustainable forest management to be fully identified. Uniform treatment of all business units and activities is acknowledged to be difficult and ongoing refinements are needed. Particular attention is needed to identify costs on a regional basis and to separate costs of commercial and non-commercial activities. The level of funding to an individual region should be linked to the requirements for effectively implementing the strategic and annual plans for ecologically sustainable forest management in that region. Maintenance of a strategic focus for research into ecologically sustainable forest management also needs a continuing commitment to funding. For sustainable fire management, it is important to ensure that levels of skilled staff for fire-planning and suppression activities are maintained at least at current levels.

The process for control of forest operations to achieve compliance with the Code of Forest Practices and Coupe Plans is transparent and accountable. There is clear responsibility for control for each stage of timber harvesting from supervision of the implementation of the Coupe Plan to the signing of a Coupe Completion certificate following satisfactory compliance with the plan, including draining of major snig tracks and rehabilitation of landings. A major strength in managing timber harvesting operations is the Forest Operator Licensing System The indicator point system provides a strong basis for the regulation of harvesting activities conducted by independent contractors to ensure they conform with the Code of Forest Practices. The process of control to achieve compliance with the Code of Fire Management on Public Lands is transparent and accountable. Country Fire Authority requirements for supervision by trained staff of all fire prevention and control operations, and a permit system for prescribed buring by private landholders provides an accountable basis for control of fire operations on private land. Improvement is needed in the forthcoming reviews of Fire Protection Plans to ensure that specialist peer review is generally undertaken. The lack of auditing processes for other Departmental operations is a weakness which should be addressed. In particular, there is a need to audit the extent of compliance of strategic and operational plans. An area for improvement is the supervision of forest operations where protection of archaeological or heritage values is important.

Statewide guidelines and procedures for parks and reserves provide guidance and a consistent approach across the State for a variety of field operations and park management issues. Supervision of contractors by field staff, ranger patrols to ensure visitor compliance with regulations, and leases and licences provide further operational control.

Private landholders are responsible for controlling activities on their land. Native Vegetation Retention Controls, Flora and Fauna Guarantee and the Code provide mechanisms for protecting environmental values on private land, however, their implementation lacks coordination. It is important to ensure this is coordinated and directed towards clear flora and fauna conservation goals. Development of further practical guides, and other information material describing good forest practice, especially to assist small plantation owners, would be helpful. Greater consistency in the interpretation of the Native Vegetation Retention Controls for plantation development is required.

Timber Harvesting Plans which conform to the Code and the S13 amendment to the

planning scheme must be lodged for timber harvesting operations on private land with the responsible authority. This is usually local government which is then responsible for ensuring compliance with the provisions of the plan. These can be enforced through formal enforcement orders and subsequent recourse to the Administrative Appeals Tribunal. Local government often does not have the expertise to implement Native Vegetation Retention Controls, to assess cultural and heritage values, or to monitor compliance with permit conditions. Continued improvement in this area is necessary. Expansion of the trial in Gippsland using accredited forestry personnel to ensure harvesting plans comply with the Code, if successful, should be encouraged.

For exploration and mining, the on-ground presence of NRE staff is designed to ensure that monitoring of compliance with licence conditions occurs and that progressive rehabilitation of mine sites is satisfactory. Rehabilitation bonds provide a further incentive for compliance.

Most documents comprising the environmental management system are published or are made publicly available. Greater attention should be paid to ensuring that up-to-date copies of key documents, for example, management prescriptions, are readily available to staff and other relevant parties. There is a need for a computerised database system to record forest operations, in particular, timber harvesting. This is important to ensure that old-growth forest and forest resource inventory information is regularly updated. Archival material of particular interest to ecologically sustainable forest management including historical records of fire, storm, settlement, timber harvesting, is not properly catalogued and stored. There is a need for retaining and transmitting the corporate knowledge base. This requires documentation of procedures, regular training and effective induction.

While NRE and Parks Victoria have training programs in place, there is room for improvement in a number of areas. Effective operational planning depends on, for example, identification of critical values at the local (coupe) scale (e.g. habitat requirements in Special Management Zones, soil erodibility). On-ground assessments are made by Forest Officers and Park Rangers and a wide range of skills are required to make competent professional judgements. Current planning processes need to better emphasise the importance of adequate technical training of field staff and access to support materials.

2.4 FOREST INFORMATION, MONITORING AND EVALUATION

The development of flora and fauna databases covering all land tenures and the development of data gathering programs directly linked to strategic planning requirements is a strength of NRE's planning process and also provides a basis for strategic long term monitoring of forest change. There are parallel databases for natural and cultural heritage places in forests. The joint Australian Heritage Commission/Department of Natural Resources and Environment studies have utilised existing databases and established new databases for many layers of site-based values. The Department’s operational planning systems could be improved significantly through access to and regular updating of data concerned with Aboriginal sites.

Areas for improvement in forest information include:

- gathering and storage of socio-economic data for consideration in strategic plans;
- development of a State-wide computerised site, site management and visitor statistics database in national parks to improve the management process;
- systematic surveys of plant pest location and density and the development of a specific strategic plant and animal pest protection plan (similar to the fire protection plan)

identifying priority control zones;

- making the GIS available to staff in the more remote areas of the State as well as Melbourne and major regional centres;
- implementation of the Integrated Forest Planning System as new data from SFRI becomes available electronically.

While recent strategic plans include mechanisms to monitor their implementation, this is a relatively new process and implementation reports are yet to become available. It is essential that NRE complete the system for monitoring implementation of park plans, commence reporting on plan implementation on all land tenures, and make the information publicly available, along with actions intended to address any identified deficiencies. Monitoring of implementation of Wood Utilisation Plans is hampered by the lack of an adequate coupe recording and tracking system. The Department's monitoring process provide a sound basis for ensuring forest regeneration, however, assessment of other sustainability indicators could be undertaken during regeneration assessments to monitor the effects of forest operations

NRE has a large body of information on the forest environment and a number of specific monitoring programs, however, the development of sustainability indicators is essential to assess whether stated forest management objectives are being met. While many indicators are implicit in current management plans, specific indicators and programs are required for monitoring biodiversity, health and vitality of forest ecosystems, soil and water resources, and social and cultural heritage values. Monitoring is required to assess whether prescriptions, such as habitat tree retention, linear reserves and streamside buffers achieve their desired objectives in the longer term. The monitoring of road and track condition on public land is inadequate, leading to risks to soil and water quality. This is especially the case for those pre-dating the Code of Forest Practices. Indicators need to be sensitive to, and representative of ecological change at strategic and operational scales. The applicability of presently held data for this purpose will need to be assessed.

Reference Areas have the potential to be valuable for monitoring long-term changes in forest ecosystems. A detailed inventory of the Reference Area system is required including an assessment of its representativeness, extent of replication, and the degree to which it provides reliable examples of forests unaffected by humans.

There are no formal processes for routine and regular audit of compliance with some Departmental policies and plans. Periodic audits are recommended. Auditing for compliance of components of Victoria's management system with the Code and exploration and mining licences is internally based and appropriate. Auditing applies to coupe planning, timber harvesting operations, log grading, fire operations, exploration and mining, and record-keeping. A strength of the auditing system in State forests is that a summary of results is made public and that substantial penalties are possible for breaches. NRE's internal audit of timber harvesting and log grading operations is an appropriate and effective means for assessing compliance with the Code and prescriptions. The use of staff from outside the region subject to audit is a strength of the process. Consideration should be given to increasing the transparency of audits by making the results of audit processes publicly available along with measures taken to address deficiencies and by increasing the independence of the audit teams. Log grade audit results should be published. Consideration should be given to independent log grading procedures, perhaps related to the audit of the Code outlined above. The number of coupes audited may be too small to adequately sample the full range of environmental conditions under which problems may occur. Code audits should cover both public and private land, including plantations.

Corrective actions result from reviews of operational prescriptions and procedures, audit findings and results of regeneration performance, reports on Annual Service Agreements, supervision of field operations, and enforcement patrols to detect unauthorised activities in Parks or State forest. To improve transparency, NRE should better document corrective actions taken.

2.5 REVIEW AND IMPROVEMENT

A process for reviewing the forest management system components has not been formally developed by NRE. A process with appropriate reporting mechanisms, such as a 'state of the forests report' is required to ensure continuous review and improvement of the management system. This would be in keeping with developments in forestry organisations throughout the world. The scientific basis of those parts of forest management which generate greatest environmental risk or are subject to contrary scientific interpretations, together with those where scientific knowledge is advancing rapidly should be subject to more frequent peer review.

NRE's research program clearly links to providing information for improving strategic planning and reducing environmental risks in forest management. A stronger commitment to the timely completion, appropriate peer review and publication of scientific research would improve public confidence and the scientific basis of forest management. A well defined long-term research and development program in which critical areas for research and development are identified is needed.

3 STATEWIDE ASSESSMENT OF VICTORIAN FOREST MANAGEMENT SYSTEMS AND PROCESSES

3.1 COMMITMENT AND POLICY FRAMEWORK

3.1.1 International Treaties, Conventions and Initiatives

International treaties, organisations, conventions and initiatives applicable to the management of Victorian forests include:

- The Rio Declaration and Agenda 21 including The Statement of Forest Principles
- The United Nations Framework Convention on Climate Change
- The United Nations Framework Convention on Biological Diversity
- The United Nations Commission for Sustainable Development
- The 'Montreal Process' and the 'Santiago Declaration'
- Intergovernmental Panel on Forests
- General Agreement on Tariffs and Trade Convention (1994)
- Food and Agriculture Organisation (FAO)
- Convention Concerning the Protection of the Natural Resources and the Environment of the South Pacific Region (SPREP Convention) 1986
- Convention for the Protection of the World Cultural and Natural Heritage (World Heritage Convention) 1972
- Convention on Wetlands of International Importance Especially as Waterfowl Habitat 1971 (Ramsar Convention)
- China-Australia Migratory Bird and Japan-Australia Migratory Bird Agreements (CAMBA and JAMBA).
- Man and the Biosphere Programme
- Convention on the Conservation of Migratory Species of Wild Animals 1979 (Bonn Convention)
- Convention on International Trade in Endangered Species of Wild Fauna and Flora 1973
- Convention on Conservation of Nature in the South Pacific 1976 (Apia Convention)

3.1.2 Commonwealth Government Legislation

Under the Australian Constitution, primary responsibility for land management is retained by the States. Commonwealth legislation applicable to the management of Victorian forests is listed below. Legislation having direct implications for forest management is briefly described.

- Environment Protection (Impact of Proposals) Act 1974
- Australian Heritage Commission Act 1975
- Endangered Species Protection Act 1992
- Export Control Act 1982

- Wildlife Protection (Regulation of Exports and Imports) Act 1982
- Quarantine Act 1908
- Forestry and Timber Bureau Act 1930
- World Heritage Properties Conservation Act 1983
- Aboriginal and Torres Strait Islander Heritage Protection Act 1984
- Native Title Act 1993
- National *Parks and Wildlife Conservation Act (1975)*

The ***Environment Protection (Impact of Proposals) Act 1974*** requires that environmental impacts are considered when Commonwealth actions are undertaken and decisions made. The Act is administered the Environment Protection Group, Environment Australia, an agency of the Department of the Environment, Sport and Territories, and is triggered when a Commonwealth action will, or is likely to, affect the environment to a significant extent. The Environmental Protection Group makes a recommendation to the Minister for the Environment on the need for a public assessment in the form of an Environmental Impact Statement or a Public Environment Report. The Environment Protection Group considers whether there will be a substantial impact on the environment, whether a Statement or Report would be against the public interest, and whether potential impacts have already been adequately considered through another process such as a State Environmental Impact Statement or a Comprehensive Regional Assessment/Regional Forest Agreement.

Australian Heritage Commission Act 1975. The Australian Heritage Commission identifies and maintains a Register of the National Estate and is the Commonwealth Government's adviser on its protection. Sections 9 and 30 of the Act impose obligations on Commonwealth Ministers, Departments and Authorities. The Commission prepares a Statement of Significance for every place on the Register.

The Endangered Species Protection Act 1992 and the Endangered Species Program are administered by the Commonwealth Government. The Act has a schedule of nationally vulnerable and endangered species and endangered ecological communities and requires that these are taken into account in all Commonwealth actions and decisions. The Act is linked to the Commonwealth's Environment Protection (Impact of Proposals) Act 1974 whereby any action which could threaten with extinction or significantly impede the recovery of a listed species or community is considered to be environmentally significant and therefore requiring an environmental impact assessment. The Endangered Species Program comprises strategic planning, public education and project funding to bring about the recovery of threatened species and ecological communities in all Australian habitats, including forests.

The Export Control Act 1982. A Commonwealth licence is required for the export of unprocessed wood (including woodchips) sourced from native forests in Victoria. The Commonwealth is required to consider listed species and communities in issuing licences which include appropriate broad licence conditions providing for the protection of listed threatened species.

In considering applications for licences to export unprocessed wood under the Export Control Act 1982, the Minister for Primary Industries and Energy takes into account export prices, opportunities for domestic processing, possible effects on the environment, and the applicant's ability to export material. If the Minister considers that an export licence may have a significant impact on the environment, he/she may designate a proponent to the Minister for the Environment under the Environment Protection (Impact of Proposals) Act

1974. Where a proponent is designated, the Minister for Primary Industries and Energy must consider the advice of the Minister for the Environment in deciding to grant or to refuse an export licence application.

Under the Australian Heritage Commission Act 1975, the Minister for Primary Industries and Energy is required to seek the comments of the Australian Heritage Commission where a decision to grant an export licence may have a significant effect on a place on the Register (or Interim List) of the National Estate. If the Minister considers that the granting of an export licence might affect such a place, the Minister is required to seek the comments of the Commission.

Woodchip export licences prohibit export of woodchips from wood harvested from a native forest in an Interim Forest Area. Woodchips may only be exported where produced from wood harvested in the Interim Resource Areas, which are based upon harvesting schedules under States' wood utilisation plans. These are designed to meet sawlog demand until Regional Forest Agreements are achieved.

The ***Wildlife Protection (Regulation Import and Exports) Act 1982*** regulates the export of a wide range of native animals and plants (excluding wood products) and requires wildlife harvesting activities to be subject to an approved management regime before the export of products can be authorised.

The ***Quarantine Act 1908*** is designed to prevent the introduction or spread of diseases or pests affecting human beings, animals or plants by measures including inspection, treatment, sanitary regulation, and disinfection of persons, goods animals or plants. The *Export Control Act 1982* imposes a level of inspection on export products related to the specific requirements of importing countries. Export of native plant or animal products is subject to inspection by the Australian Quarantine and Inspection Service**.**

3.1.3 NATIONAL POLICIES

The National Forest Policy Statement 1992. This Statement, endorsed by Commonwealth, State and Territory Governments, attaches the utmost importance to sustainable management of Australia's forests (Commonwealth of Australia, 1992b). It lays the foundation for future forest management in Australia. Under the ecologically sustainable development approach accepted by Governments, the public and private native forest estate will be managed for the broad range of commercial and non-commercial benefits and values it can provide for present and future generations. Efficiently and sustainably managed public and private forests will provide the basis for nature conservation and maintaining forest biological diversity, and for regional economic development and employment opportunities in a wide range of sectors, including wood production from native and plantation forests, tourism and recreation, water supply, grazing and the pharmaceutical industry.

The Governments share a vision of ecologically sustainable management of Australia's forests. This vision has a number of important characteristics:

- The unique character of the Australian forested landscape and the integrity and biological diversity of its associated environment is retained;
- The total area of forest is increased;
- There is a holistic approach to managing forests for all their values and uses so as to optimise benefits to the community;
- Private forests are managed in an ecologically sustainable manner and in close

cooperation with public forest management, so as to complement the conservation and commercial objectives of public forests;

- A range of sustainable forest-based industries, founded on excellence and innovation, will be expanded to contribute further to regional and national economic and employment growth;
- Forests and their resources are used in an efficient, environmentally sensitive and sustainable manner;
- Forest management is effective and responsive to the community; and
- The Australian community will have a sound understanding of the values of forests and sustainable forest management, and will participate in decision-making processes relating to forest use and management.

The Governments agree that, to achieve their vision, eleven broad national goals must be pursued. These goals should be pursued within a regionally-based planning framework which integrates environmental and commercial objectives so that, as far as possible, all forest values are maintained.

The eleven broad national goals are as follows:

1. ***Conservation***. The goals are to maintain an extensive and permanent native forest estate in Australia and to manage that estate in an ecologically sustainable manner so as to conserve the full suite of values that forests can provide for current and future generations. These values include biological diversity, and heritage, Aboriginal and other cultural values.
2. ***Wood production and industry development***. The goal is for Australia to develop internationally competitive and ecologically sustainable wood production and wood products industries.
3. ***Integrated and coordinated decision-making and management***. The goals are to reduce fragmentation and duplication in the land use decision-making process between the States and the Commonwealth and to improve interaction between forest management agencies in order to achieve agreed and durable land use decisions.
4. ***Private native forests***. The goal is to ensure that private native forests are maintained and managed in an ecologically sustainable manner, as part of the permanent native forest estate, as a resource in their own right, and to complement the commercial and nature conservation values of public native forests.
5. ***Plantations***. One goal is to expand Australia's commercial plantations of softwoods and hardwoods so as to provide an additional, economically viable, reliable and high-quality wood resource for industry. Other goals are to increase plantings to rehabilitate cleared agricultural land, to improve water quality, and to meet other environmental, economic or aesthetic objectives.
6. ***Water supply and catchment management***. The goals are to ensure the availability of reliable, high-quality water supplies from forested land and to protect catchment values.
7. ***Tourism and other economic and social opportunities***. The goal is to manage Australia's forests in an ecologically sustainable manner for a range of uses, including tourism, recreation and production of non-wood products.
8. ***Employment, workforce education and training***. The goal is to expand employment opportunities and the skills base of people working in forest management and forest-based industries.

9. ***Public awareness, education and involvement***. The goals are to foster community understanding of, and support for, ecologically sustainable forest management in Australia and to provide opportunities for effective public participation in decision-making.
10. ***Research and development***. The goals are to increase Australia's national forest research and development effort and to ensure that it is well coordinated, efficiently undertaken and effectively applied. This research will expand and integrate knowledge about the many aspects of native forests, plantations, forest management, conservation, and forest product development.
11. ***International responsibilities***. The goals are to promote nature conservation and sustainable use of forests outside Australia and to ensure that Australia fulfils its obligations under relevant international agreements.

The objectives and policy initiatives are underpinned by the following agreed approaches to forest management:

- The Governments will set the regulatory framework for the use of native forests in order to achieve social and environmental objectives.
- Market forces should determine the extent of resource use and the nature of industry operations, within the parameters of Government industry policy.
- Commercial uses of forests (including wood production) that are based on ecologically sustainable practices are appropriate and desirable activities.
- The Governments will seek complementary management of forests for all uses through integrated strategic planning and operational management by agencies with responsibility for forests in Australia.
- There should be a sound scientific basis for sustainable forest management and efficient resource use.

Ecologically sustainable forest management is to be given effect through the continued development of integrated planning processes, through Codes of Practice and environmental prescriptions, and through management plans which, among other things, incorporate sustainable yield harvesting practices. Such mechanisms will cover private forests where appropriate.

Nationally Agreed Criteria for the establishment of a Comprehensive Adequate and Representative Reserve System for Forests in Australia 1997 (also known as JANIS criteria). A major element of the NFPS includes a commitment to develop a comprehensive, adequate and representative (CAR) reserve system and implement strategies to protect old growth forests and wilderness. The Criteria provide an objective basis for ensuring conservation of biological diversity and other values within a national reserve system.

The **National Strategy for Ecologically Sustainable Development**, released and endorsed by the Council of Australian Governments in 1992, outlines key objectives for the management and use of Australia’s native forests. The Council agreed that the future development of all relevant policies and programs, particularly those which are national in character, should take place within the framework of the Strategy and the Intergovernmental Agreement on the Environment.

The **Intergovernmental Agreement on the Environment 1992** provides a framework for cooperation between the Commonwealth and States on environment, resource and conservation management. It facilitates a cooperative national approach to the environment,

defines the roles of the respective Governments and provides for greater certainty of Government and business decision-making. It encourages better environmental protection, and reduces duplication of functions between different levels of Governments. Governments are committed to ensuring that matters of national interest are properly taken into account. The following principles apply to the Agreement.

- Adoption of sound environmental practices and procedures, as a basis for ecologically sustainable development, will benefit both the Australian people and their environment, and the international community and its environment;
- Effective integration of economic and environmental considerations in decision-making processes is required in order to improve community well-being and benefit future generations;
- Strong, growing and diversified economies based on ecologically sustainable development principles can enhance the capacity for environmental protection;
- To achieve sustainable economic development, a country's international competitiveness needs to be maintained and enhanced in an environmentally sound manner;
- Environmental issues associated with proposed projects, programs or policies should be considered and there should be proper examination of matters significantly affecting the environment;
- The precautionary principle should apply: where there are threats of serious or irreversible environmental damage, lack of full scientific certainty is not to be used as a reason for postponing measures to prevent environmental degradation;
- Intergenerational equity should apply: the present generation should ensure that the health, diversity and productivity of the environment (including renewable resources) is maintained or enhanced for the benefit of future generations;
- Conservation of biological diversity and ecological integrity should be a fundamental consideration;
- Environmental factors should be included in the evaluation of assets and services;
- Those who generate pollution and waste should bear the cost of containment, avoidance or abatement;
- Users of goods and services should pay prices based on the full life-cycle costs of providing those goods and services, including the use of natural resources and ultimate disposal of wastes; and
- Environmental goals, should be pursued in the most cost-effective way.

Schedules covering data collection and handling, resource assessment, land use decisions and approval processes have been developed.

The **Wood and Paper Industry Strategy 1995** is a Commonwealth Government initiative to encourage investment, value-adding and jobs growth in forest-related industries. It analyses the current state of the forest and forest products industry, discusses potential opportunities and proposes a strategy for industry development. The Strategy is a mechanism for implementing the goals of the National Forest Policy Statement relating to industry development.

The **National Greenhouse Response Strategy 1992** aims to: limit greenhouse gas emissions and enhance greenhouse gas sinks; improve knowledge and understanding of the

enhanced greenhouse effect; and, prepare for potential impacts of climate change in Australia. Response initiatives under this strategy include: conserving and enhancing the sink capacity of Australia's forests, minimising greenhouse emissions from the natural environment caused by human activities (eg fire), adopting vegetation retention controls, forestry management measures and land use practices to conserve sinks, creating conservation reserves, increasing forest estate through reafforestation and rehabilitation, maintaining soil quality, promoting recycling and higher efficiency in conversion of harvested timber, and giving effect to ecologically sustainable management of native forest and plantations on public and private lands.

The **National Reserve System Initiative** aims to assist in establishing and maintaining a comprehensive, adequate and representative system of protected areas. The National Reserve System will contain all major ecosystems and include significant environmental values, threatened species and ecological communities. National reserve criteria have been agreed in conjunction with regional forest assessment processes (JANIS, 1996).

The purpose of the **National Strategy for the Conservation of Australia's Biological Diversity 1992** is to implement Australia's obligations under the Convention on Biological Diversity. The fundamental basis of the strategy is the incorporation of biodiversity conservation in all relevant decision-making and management processes. Victoria, through the Department of Natural Resources and Environment, continues to actively participate in implementation of the strategy, including the development of an interim bio-regionalisation of Australia, rapid biodiversity assessment techniques and a State biodiversity strategy.

Australian National Strategy for the Conservation of Australian Species and Communities Threatened with Extinction. The Intergovernmental Agreement on the Environment commits governments to ensure the survival of species and ecological communities. A national approach to the protection of rare, vulnerable and endangered species (threatened species) was developed in the draft Strategy.

The **Australia ICOMOS Charter for the Conservation of Places of Cultural Significance 1979 (The Burra Charter)** deals with the preservation and restoration of historic monuments. Based on the *Venice Charter*, it has been widely accepted and adopted as the standard for heritage conservation practice in Australia**.**

The **National Weeds Strategy** is expected to be released in mid-1997. It addresses weed problems of national significance, in particular those which threaten the profitablility of Australia's principal primary industries, conservation areas, environmental resources, or biodiversity, and where remedial action across several states and Territories is required. Specific action programs to be implemented under the Strategy will be detailed in triennial action plans.

The **National Feral Animal Control Strategy** is under development. Under the *Endangered Species Protection Act 1992*, the Commonwealth is required to prepare and implement, in cooperation with States and Territories through the Feral Pests Program (FPP), a joint threat abatement plan for each listed threatening process under the Act. The FPP is complemented by the Vertebrate Pest Program which addresses agricultural damage caused by feral animals.

3.1.4 COMMONWEALTH POLICY ON MULTIPLE LAND USE IN THE REGIONAL FOREST AGREEMENT PROCESS

In December 1996, the Commonwealth Government moved to ensure the conservation and

protection of dedicated forest reserves while allowing, subject to stringent environmental requirements, exploration and mining in forest areas of lesser conservation value.

The intent of the policy is that, as far as practicable, areas of high mineral prospectivity will be excluded from new reserves where such exclusions do not significantly compromise the JANIS reserve criteria.

The primary object of the CAR forest reserve system is to ensure the conservation and protection of environment and heritage values in dedicated reserves through State reserve tenures and management regimes. The CAR forest reserve system comprises both dedicated and informal reserves.

Dedicated reserves will be established where conservation values are incompatible with exploration and mining. Mineral exploration and mining may be allowed in those informal reserves where conservation values are compatible with exploration and mining, subject to individual environmental impact assessment. Rehabilitation of any mine site in an informal reserve must be to best international standards.

3.1.5 VICTORIAN LEGISLATION

The ***Land Act 1958*** governs the alienation and use of Crown lands, including the issuing of licences and leases for occupational use (other than timber harvesting). Such leases and licences may incorporate provisions relating to the protection and conservation of environmental values, including native vegetation and wildlife habitat.

The ***Forests Act 1958*** provides for the management of State forests, protection of these and other public and private lands from fire, development of working plans and the licensed sale of forest produce. Through its licensing provisions and regulations the Act also provides for control of recreational activities and other uses of forest land such as grazing. Under its powers for the making of regulations, the Timber Harvesting Regulations (1989) with its associated forest operator licensing have been implemented. These regulations are the authority for the Code of Forest Practices for Timber Production (NRE, 1996a). A 1991 amendment to the Act provides for the setting of hardwood sawlog volumes to be harvested in each Forest Management Area based on a forecast of the sustainable yield rate.

The ***Country Fire Authority Act 1958*** consolidates the law relating to the Country Fire Authority and confers on the Authority a responsibility to prevent and suppress fire on all land (urban and rural), other than unoccupied Crown land, outside of the Melbourne Metropolitan Fire District.

The ***Fisheries Act 1968*** covers the Commonwealth/State management of fisheries, commercial and amateur licences, fish culture, noxious fish research and development, enforcement and legal proceedings. A licence is required to fish in inland waters under this Act, including those within forested catchments. A new *Fisheries Act 1995* has also recently been passed, but is yet to be fully proclaimed. In the meantime, the provisions of the original Act continue to apply.

The ***Land Conservation Act 1970*** established the Land Conservation Council as an autonomous body to carry out investigations and make recommendations to Government on ‘the use of the public land in order to provide for the balanced use of land in Victoria’. In so doing, the Council must have regard to the present and future needs of the community for preservation of areas of conservation and recreation value, reserved forest and areas required by government departments and public authorities. The Council must take into account the

social and economic implications of its recommendations.

The Council's membership includes non-government representation and its land-use planning process incorporates legislated opportunities for public consultation and comment. Since its inception in 1970, the area of land incorporated in formal Parks and reserves has grown from less than 1 per cent of Victoria's total land area to over 15 per cent today.

Legislation has recently been passed by the Victorian Parliament which replaces the LCC with a new land use planning body known as The Environment Conservation Council (ECC). The new Council is discussed further in Section 2.1 of this report.

The ***Environment Protection Act 1970*** establishes the Environment Protection Authority as an independent statutory body and provides it with powers, duties and functions on lands of all tenures concerning the protection of receiving environments (air, land and water), control of noise and pollution.

The *Archaeological and Aboriginal Relics Preservation Act 1972* provides for the protection and reporting of Aboriginal places and relics in Victoria. It works in harmony with the Commonwealth *Aboriginal and Torres Strait Islander Heritage Protection Act 1984*, with the latter taking precedence when there is an overlap in provisions.

The ***Land Titles Validation Act 1994*** validates, in accordance with the *Native Title Act 1993* of the Commonwealth, past acts that are invalidated because of the existence of native title. It also provides for compensation rights for the holders of native title which have been affected by past acts attributable to the State and to confirm certain existing rights.

The ***Land Conservation (Vehicle Control) Act 1972*** enables regulations to be made to control the use of vehicles on public lands, to prevent soil erosion and other environmental damage.

The ***Victoria Conservation Trust Act 1972*** establishes the Trust for Nature to encourage the acquisition of private land of significant conservation value and to assist in flora and fauna conservation. It also has provision for conservation covenants to be applied to land with significant conservation values. This may only occur with the landholder's consent and the approval of the Trust for Nature.

The ***National Parks Act 1975*** provides for the establishment, protection, management and appropriate use of national, wilderness, State and other parks. Its objectives are to protect the natural and cultural values of the State's system of parks, many of which are forested, and to provide the community with appropriate opportunities for enjoyment, recreation, education and research. It also provides the preparation of management plans and the granting of leases, licenses and permits for various activities in parks .

The ***Wildlife Act 1975*** provides for the establishment and management of State wildlife and nature reserves, licences, research and management, wildlife management cooperative areas, prohibited areas and sanctuaries, declaration of noxious wildlife, offences, enforcement and legal proceedings.

The ***Environmental Effects Act 1978*** provides for the assessment of potential environmental impacts of proposed developments on land of all tenures. Major instruments and control mechanisms are Environment Effects Statements and Ministers' Assessment Reports.

The ***Reference Areas Act 1978*** provides for the proclamation and management of

'Reference Areas' on public land. These are areas of ecological interest and significance which can serve as a reference for comparative assessment of impacts of land uses elsewhere. Their use is confined to scientific study. A Reference Areas Advisory Committee advises the Minister on how the areas should be protected, controlled and managed. The aim is to ensure that ecological processes within them continue unhindered.

The ***Crown Land (Reserves) Act 1978*** provides for the reservation of Crown lands for a variety of public purposes including flora and fauna conservation, and the appointment of Committees of Management by the Minister with delegated powers for leasing and licensing.

The ***Conservation, Forests and Lands Act 1987*** formally transferred the responsibilities of a number of former statutory bodies to the (then) new Department of Conservation, Forests and Lands resulting from machinery of Government changes. This single, integrated public land management agency (and its successors) have been responsible for the management and protection of the State's public lands including State forests (both native and exotic), National Parks and reserves, wildlife (including commercial fisheries) and other public lands, in addition to private land catchment protection functions.

The Act provides legislative backing for Codes of Practice which govern activities on public and private lands, under which the Code of Forest Practices for Timber Production and Code of Practice for Fire Management on Public Land have been developed. It also provides for the establishment of 'conservation covenants' on private land titles in order to protect important environmental values.

The ***Planning and Environment Act 1987*** establishes a framework for integrating policies and environmental considerations into planning decisions affecting private lands across the State. It establishes local, regional and State sections in planning schemes into which appropriate controls on the use, development and protection of land can be incorporated through instruments such as planning schemes, planning permits and landowner agreements. The objectives of the Act include provision for the protection of natural processes and genetic diversity, and to conserve places of scientific, aesthetic or special conservation value. It requires Responsible Authorities (usually local governments) to administer and enforce planning schemes, under which applications for planning permits may be referred to other relevant authorities to stipulate permit conditions or the grounds for permit refusal. Refer to Native Vegetation Retention and Plantation Controls (Section 1.5).

The ***Flora and Fauna Guarantee Act 1988*** is the central legislative tool for conservation of biodiversity in Victoria on all land tenures. It provides legal powers and management systems to protect and manage the State's native plants and animals, including their potential for evolutionary development in the wild. Major instruments include the listing of threatened species and communities, and threatening processes, the development of Action Statements, controls over the taking, trading and keeping of native species, and the use of Interim Conservation Orders for the urgent protection of areas facing immediate threats. It also establishes a framework for public participation, community education, assistance and incentives for the conservation of native flora and fauna and community efforts in nature conservation.

The ***Water Act 1989*** establishes rights and obligations in relation to water resources, provides mechanisms for the allocation of water resources (including to the environment), governs the statutory powers and functions of water authorities outside the metropolitan area and provides for integrated management of water resources for environmental and consumer protection.

The purpose of the ***Mineral Resources Development Act 1990*** is to encourage and facilitate exploration and mining in Victoria. It provides for the granting of licences and approvals to explore and extract minerals. Three categories of public land have varying levels of exemption from exploration or mining activity. The Act has provisions for environmental care, rehabilitation and monitoring of mining and mineral exploration.

The ***Heritage Rivers Act 1992*** establishes a number of Heritage Rivers and Natural Catchment Areas on public land which have significant nature conservation, recreation, scenic or cultural heritage values. The Act specifies restricted or specific uses for particular heritage rivers and activities which are not permitted in natural catchment areas. It also requires that a management plan be prepared for each area.

The ***Victorian Plantations Corporation Act 1993*** confers operational and administrative powers on the Victorian Plantation Corporation, a statutory corporation established under the *State Owned Enterprises Act 1992*. The Corporation is responsible for the management and protection of certain State-owned plantation timber resources.

The ***Forestry Rights Act 1996*** entitles a "Forest Property Owner" to have ownership of trees vested in him/her by the "Owner" of the land in which they have been planted. The Act separates ownership of the land from the ownership of the trees on that land and provides legal security to the "Forest Property Owner". Under Section 5 of the Act, the "Owner" of the land may enter into a "Forest Property Agreement" with the "Forest Property Owner" under which the "Owner" grants the right to plant, maintain and harvest "forest property" (being all parts of trees and the products of trees whether or not those products have become separated from those trees prior to being harvested.

The ***Catchment and Land Protection Act 1994*** establishes an administrative framework for advising Government on the integrated management and protection of catchments on all land tenures across the State. It establishes processes to encourage and support community participation in the management of land and water resources through the establishment of a State-wide Catchment and Land Protection Board, ten regional Catchment Management Authorities and a Pest Animal Advisory Committee. The Act consolidates functions relating to the identification, proclamation and management of water supply catchments previously performed under the *Soil Conservation and Land Utilisation Act 1958* (repealed) and the *Land Conservation Act 1970*.

The objective of ***Extractive Industries Development Act 1995*** is to facilitate and streamline the planning and approvals processes on public and private lands for the removal of extractive materials (eg stone). Environmental protection conditions may be specified at either the 'planning' or 'landholder' approval stages. The searching for stone is not permitted in reference areas, national, wilderness or State parks, and Aboriginal places and archaeological areas under specified legislation. The consent of the land owner (including the Crown) is required before a work authority can be issued for the extraction of stone. The National Parks Act prohibits consent being given for national, wilderness and State parks (except where a tenement or application pre-dates the park).

The ***Heritage Act 1995*** replaces previous legislation dealing with European heritage conservation. It covers a broad range of significant heritage places including historic and archaeological sites, precincts, gardens, cemeteries, shipwrecks and objects, buildings and structures. The Act establishes a Heritage Council which advises the Minister for Planning and Local Government and to determine which heritage places and objects are added to the Victorian Heritage Register. Only items of special significance to the history and development of Victoria are added to the Register.

The Act also establishes the Heritage Inventory which is a listing of all known historical and archaeological sites in Victoria regardless of their level of significance. All archaeological sites in Victoria are protected from unauthorised excavation or destruction. They can only be excavated or damaged with the consent of the Executive Director.

The ***Forests (Wood Pulp Agreement) Act 1996*** guarantees AMCOR Plantations Pty Ltd with a supply of residual logs for their pulp and paper mill at Maryvale until 2030. Logs are drawn from State forest in a supply zone that falls within Central Gippsland, Dandenong and Central Forest Management Areas.

The ***Forests (Pulpwood Agreement) Act 1959*** provides for supply of 70 000 tonnes of pulpwood annually to CSR Ltd, for a 50 year period from a specified zone.

3.1.6 VICTORIAN POLICIES

Timber Industry Strategy

The Timber Industry Strategy was released in August 1986. It established the basis for much of Victoria's existing approach to forest management and timber industry development. It is based on the recommendations of the Ferguson Board of Inquiry into the Timber Industry in Victoria (RAC, 1992). The Strategy provided a blueprint for sustainable forest management and timber industry development in Victoria. Consistent with the Strategy, forest management in Victoria is to be:

- economically viable with respect to the provision of wood and other market goods;
- environmentally sensitive with respect to the provision of non-market goods and services;
- sustainable with respect to the interests of future generations; and
- assisted by public participation in the planning process.

Action to achieve these goals has included:

- sub-division of the State into Forest Management Areas, within which licensed timber volumes are constrained to legislated sustainable yields;
- issuing long term (15-year) hardwood sawlog licences to provide certainty for investment by industry in further value-adding technology;
- planning and management through preparation of broadly based Forest Management and Wood Utilisation Plans, with significant opportunities for public input;
- preparation of the Code of Forest Practices for Timber Production and associated enforcement regulations;
- continuing research into the sustainability of alternative silvicultural systems and forest management practices; and
- development of a Rainforest Conservation Policy (outlined below).

A major thrust of the Strategy is the promotion of a sawlog-driven, high value-added, long-term employment maximising timber industry, which achieves the best end-use of wood harvested from the forest while protecting important environmental values.

Strategy for Conservation of Biodiversity in Victoria

Documentation which meets the requirements of the Victorian Flora and Fauna Guarantee Act and the National Strategy for the Conservation of Australia's Biological Diversity is due for completion in 1997.

Rainforest Conservation Policy

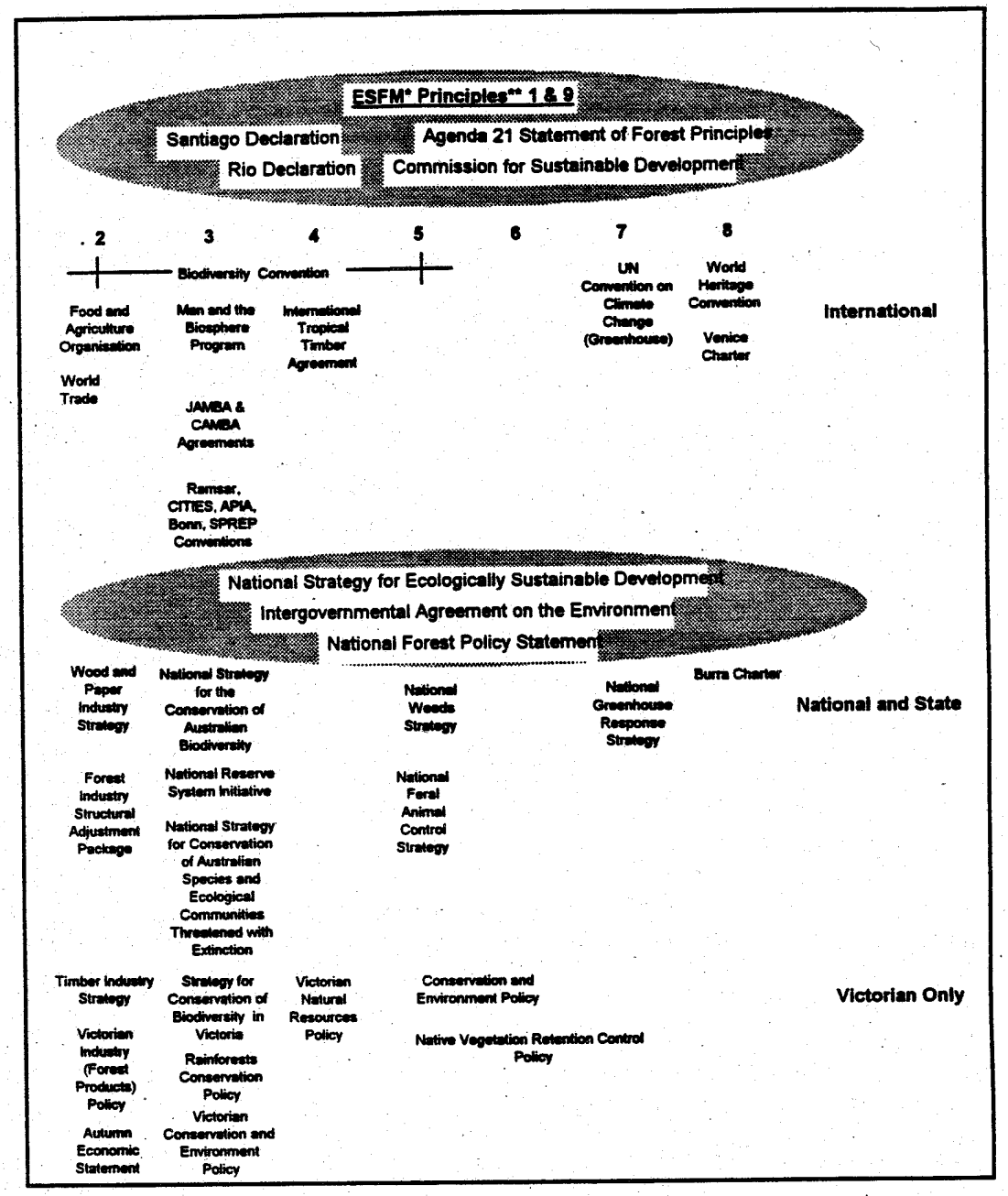
The document 'Victoria's Rainforests - An Overview' was prepared in 1987. It defines rainforest communities in Victoria, sets the major policy goals for rainforest conservation in Victoria and identifies a program of action to manage and protect rainforest. An independent review of these measures (Burgmann & Ferguson, 1995), identified areas for improvement, most of which have since been incorporated in relevant Forest Management Plans, the 1996 Code of Forest Practices for Timber Production, and NRE's research program.

Native Vegetation Retention Controls

These State-wide planning controls under the *Planning and Environment Act 1987* assist the protection and conservation of biodiversity, including native vegetation retention and the provision of habitats of native plants and animals, and the control of pest plants and animals. The application of these controls, which also affects private forestry operations, is described in Section 3.

State Environment Protection Policies

These policies are established by the Victorian Environment Protection Agency under the *Planning and Environment Act 1987*. Of greatest relevance to forest management is the Waters of Victoria Policy which sets water quality standards. It identifies run-off from agriculture and forestry operations as potential contributors to poor water quality, and encourages the use of best management practices in those areas.



*** ESFM - ECOLOGICALLY SUSTAINABLE FOREST MANAGEMENT**

** ESFM Principles: 1-maintain the full set of forest values for present and future generations; 2-maintain and enhance long term multiple socio-economic benefits to meet needs of societies; 3-protect and maintain biodiversity; 4-maintain the productive capability and sustainability of forest ecosystems; 5-maintain forest health and vitality; 6-protect soil and water resources; 7-maintain forest contribution to global carbon cycles; 8-maintain natural and cultural heritage values; 9-utilise the precautionary principle for prevention of environmental degradation.

Figure 3.1 Policy Instruments related to the principles of ecologically sustainable forest management

Table 3.1.1 Legislative Framework for Ecologically Sustainable Forest Management in Victoria.

LEGISLATION	PUBLIC LAND			PRIVATE LAND
PLANNING				
	National Parks and Reserves	State forests	Other land	
1. Land use	*Land Conservation Act 1970* *Crown Land (Reserves) Act 1978*			*Planning and Environment Act 1987*
2. Land management	*National Parks Act 1975,* *Reference Areas Act 1978,* *Heritage Rivers Act 1992,* *Wildlife Act 1975*	*Forests Act 1958,* Code of Forest Practices 1996 *Reference Areas Act 1978* *Heritage Rivers Act 1992* *Wildlife Act 1975*	*Crown Land (Reserves) Act 1978,* *Land Act 1958* *Heritage Rivers Act 1992*	*Planning and Environment Act 1987*
3. Timber production	*Forests Act 1958*	*Forests Act 1958* (Amended 1990) Code of Forest Practices 1996	na	*Planning and Environment Act 1987* (Amended 1993) Code of Forest Practices 1996
4. Fire management	*Forests Act 1958*, Code of Fire Practice 1995			*Country Fire Authority Act 1958*
5. Threatened flora and fauna	*Flora and Fauna Guarantee Act 1988* *Commonwealth Endangered Species Protection Act 1992*			
6. Native vegetation clearance	*National Parks Act 1975; Reference Areas Act 1978; Wildlife Act 1975.*	*Forests Act 1958,* Code of Forest Practices 1996	*Crown Lands (Reserves) Act 1978; Land Act 1958*	*State Planning and Environment Act 1987*
7. Woodchip export licensing	na	*Commonwealth Export Controls Act 1982*	na	*Commonwealth Export Controls Act 1982*
Supporting Legislation				
1. State	*Environment Protection Act 1970; Archaeological and Aboriginal Relics Preservation Act 1972; Land Conservation (Vehicle Control)Act 1972; Victorian Conservation Trust Act 1972; Environment Effects Act 1978; Conservation Forests and Lands Act 1987; Water Act 1989 Mineral Resources Development Act 1990 Catchment and Land Protection Act 1994; Extractive Industries Development Act 1995, Heritage Act 1995.*			
2. Commonwealth	*Environment Protection (Impact of Proposals) Act 1974;Aboriginal and Torres Strait Islander Heritage Protection Act 19845; Australian Heritage Commission Act 1975; World Heritage Properties Conservation Act 1983*			
ADMINISTRATION				
1. Land Conservation Council	*Land Conservation Act 1970 -*			Planning and Environment Act 1987 - Dept. of Infrastructure
2. Department of Natural Resources and Environment	*Conservation, Forests and Lands Act 1987 -*			Planning and Environment Act 1987 - Dept. of Infrastructure
Supporting Agencies -				
Commonwealth	*Commonwealth Environment Protection (Impact of Proposals) Act 1974 -* Commonwealth Environment Protection Group, *Australian Heritage Commission Act 1975 - Australian Heritage Commission, Commonwealth Export Control Act 1982 - Department of Primary Industries and Energy*			

Assessment

Legislation and National and State polices provide a comprehensive framework for ensuring that all forest values are considered, assessed and afforded protection. In general, all the principles of ecologically sustainable forest management are met. On public land, legislation requires strategic land-use planning at the State/regional level right through to legally enforceable Codes of Practice at the operational level (eg Code of Forest Practices for Timber Production). On private land, the legislation requires regional level planning, adherence to the Code of Practice for Timber Production (Private Lands), and control of, for example, the clearance of native vegetation. In a number of instances, these arrangements are reinforced by legislation designed to safeguard particular values (eg Flora and Fauna Guarantee Act).

Review of legislation

In recent years, the Victorian Government has reviewed and consolidated a significant number of Acts relating to environmental issues, for example minerals and extractive industries, catchment and land protection, and water. This process should continue with consideration given to reviewing the *Forests Act 1958*. Potential conflicts arising because of separate legislation covering different forest values (eg management of biodiversity, fire) could be minimised through management protocols developed between the relevant agencies and, if necessary, through unifying legislation.

Revision of Commonwealth Acts such as the *Australian Heritage Commission Act 1975* and the *Environment Protection (Impact of Proposals) Act* should be considered in the light of current RFA processes to improve co-ordination of forest management, and especially to develop a jointly agreed approach to identifying and assessing heritage values that minimises the overlap and differences between Commonwealth and Victorian legislation.

Administration of Commonwealth and State legislation

The *Commonwealth Endangered Species Protection Act 1992* and Victoria's *Flora and Fauna Guarantee Act 1988* are adequate and appropriate for their purposes. In applying them, every effort should be made to address duplication.

The Commonwealth *Australian Heritage Commission Act 1975* and Victoria's *Land Conservation Act 1970, Archaeological and Aboriginal Relics Preservation Act 1972, National Parks Act 1975, Heritage Rivers Act 1992* and *Heritage Act 1995* establish processes to assess and identify natural, cultural and historic values of significance. However, the values recognised and the criteria for assessment differ which leads to different outcomes. This may be rectified by recent initiatives towards jointly agreed approaches to identifying and assessing heritage values.

Recognition of State processes

The process for assessing woodchip export proposals has not recognised Victorian legislation and planning processes to protect natural, cultural and indigenous values from the effects of timber harvesting. However, this issue is now being addressed through the RFA process.

3.2 PLANNING

3.2.1 LAND CONSERVATION COUNCIL STUDIES

Current public land use is the result of extensive processes undertaken by the Land Conservation Council (LCC) over the past 25 years. Strategic planning for the use of public land in Victoria has been undertaken by the Land Conservation Council under the authority of the *Land Conservation Act 1970*. The Council has carried out investigations, examined competing uses and made recommendations to the State Government on the way that public land could best be allocated to address the needs of those with legitimate interests and of the general community, and to provide for the balanced use of land in Victoria.

The Council divided Victoria into 17 study areas and, by 1986, had completed studies of all of them. It has also completed reviews of some study areas and undertaken several special investigations. Of these, some followed the usual format of a regional study embracing all values, others addressed a particular aspect of the natural or cultural environment.

Major features of the *Land Conservation Act 1970* included:

- opportunity for the public to participate directly in determining how public land should be used;
- publication of a background report, proposed and final recommendations;
- inclusion of experts from outside the public service on the Council so that external views can contribute to resolution of land-use issues;
- recommendations to have regard to the present and future needs of the people of Victoria with respect to the protection and use of the State's natural and cultural resources and to their social and economic implications;
- recommendations are tabled in both Houses of Parliament, which gives every Member the opportunity to raise land-use issues arising from them; and
- implementation provisions directing Departments to give effect to the Government's land-use decisions based on the recommendations.

LCC investigations were initiated by directive of the Governor-in-Council. Following advertisement that an investigation is to commence, a study group was formed to assist in developing a resources report and proposed recommendations. The group comprised representatives from Government agencies who either manage public land or have statutory responsibilities for the land under study, as well as some non-government members.

Frequently, where key information is not available, research was commissioned to fill the gaps.

A resources report describing the natural, economic and cultural resources, characteristics and uses of the study area was published. It provided up-to-date and detailed information about soils, climate, water resources, flora, fauna and land systems as well as the range of uses made of the land. A submission period of 60 days followed its publication. Submissions assisted the Council to identify issues which relate to the particular study area and also frequently provided new information.

Proposed or interim recommendations were drafted in the light of the resources information,

the first round of submissions, discussions with individuals and groups (both in the study area and in Melbourne), and with technical input from the working group. The Council also visited the study area and participated in public meetings, seminars and personal consultations. A second submission period of 60 days followed publication of the proposed recommendations.

After review of the second set of submissions and other relevant information, final recommendations were presented to the Minister, published, and tabled in both Houses of Parliament. The Government then decided whether to accept, modify or reject the recommendations.

Implementation of approved recommendations may occur by: legislation (such as inclusion of land in parks on the relevant schedule to the *National Parks Act 1975;* reservation under the *Forests Act 1958* or *Crown Land (Reserves) Act 1978*; proclamation under particular statutes (such as the *Reference Areas Act 1978*); or inclusion in the zoning system for State forest or other public land. Other recommendations may relate to how an area should be managed, rather than require reservation.

The LCC considered that a review of each study area may be warranted every ten years, depending on the amount of new information which it has accumulated since the last study.
A measure of the effectiveness of the Council's work is the number of recommendations accepted by Government. The Council's 1994-95 Annual Report notes that, of 5745 recommendations subject to Government decision, only 104 were modified and only 131 were not accepted.

Legislation has recently been passed by the Victorian Parliament to replace the Land Conservation Council with a new body, 'The Environment Conservation Council', whose task will be to "conduct investigations into the balanced use or development of public land within the State or any flora, fauna or minerals on, above or under that land or water flowing over that land".

The new Act provides for the establishment of the new Council, its membership, functions, powers and processes involved in the conduct of investigations. The new Council is expected to commence operation on 1 July 1997.

The establishment of the new Council has been driven by the need to review the role of the State's land use planning body to face the challenges of the future and changes in the administrative framework that existed in the past.

Assessment

Land Conservation Council studies have collected and assessed available information thoroughly, provided significant opportunities for public input, and ensured a balanced allocation of forested public land between resource use and conservation on a broad regional scale. The allocation of public land achieved through these studies addresses all assessment criteria and provides a sound basis for ESFM in Victoria.

Once the boundaries of the National Reserve System are determined, mechanisms need to be developed to accommodate long-term changes in landscape dynamics through removal, exchange, or addition of areas on or near the boundaries. These mechanisms for periodic changes should seek to maintain adherence to the reserve criteria and the level of the sustainable yield but provide sufficient flexibility to accommodate new information.

3.2.2 STATE FOREST PLANNING

Forest management plans

Forest management plans are prepared by the Department of Natural Resources and Environment to meet the Victorian Government policy requirement that forest management be economically viable, environmentally sensitive, sustainable for all forest values, and assisted by public participation in planning. They apply to State forest areas delineated following government consideration of LCC recommendations.

The objectives and scope of forest management plans are described in the Code of Forest Practices for Timber Production which specifies that they should:

- provide for the protection of regional biodiversity;
- provide protection for all flora and fauna listed as threatened under Victoria's Flora and Fauna Guarantee Act 1988;
- meet the requirement for sustainable yield under Victoria's Forest Act 1958;
- identify regional environmental, cultural and resource values and develop specific management aims, guidelines and actions for their management and protection;
- consider resilience, extensiveness, distribution, and natural processes in determining protection for individual environmental values;
- sub-divide State forest into zones, identifying where environmental, cultural and resource values are given priority;
- link conservation reserves with special protection and special management zones where protection of environmental values is given highest priority;
- provide opportunities for recreation, scientific study and education and specify separate objectives for these values;
- identify areas where regrowth stands can be managed more intensively by thinning and/or fertilisation to increase production of timber;
- identify areas which should be re-afforested;
- include public participation through advisory committees and opportunity to comment on proposed plans; and
- provide for periodic review and mechanisms for adjustment when new scientific data become available.

Plans include guidelines, targets and actions which provide a benchmark for monitoring Plan implementation. Forest Management Plans specify that an annual report on their implementation be prepared.

Management plans apply for ten years, but there is provision for review earlier if required. Management guidelines and management zones within plans are reviewed as new information or circumstances come to light. This is intended to occur through ongoing multidisciplinary planning, building on the existing annual Wood Utilisation Planning process.

Plans have been completed for the Otways (DCE, 1992a), East Gippsland (CNR, 1995a) and Midlands (NRE, 1996b). A proposed plan for Central Highlands was published for public comment in December 1996. A proposed plan for Mid-Murray will be published for public

comment in 1997. Work is currently proceeding on a Plan for North-east Victoria. It is intended that forest management plans will be completed for the remaining Forest Management Areas. Where forest management plans are not in place, forest is managed according to approved LCC recommendations and NRE policy and guidelines. In such areas, the preparation of the Wood Utilisation Plan assumes a more important role. The Wood Utilisation Plans are prepared by a multi-disciplinary team and must take account of all available information on timber, flora, fauna, catchment, land protection and cultural values.

Code of Forest Practices for Timber Production

The Code of Forest Practices for Timber Production ('the Code') applies to commercial timber growing on public and private land. This section describes its application on public land, principally State forest. Its application on private land is described in Section 2.4.
The Code was established in May 1989 (CFL, 1987) under Section 55 of the *Conservation, Forests and Lands Act 1987*. A revised Code which takes account of new research information and field experience came into force in February 1997 (NRE, 1996a).

Development of the Code involved extensive community input. This included individual stakeholder and group submissions, input from scientific bodies and formal panel hearings. For the recent review of the Code a consultant (CSIRO Division of Forestry and Forest Products) was engaged and a 'Proposed Code' produced for public comment (CNR, 1995b). The consultant's reports (CSIRO, 1995) and public submissions were taken into account in producing the revised Code.

The Code lays down Statewide goals and guidelines that apply to timber harvesting, timber extraction and roading, regeneration and reafforestation in native forests, as well as to the establishment and tending of softwood and hardwood plantations. It ensures that:

- land managed for timber production is adequately regenerated and tended following timber harvesting;
- reafforestation is achieved efficiently and with environmental care;
- environmental values (including soil, landscape, flora, fauna, archaeological, historic and cultural values) are conserved, and water catchments protected; and
- opportunities are provided for recreation, scientific study and education.

The principles and guidelines in the Code are also aimed at meeting the objectives of the State Environment Protection Policy for the Waters of Victoria.

The guidelines given in the Code are designed as Statewide minimum standards and therefore cannot include detailed prescriptions that address regional variation in climate, forest type, topography, elevation, soil type and management objectives. While the Code includes some prescriptions which establish Statewide minimum standards (eg minimum width of streamside buffers, maximum grades of roads), it also specifically requires that these be supplemented by regional prescriptions that take account of local conditions, and that Forest Coupe Plans prepared for each harvesting site include additional protection measures as appropriate.

Compliance with the Code on public land is required under the conditions of licences issued under the provisions of the *Conservation, Forests and Lands Act* 1987 and the *Forests Act* 1958, and other licences and authorities under related Acts.

The Code is to be reviewed at least every ten years to take account of new scientific information and field experience.

Regional Prescriptions

Regional Prescriptions are developed by departmental staff following consultation with industry groups and other interest groups as appropriate. Development of regional prescriptions is based on research information and operational experience. There are two types of regional prescriptions: Operator Prescriptions and Management Prescriptions.

Operator Prescriptions advise forest operators (private sector) and NRE supervisory staff on environmental standards to be met in the harvesting of forest coupes and road construction and maintenance. Adherence to Operator Prescriptions is a requirement of the Timber Harvesting Regulations.

Management Prescriptions are intended to be used by departmental staff for planning and implementation. They apply to coupe planning, area exclusions, road construction and maintenance, the establishment, tending and harvesting of forest stands, Action Statements and special protection plans. Management Prescriptions are currently being developed and/or updated in most Forest Management Areas (FMAs). They are written mainly as an internal guide to the conduct of forest management operations.

NRE also produces technical guidelines on how to achieve the outcomes specified in Regional Prescriptions. For example there is a series of silvicultural guidelines covering the collection, extraction and storage of seed, planting of coupes, and the thinning of regrowth forests.

Management and operator prescriptions are continually reviewed by regional staff on the basis of local experience, the outcomes of research, and the recommendations of various working groups such as the five Research and Development Action Groups which cover Victoria.

Sustainable Yield Regulation

The *Forests Act 1958*, as amended by the *Forests (Timber Harvesting) Act 1990,* requires the harvesting of sawlogs from State forest to be conducted on a sustainable basis within each of 15 FMAs. The Act specifies that the 'Hardwood Sawlog Supply Level' for each FMA must be within 2 per cent of its 'Sustainable Yield Rate' over a 15-year supply period.

The Sustainable Yield Rate is defined as the '*estimated annual rate of harvesting of hardwood sawlogs that is capable of being produced without impairment of the long term productivity of the land, taking into account the structure and condition of the forest'*. Forecasts of sustainable yield depend on:

- the area available for sawlog production (set by Forest Management Plans);
- the area and estimated sawlog volume of mature and overmature forest stands that are suitable and available for sawlog production;
- the area, age, and estimated growth rates of regrowth forests that are suitable and available for sawlog production; and
- the specified silvicultural regimes and rotation age are set out in Forest Management Plans and the Timber Industry Strategy (Government of Victoria, 1986) respectively.

This information is used to create a theoretical harvesting schedule which provides for an optimal, non-declining supply of sawlogs over time. The long term aim is to maximise sawlog productivity from the available area of State Forest by creating a balanced distribution of forest stands in different age classes.

The process of sustainable yield forecasting is highly technical and there is no direct public participation. However, the data on which the forecasts are based and the methodology used are published (eg CNR 1995a, NRE 1996a). An independent review of sustainable yield forecasting for East Gippsland is provided in the East Gippsland Resources and Economics Report (VicRFASC, 1996a).

Timber resource information is stored in the Hardwood Area Resource Information System (HARIS) which is a compilation of data from timber assessment projects conducted over many years. The reliability of HARIS data varies according to whether areas have had intensive forest inventories, reconnaissance surveys or desk studies. Victoria is currently conducting a major review of all its timber resource information in a large project called the Statewide Forest Resource Inventory (SFRI). The SFRI is progressively mapping the forests of Victoria, and conducting inventories to refine knowledge of the existing timber resource as well as its growth and yield.

The *Forests Act 1958* requires that sustainable yield for each FMA be reviewed every five years or when new information is available. Each review takes account of new information such as changes to the land base for timber production (made through Forest Management Plans or other Government decisions), changes to timber resource information (for example new SFRI data), or changes wrought by major natural disturbances (such as wildfire or outbreaks of pests and diseases).

Wood Utilisation Plans

Areas available for timber harvesting are set by Forest Management Plans where they exist, and regional timber supply levels are set in accordance with the sustainable yield rate. The quality and quantity of logs supplied to sawmills is specified in log licences. The licences also specify that by March each year licensees must be supplied with a Wood Utilisation Plan (WUP) specifying where, and under what conditions, their next year's supply of logs can be harvested.

Accordingly, each year the Department prepares a rolling, three-year WUP for each FMA. It shows the coupes from which individual licensees, harvesting syndicates/groups or NRE, under contract logging, can obtain logs for the coming year, and an indication of the coupes for the subsequent two years. It also shows extraction routes, new roads to be constructed, and the location of coupes for the harvesting of minor forest timber produce (eg firewood and sleepers).

WUPs take account of all available information on timber, flora, fauna, catchment, land protection and cultural values and are prepared in consultation with expert staff. This is generally a more complicated process where Forest Management Plans have not been prepared.

Drafts of the WUP are circulated to key interest groups for comment and they are also made available for inspection. Following consideration of the comments received, the final WUP is approved and supplied to licensees.

Forest Coupe Plans

In accordance with the Code, individual coupe plans must be prepared and approved prior to all timber harvesting operations. These are prepared with reference to higher level regional plans which address coupe siting, water quality protection, roading, flora and fauna conservation (Forest Management Plans and Wood Utilisation Plans), and any other relevant plans and prescriptions.

Coupe Plans usually have three parts:

- operational requirements - including prescriptions with which the contractor must comply, a coupe map and a logging completion certificate;
- silvicultural and regeneration requirements; and
- records to be kept and monitoring and remedial actions.

Compliance with the Code, Regional Prescriptions and the Coupe Plan is monitored during the harvesting operations. A coupe completion certificate is issued following satisfactory compliance with the plan including draining of major snig tracks and rehabilitation of log landings.

Plans for the construction of roads associated with harvesting are also the subject of a Coupe Plan, and for this purpose a road is treated as a coupe. Road maintenance requirements are addressed through ongoing works programs.

Log grading

The Department has a log grading system designed to encourage value adding and to maximise the economic and social benefits from the timber resource. All logs harvested are graded, according to their species, size and amount of defect, into one of four sawlog grades or as residual logs. Logs are then separated by grade on forest coupes and transported to sawmills based on licensed agreements with the Department. Higher grade logs are sold at higher royalty rates. Grade segregation techniques vary across FMAs, and there is a move to adopt sale-by-weight and sample grading. Log grading is carried out by accredited log graders employed by the timber industry. Over the past few years there have been two audits of log grading which have led to a number of enhancements to procedures.

Assessment

Forest Management Plans

Forest Management Plans provide a strong basis for achieving ecologically sustainable forest management. The plans specifically address parks and State forests, but take account of all tenures in their attempt to balance resource use with other conservation and management requirements. Where forest management plans are not in place, the forest is managed according to approved LCC recommendations and NRE policy and guidelines. In such areas, the preparation of the Wood Utilisation Plan assumes a more important role.

Strengths of forest management plans include:

- variation of the extent of reservation of Ecological Vegetation Classes in relation to rarity and other indicators of risk so that values sensitive to many forest practices (eg rainforest and heathland) are given high levels of protection;
- the capacity to amend management zone boundaries to accommodate new information;
- application of management prescriptions to ameliorate threatening processes in forests managed for timber harvesting; and
- many opportunities for public input in the planning process.

Areas for improvement are:

- More thorough treatment of socio-economic factors in forest management plans.
- A formal approach to risk assessment at the start of the planning process and at periodic

reviews. This would give greater confidence in the measures taken to ameliorate risk and to identify better the need for research into new types of information. (For example, research is needed into habitat requirements of fauna and flora and responses of key groups to potentially threatening processes associated with the management of forests on all land tenures. Greater use of external scientific expertise would facilitate this process.)

- Recognition of the contribution of all forest areas to regional conservation goals. (For example, the contribution of the General Management Zone needs to be more explicitly factored into conservation strategies.)
- Development of flexible corridor networks to accommodate changes in habitat where necessary.
- A more comprehensive set of performance indicators against which implementation of the plan can be assessed.
- Inclusion of targets for soil and water quality.
- More explicit targets, against which the effectiveness of plans can be measured.
- More detailed strategies for identifying and protecting cultural heritage values, including Aboriginal sites.
- Better links between forest management plans, local government planning and cross-border regional planning for industry, tourism, recreation and catchment management. Significant changes in industry opportunity (eg value-adding, pulpwood utilisation, tourism) should trigger re-examination of forest management plans.

Code of Forest Practices and Regional Prescriptions

The Code and associated prescriptions applied within the land use framework established by the LCC and FMP processes provide a sound basis for ecologically sustainable forest management.

Areas for improvement include:

- More research to progressively strengthen the scientific basis of the Code guidelines; for example, continuing research into the development of indicators of soil damage caused by harvesting machinery.
- Further work to develop regional prescriptions that build on Code standards to take account of local factors such as soil types and climatic conditions.
- Selective monitoring to confirm the effectiveness of prescriptions and to provide a basis for their improvement.
- Expansion of guidelines for the management of Aboriginal sites.

Sustainable Yield

The adequacy of the existing process for estimating sustainable yield in those areas with a forest management plan has been reviewed as part of the East Gippsland (VicRFASC 1996a) and Central Highlands RFA processes. Procedures and data for achieving these estimates are coarse at present but uncertainties are accounted for by making conservative estimates of sustainable yield.

The process should continue to be as transparent as possible subject to commercial confidentiality. It should continue to seek input of the best available specialist expertise from within and outside the Department of Natural Resources and Environment, and include regular reviews as legislated in relation to monitoring indicators of ecological sustainability.

The fact that formal review of sustainable yield is a separate process to preparation of Forest Management Plans is seen by some community groups as a potential impediment to

achieving ecologically sustainable forest management. It should be recognised, however, that the five-yearly review of sustainable yield takes account of changes in the land base for timber production to meet conservation needs. Greater explanation of the procedure for estimating sustainable yield, and making the methodology and data used publicly available at an earlier stage than has occurred to date, would raise public confidence in this process. Moreover, sustainable yield and actual hardwood sawlog supply levels should be routinely reported and be publicly available.

3.2.3 PARK AND CONSERVATION RESERVE PLANNING

The National Park and reserve system, covering 3.7 million ha (16 per cent of Victoria overall and 40 per cent of public land), is largely the result of Victorian Government decisions following many studies by the Land Conservation Council of Victoria.

National Parks

Management plans for national, State and wilderness parks aim to conserve natural and cultural values while providing for appropriate use and enjoyment by the public. Plans for all National, State and Wilderness Parks reserved under the *National Parks Act 1975* are virtually complete. In accordance with the Act, park plans also provide for resource utilisation in some specific cases (for example, timber production in Barmah State Park and cattle grazing in the Alpine National Park).

National park and reserve plans are prepared by Parks Victoria and approved by the Director of National Parks and the Minister. Interest groups and the community are notified of the intention to prepare a plan and key groups (eg the Victorian National Parks Association, and the Victoria Association of Four-wheel Drive Clubs) are consulted during the process. Proposed plans are published and submissions invited. All submissions are considered in preparation of the final plan.

National park and reserve plans draw on extensive natural resource data, although the degree of detail and coverage varies. In recent years there has been greater recognition of the value of comprehensive resource information covering all public land tenures. For example, Ecological Vegetation Class and old-growth forest mapping projects cover all public land.

There is a comprehensive ‘Guidelines and Procedures Manual’ to provide a consistent Statewide approach for staff in planning and management of parks. The manual is based on legislation and extensive consultation within the Department. Particular attention is paid to protection of sensitive environmental and cultural values. Individual guidelines are continually reviewed.

The plans provide the basis for the preparation of implementation programs against which the effectiveness of plan implementation can be assessed. In the past, park plans have tended to be prepared without considering the broader contribution to regional conservation or other goals. Planning processes for all parks need to be refined to consider regional goals and to identify more specifically the particular goals for the individual park and the strategies for achieving those goals.

Reference Areas

Reference Areas are tracts of public land identified by the Land Conservation Council as relatively undisturbed examples of land types representing the major land types found in the State. These major land types have often been modified elsewhere for productive uses such as agriculture, mining or intensive timber. These Areas are intended as a reference against

which the cause and effects of human alteration and utilisation can be measured. Reference Areas are proclaimed under the *Reference Areas Act* 1978. They are managed in accordance with Ministerial directives and a Department of Natural Resources and Environment guideline which requires a short management statement to be prepared if a management plan does not already exist. Of the138 Reference Areas in Victoria, 108 have been proclaimed and 64 have management plans.

Reference Area planning does not involve formal public consultation because such areas are not available for general public access or use. Liaison with individuals affected by the proclamation and management of Reference Areas is undertaken as needed. Reference Area plans are available to the public on request.

Heritage Rivers and natural catchment areas

Following a special Statewide investigation into rivers and streams LCC (1991) the *Heritage Rivers Act 1992* was enacted, leading to designation of 18 Heritage Rivers and 26 Natural Catchment Areas across Victoria.

Heritage Rivers and Natural Catchment Areas are an 'overlay' on the existing land tenure which remains unchanged. Consequently there are Heritage Rivers and Natural Catchment Areas in State forest, parks, conservation reserves and other tenures. However, the management of those areas must be consistent with the requirements of the Heritage Rivers Act. The zoning of Heritage Rivers and Natural Catchment Areas in State forest is determined by forest management plans. In most cases they are, or will be, Special Protection Zones. The Act also requires that a management plan be prepared for each Heritage River and Natural Catchment Area by September 1997, involving public consultation.

Other conservation reserves

Victoria has 3000 additional conservation reserves including regional parks, flora and fauna reserves, bushland reserves, coastal reserves, lake reserves and many other categories. While management plans have not been prepared for most of these reserves, they are managed by NRE in accordance with relevant LCC recommendations, policies and guidelines.

Assessment

While improvements in reserve planning are being implemented, the following areas need to be addressed:

- setting of clear and strategic goals for the conservation of biodiversity (or other express purposes of reservation) that are realistic in relation to available resources and against which the success of management can be judged;
- a procedure for monitoring implementation of plans;
- consideration of the collective contribution of parks to regional conservation (or other express purposes of reservation); and
- wider use of Reference Areas for long-term comparative studies on the impacts of human disturbance in other forested areas.

3.2.4 PRIVATE LAND

Some twelve per cent (605 000 hectares) of Victoria's native forest occurs on private land. Conservation and sustainable management of these forests is promoted by fostering an appreciation of environmental values amongst landholders through education and

cooperative programs. These initiative are supported by formal controls over clearing of native vegetation, the conduct of private forestry operations, and the protection of flora, fauna and water quality.

Education and cooperative programs

The Landcare program grew out of a 1986 departmental and ministerial initiative with the farming community. It aims to promote sustainable agriculture, protection of remnant native vegetation and revegetation of degraded areas in rural Victoria. The program operates through 600 'grass roots' Landcare groups across Victoria. Under the national Landcare program the Commonwealth provides funds for the activities of Landcare groups.

The 1990 Tree Victoria Action Plan has a goal of planting 100 million trees by 2101, by: direct seeding (11.6 million trees per year); expansion of forest areas; and increases in hardwood and native softwood plantations. This will be achieved by local government and community groups including Landcare and Farm Tree Groups through five major strategies: Vegetation Retention, Revegetation, Trees on Farms, Agroforestry and Commercial Forestry.
Through the "Land for Wildlife" program NRE encourages protection and enhancement of wildlife habitat on private land. Landowners participating in the scheme get a "land for wildlife" sign to display on their properties and receive newsletters offering advice on wildlife habitat management. So far 3900 properties have been registered under the program.

The Victorian Trust for Nature established under the *Victoria Conservation Trust Act 1972* also plays a significant extension role on private lands. The Trust promotes conservation of significant natural areas through contact with landholders, land exchanges, land purchases, and facilitating the placement of conservation covenants on land titles.

Catchment Management Authorities provide a focus for coordination of the above activities and establishment of priorities in a regional context.

Formal controls for management of native vegetation on private land

Formal controls relevant to private land vegetation management include the Native Vegetation Retention Controls and the Code of Forest Practices for Timber Production (which have their authority through the State Section of all Planning Schemes), and the Waters of Victoria State Environment Protection Policy (which has its authority through the Victorian *Environment Protection Act 1970*). Some powers under the *Flora and Fauna Guarantee Act 1988* are also relevant to forest management on private land.

Planning Schemes established for local government areas in accordance with the *Planning and Environment Act 1987*, make provision for the use, development or conservation of land. Before issuing a permit, the responsible authority (usually the municipality) must consider any significant effects which that use or development may have on the environment.

The municipality is responsible for enforcement of planning scheme provisions and permits by 'enforcement orders', and subsequent recourse to the Administrative Appeals Tribunal.

Native vegetation retention controls

In 1989 the Victorian Government introduced controls on the clearing of native vegetation on private land. The controls, which took the form of amendments to the State Chapter of planning schemes, form part of a coordinated program including financial assistance, information and education, and voluntary covenants.

The controls involve restrictions on the clearing of native vegetation other than for specified purposes, such as the building of a residence. Controls do not apply to land less than 0.4 ha, but any vegetation removal not otherwise exempt is subject to control. NRE is a formal referral authority for clearing in excess of 10ha, or where the planning authority itself wishes to clear vegetation. In these cases, the planning authority is required to adapt NRE's decision in relation to these permit applications. Both the applicant and any objectors to a proposal have recourse to the Administrative Appeals Tribunal if they are not satisfied with the decision of the responsible authority or the subsequent implementation of the decision.

In addition to its capacity as a referral authority, NRE provides advice to developers and planning authorities on the values of areas proposed for clearing and recommendations as to whether clearing should proceed. NRE monitors the actions of permit-holders, and, using remote sensing, the overall changes in native vegetation cover.

Ideally local government decisions about the management of native vegetation should be made in the context of specific local policies or regional conservation plans. Some municipalities (eg Shire of Yarra Ranges) have developed such plans, but most have not. However the Catchment Management Strategies under preparation by Catchment Management Authorities across Victoria (see Section 3.2.6) will provide a regional context for implementation of the clearing controls. All planning schemes are under review, and the revised schemes will incorporate these strategies.

Code of Forest Practices for Timber Production (Private Land)

The Code of Forest Practices for Timber Production (the Code) applies to both public and private land. In October 1993 the State section of all planning schemes was amended to:

- require compliance with the Code in relation to private land timber production operations;
- encourage the establishment of plantations in Victoria; and
- balance the need to preserve stands of important remnant native vegetation with the need to encourage the expansion of Victoria's privately owned plantation estate.

The Code applies to operations on private land where forests are managed. This includes the establishment, tending and harvesting of native forest and softwood or hardwood plantations and associated roading. Agroforestry, amenity plantings and small woodlots are exempt.

Timber Harvesting Plans must be prepared for each harvesting site and a plantation development notice lodged with the responsible authority before harvesting. The Plan includes any environmental protection measures required for the coupe. NRE can help landholders to prepare the Timber Harvesting Plan. Responsibility for ensuring compliance with the harvesting plan rests with the municipality (see Section 3.2.5).

Waters of Victoria State Environment Protection Policy

Under this policy a pollution abatement notice can be issued to individuals or agencies failing to control runoff that is leading to unacceptably high stream sediment levels. This can happen, for example, if road construction and maintenance or harvesting operations on private land are poorly managed. The Code of Forest Practices for Timber Production is aimed at preventing such occurrences.

Flora and Fauna Guarantee

This Act includes controls over the 'taking' of protected flora. On private land most flora is

exempt from the controls except for selected species subject to commercial harvesting. In these cases a permit from NRE is required. The aim of the control is to promote sustainable harvesting practices. At present Grass-trees, Tree-ferns and *Sphagnum* moss species fall into this category. The list of species to which the controls apply can be changed by Governor in Council Order, depending on the level of interest in commercial harvesting and the significance of any sustainability issues.

Other powers of the act come into force if an area is declared to be the Critical Habitat of a species or ecological community. Permits are required for the taking of flora from private land which is part of a designated Critical Habitat. Where a species listed under the Act is facing an immediate threat in part of its Critical Habitat, the Minister can apply an Interim Conservation Order (ICO) to halt or control the harmful activity. ICOs are an emergency measure which can remain in place for up to two years while a permanent solution to the issue is worked out. Permanent solutions may take many forms, but voluntary cooperation with the landholder or affected party will be most keenly sought.

Persons seeking to export flora and fauna products from public or private land must meet the requirements of the *Commonwealth Wildlife Protection (Regulation of Exports and Imports) Act 1982.* The Act requires that harvesting activities be subject to an approved management regime before the export of products can be authorised. In collaboration with the Commonwealth, Victoria is currently preparing management programs for the commercial harvesting of Soft Tree-ferns (*Dicksonia antarctica*) or flowers and foliage from both public and private land. The programs will meet the requirements of both this act, and the *Flora and Fauna Guarantee Act 1988*. Within two years it is intended to prepare programs covering harvesting of all flora.

Assessment

The Native Vegetation Retention Controls, Flora and Fauna Guarantee and the Code provide mechanisms for protecting environmental values on private land, their implementation lacks coordination. Strategic regional plans which address flora and fauna conservation issues are required to ensure that their implementation is coordinated and directed towards clear conservation goals or other relevant goals. Catchment Management Strategies may well fulfil this role but are not yet well-developed.

Local government is usually the responsible authority for implementation of Native Vegetation Retention Controls. Local government often does not have the expertise to implement these controls, nor to assess cultural and heritage values, or to monitor compliance with permit conditions. Continued improvement in this area is necessary.

3.2.5 PLANTATIONS AND FARM FORESTRY

Hardwood and softwood plantations cover 250 000 ha in Victoria. Of this area 120 000 ha (110 000 softwood and 10 000 hardwood) is on public land either vested in or leased by the Victorian Plantations Corporation, a Government Business Enterprise established under the *Victorian Plantations Corporation Act 1993*. The major pulp and paper companies, Australian Paper and Australian Newsprint Mills own 115 000ha between them, while the remaining 15 000ha is in smaller private holdings.

Victoria has established a high level task force to develop a private forestry strategy aimed at increasing the plantation development in line with the national target of trebling the plantation estate by the year 2020. The strategy is virtually complete.

NRE also has an ongoing program to facilitate development of the commercial private

forestry sector. While the emphasis of the program is on plantation establishment, the sustainable management of privately owned native forest is also encouraged. It aims to put private forestry on an equal footing with other primary industries by establishing suitable infrastructure and removing legal impediments. The program runs in conjunction with the farm forestry program which is being implemented as part of the national Wood and Paper Industry Strategy. Between 1996 and 2000, $15 million of Federal funds will be spent on demonstrations, community education, regional strategies, labour market programs and support for specific private forestry initiatives.

Under the *Planning and Environment Act 1987* and the new 'Victoria Planning Provisions 1997', plantations are considered as "crops" and can be established in the general Rural Zone without the need for a planning permit (except in some municipalities where permits are required for areas greater 40 hectares).

The establishment, tending and harvesting of all plantations on public or private land must comply with the Code of Forest Practices for Timber Production (see Section 3.2.2). Accordingly Timber Harvesting Plans must be lodged with the responsible authority (usually the municipal government). VPC and other large growers employ professionals to prepare these plans and to supervise field operations. Smaller growers can obtain assistance from NRE extension officers in preparing Timber Harvesting Plans that comply with the Code. In Gippsland a trial is underway whereby accredited forestry personnel are being used to ensure that Timber Harvesting Plans submitted to the responsible authority comply with the Code.

In order to facilitate the monitoring of the Code, a Plantation Development Notice must be lodged with the responsible authority prior to the commencement of site preparations when a plantation is being established for the first time.

Since April 1997, export controls have not applied to wood sourced from plantations in Victoria, subject to appropriate Codes of Forest Practice. Assessments carried out by CSIRO have concluded that the Codes applying to plantations in Victoria adequately protect environmental and heritage values.

Assessment

Current policy and programs are principally directed at improving and extending the plantation estate on private land and the economic returns and environmental and social benefits provided by plantations and trees on farms.

Expansion of the trial in Gippsland using accredited forestry personnel to ensure that harvesting plans comply with the Code, if successful, should be encouraged.

Further areas for improvement include:

- implementation of consistent approaches to auditing of compliance with the Codes on both public and private land;
- development of further practical guides and other material describing good forest practice, especially to assist small forest growers; and
- greater consistency in the interpretation of the Native Vegetation Retention Controls for plantation development.

3.2.6 CATCHMENT PLANNING

Under the *Catchment and Land Protection Act 1994*, nine Catchment and Land Protection Boards have been established to promote cooperation between individuals and bodies involved in the management of land and water resources, and to advise Government on catchment issues. A major task of the boards is to prepare Regional Catchment Strategies and to coordinate and monitor their implementation.

Catchment strategies will improve coordination of activities on public and private land so that, as far as practicable, their management is complementary. This is likely to be of greatest importance for:

- protection of stream values (such as protection and rehabilitation of the riparian zone, maintenance of environmental flows, and management of stream diversions and impoundments);
- pest plant and animal control to serve the interests of private landholders while helping to conserve biodiversity;
- coordination of Landcare initiatives and private forestry;
- monitoring of catchment values across all land tenures; and
- building community awareness of catchment values.

The Act strongly emphasises public consultation in development of the Catchment Strategies. The strategies' success will depend largely on the extent to which they address the concerns of landholders and build on the initiative and existing strengths of the community. Preparation of the strategies includes circulation of a background document and community consultation meetings.

Following a review of catchment management structures, the Victorian Government has announced that is will adopt the community-based service delivery model for catchments, described in the Review. This approach reinforces the role of Catchment Management Authorities (CMAs).

Catchment Management Authorities will be established in each of the nine non-metropolitan CALP regions. These Authorities will be responsible for:

- the development, ongoing review and coordination of implementation of the Regional Catchment Strategies;
- the provision of advice to Government on both Federal and State resourcing priorities at a regional level;
- the provision of all waterway and floodplain-related service delivery; and
- the negotiation with NRE of an annual project-based works program for regional service delivery which is in line with the implementation of the Regional Catchment Strategies.

The new CMAs will take on the roles of the current CALP Boards and waterway management authorities (WMAs). Therefore, these groups will no longer have the status of separate statutory bodies. The operation of the current CALP Boards will sunset in June 1997. The Boards of waterway management authorities will be reconstituted as Implementation Committees under the new structure.

The new Catchment Management Authorities are to ensure the sustainable development of natural resource-based industries, the protection of land and water resources and the conservation of natural and cultural heritage.

The major objectives are:

- to involve the community in decisions relating to natural resource management within their region;
- to promote sustainable development of natural resource-based industries;
- to collaborate with industry and economic development organisations in achieving sustainable and profitable development of catchment communities;
- to maintain and improve the quality of water and condition of rivers;
- to prevent and where possible reverse land degradation (including salinity control);
- to conserve and protect the diversity and extent of natural ecosystems;
- to minimise damage to natural ecosystems and natural resource-based industries caused by plants and animals;
- to minimise damage to public and private assets from flooding and erosion.

The Authorities, in partnership with the State Government and the community, will be responsible for the development and coordination through budget processes of implementation of an approved Regional Catchment Strategy which defines the vision for the catchment with respect to the nine areas outlined above and will set targets and work programs to achieve this.

Assessment

Catchment and Land Protection Boards have played an important role in analysing threats and beneficial uses. This must continue so as to provide appropriate strategies to protect soil and water at the sub-catchment level. It remains to be seen how effective the new Catchment Management Authorities are in achieving their objectives.

3.2.7 FIRE MANAGEMENT PLANNING

Fire has long been a major influence on Victorian forests and large, intense wildfires are a recurring feature of the environment. The Department of Natural Resources and Environment has statutory duties to '*carry out proper and sufficient work for the prevention and suppression of fire in every State forest and national park, and all protected public land*' (Section 62(2), *Forests Act 1958*). Fire is also used to prepare seedbeds to ensure adequate forest regeneration, to manipulate plant and animal habitat and to reduce fuel loads as an aid to wildfire control.

Fire management on public land in Victoria is guided by the Code of Practice for Fire Management on Public Land (CNR, 1995c) ('the Fire Code'). Regional fire protection plans are also produced and these include strategies for the prevention, detection and suppression of wildfire. On private land, the Country Fire Authority (CFA) is responsible for fire prevention and fire suppression. Strategic and operational plans are developed through the CFA Planning System. At the statewide level the CFA has a 5 year corporate plan and an annual working plan approved by the CFA Board. Annual business plans are developed and implemented at the regional level by Regional Fire Prevention Committees. DISPLAN provides for interagency coordination and agreed reciprocal arrangements for major disasters.

Code of Practice for Fire Management on public land

The Fire Code was established in accordance with the *Conservation, Forests and Lands Act 1987*, using both scientific input and community consultation.

It aims to 'promote the efficient, effective, and integrated management of fire and fire related activities on public land for the purpose of protecting human life, property, assets

and environmental values from the deleterious effects of wildfire or inappropriate fire regimes'. It lays down minimum standards for fire management on public land in Victoria. Higher standards may be established to accommodate local conditions. Since late 1995, any plan, instruction, prescription or guideline developed for activities on public land in Victoria must be consistent with the Fire Code.

Under the *Conservation, Forests and Lands Act 1987,* the Secretary of the Department must monitor compliance with the Code. The Code includes performance indicators and requires a formal audit of its application at least every five years.

The Code is to be reviewed within ten years of its approval, or sooner if necessary, to take account of new research information, field experience, or changes in legislation or management policy.

Regional fire protection plans

Regional fire protection plans aim to minimise the incidence, and spread of wildfires, and the damage caused by them. They include strategies to protect identified assets (eg human settlements, property, timber resources, and environmentally sensitive areas such as rainforest). These strategies include:

- identification of the network of access tracks, fire breaks, helipads, water points and firetowers to be maintained;
- liaison, communication, training and preparedness procedures; and
- establishing a zoning system for fuel reduction burning and guidelines for keeping both fine and elevated fuel levels below specified levels.

The aim is to reduce the rate of wildfire spread and improve the prospects for controlling wildfires close to assets and in strategically located regional corridors. Each year rolling three-year fuel reduction burning plans are produced and the maps put on display in Departmental offices. Consultation with the community, local fire authorities and within the Department is undertaken during preparation of regional fire protection plans and annual burning plans.
Ecologically sustainable forest management requires that fire management be sensitive to environmental values. To this end, the fire plans:

- recognise significant natural features as 'assets' to be protected from catastrophic wildfire as far as practicable;
- include particularly sensitive areas in Priority 4 burning zones where the ecological requirements of the area are given priority;
- locate strategic fuel reduction burning corridors, key tracks and helipads so as to minimise any adverse effects on wilderness, or sensitive biological areas;
- require that an assets map be maintained so that a fire controller has ready access to the information and can minimise damage to environmentally sensitive areas during fire suppression operations; and
- require that tracks constructed for fire suppression be rehabilitated.

The content of fire management plans is coordinated with Forest Management and National Park plans and ensures that Wilderness Areas and Reference Areas are protected from undue human intervention.

Fire plans include specific targets and actions against which their implementation is

monitored (for example, the area to be maintained below certain fuel levels and the lengths of tracks to be maintained). Records on the number and size of fires provide a measure of fire suppression success.
The scientific basis of fire management is under constant review and recent research results are incorporated into fire management practices and prescriptions.

Assessment

Wildfires pose a significant threat to resources, property and forest values on both public and private lands. Potential losses are considered in planning. Clearly established planning guidelines under the Code of Practice for Management of Fire on Public Land and strategic and operational plans provide a sound basis for integrated and effective management and control of fire in Victoria. The current practice of ensuring that fauna and flora officers have input to fire management plans is an important part of minimising risks to biodiversity. On private lands, the processes and planning mechanisms adopted by the Country Fire Authority provide a logical and accountable basis for strategic and operational planning for prevention and control of wildfires. The main area for improvement is the need to strengthen the scientific basis of management plans through research in order to better balance protection of life and property with conservation of biodiversity, soil and water.

3.2.8 FLORA AND FAUNA PLANNING

Flora and Fauna Guarantee

The Victorian *Flora and Fauna Guarantee Act 1988* requires that '*...all native species and communities survive, flourish and retain their potential for evolutionary development in the wild state'*. The Act consequently has a significant influence on management of public land and, to some extent, private land.

The Act establishes a process for 'listing' species and communities threatened with extinction. Potentially threatening processes that may threaten one or more species can also be listed. Following listing, an Action Statement must be prepared detailing a program for conservation of the species or community, or control of the potentially threatening processes.

Action Statements include objectives and actions that provide a benchmark against which to assess their effectiveness. Action Statements generally apply for five years with provision for review earlier if required. The Act also provides for species management plans.

A draft Flora and Fauna Guarantee Strategy, also required under the Act, has been released for public comment (DCE, 1992b). The final strategy will set out priorities for habitat conservation and control of potentially threatening processes.

There are many opportunities for public participation in the Flora and Fauna Guarantee process. Anyone may nominate a species, community or potentially threatening processes for listing under the Act. Nominations are assessed against set criteria by a Scientific Advisory Committee which then decides whether to recommend items for listing. The Committee's deliberations are recorded and made publicly available. Items recommended for listing are advertised so that members of the community have the opportunity to comment. Comments are considered by the Committee before final recommendations are made and formal listing proceeds. In preparing Action Statements for listed items, NRE consults relevant experts in the scientific community.

Recovery plans

The Commonwealth *Endangered Species Protection Act 1992* provides for listing of species, communities and threatening processes at the national level in a similar fashion to that of the Flora and Fauna Guarantee.

The Act emphasises use of Recovery Plans to assist the recovery of endangered species and communities, and the use of Threat Abatement Plans for reducing the impact of threatening processes. The preferred approach for the preparation of recovery plans is to appoint a Recovery Team of scientific experts, management authorities and representatives from key interest groups. Recovery teams oversee research, survey, management actions, and preparation of the Recovery Plan. Recovery Plans include objectives and actions that provide a benchmark for assessment of their effectiveness. They typically apply for five years, but may be reviewed in the light of ongoing research and management.

As part of the East Gippsland Regional Forest Agreement, the Commonwealth and Victorian Governments have agreed to minimise duplication of processes, by formally adopting Flora and Fauna Guarantee Action Statements as Recovery Plans wherever possible.

Additional plans for flora and fauna conservation

NRE produces occasional management plans or strategies for particular flora or fauna values that require more detailed treatment. Examples include fire management strategies for the Coastal Heathlands of East Gippsland, a management plan for the rainforests of the Lower Snowy River and a Long-footed Potoroo management strategy.

Assessment

The Flora and Fauna Guarantee Act and Endangered Species Protection Act establish clear policy direction and a logical process for the identification of endangered species and communities, threatening processes and mechanisms to mitigate and prevent threats. They also have clear requirements for involvement of scientific experts, community consultation and consideration of socio-economic issues . However, while Action Statements have been completed for numerous species, they have not been completed for communities and threatening processes. Additionally, the overarching Flora and Fauna Guarantee Strategy has yet to be completed. These elements of the Flora and Fauna Guarantee should be implemented to ensure a coordinated approach to flora and fauna conservation.

The effectiveness of Action Statements and Recovery Plans needs to be better assessed, based on monitoring and research.

3.2.9 CULTURAL VALUES

Aboriginal places

Aboriginal places include areas of traditional and continuing significance to Aboriginal communities and sites with material evidence of Aboriginal occupation and use. Aboriginal places are potentially threatened by disturbance associated with activities such as road construction, timber harvesting, recreation activities, and development of visitor facilities. The location of known Aboriginal places is sensitive information and not all places are known (archaeological sites for example).

Aboriginal places in Victoria must be protected in accordance with the Victorian *Aboriginal and Aboriginal Relics Preservation Act 1972* and the Commonwealth *Aboriginal and Torres*

Strait Islander Act 1984. The only circumstances under which such places may be damaged or destroyed is with the express permission of the local Aboriginal communities.

Forest Management and National Park plans include mechanisms to protect known Aboriginal places and emphasise the importance of close liaison with Aboriginal Affairs Victoria and local Aboriginal groups. NRE also helps to protect Aboriginal places through maintaining their confidentiality. On private land, Aboriginal places must be considered through the planning process for Native Vegetation Retention.

Historic Places

Historic sites in Victoria are identified through studies, both systematic and otherwise, conducted, for example, as part of National Estate assessments, LCC investigations and regional thematic heritage studies. Sites of special significance to the history and development of Victoria may be listed on the Victorian Heritage Register and the Commonwealth Register of the National Estate.

Protection of historic sites in forest areas is achieved by reservation following LCC studies, or through identification of appropriate management zones in Forest Management Plans or management plans for parks and conservation reserves. Such plans usually require that expert opinion be sought before any disturbance, or site development works are undertaken at historic sites. Statutory protection of sites is also achieved through the provisions of the *Heritage Act 1995*.

NRE subscribes to Australia ICOMOS Guidelines for the Conservation of Places of Cultural Significance (the Burra Charter). The Charter sets out the procedures and standards for site-based conservation works.

Assessment

A suite of legislation protects all archaeological sites (Aboriginal and historic), significant historic sites, and aesthetic values. They are recognised both at the strategic planning level, and in a range of management plans. However, there are deficiencies at the operational planning level.

Areas for improvement include:

- a systematic approach to Aboriginal site impact assessment for ongoing identification of values (through consultation with communities and field survey);
- collaboration with Aboriginal communities to facilitate and increase their participation in natural resource management;
- improved liaison with Aboriginal Affairs Victoria in order to implement the Aboriginal and Archaeological Relics Act; and
- improved consultation with local Aboriginal communities in the preparation of WUPs and about the proposed siting of forest operations.

3.2.10 EXPLORATION AND MINING

All minerals in Victoria, as defined in the *Mineral Resources and Development Act 1990* (MRD Act), with only a few exceptions, are owned by the Crown. The Crown reserves the right to issue licences for exploration and mining of these minerals. All mineral exploration and mining activities are carried out under the provisions of the MRD Act which is administered by NRE. The Act defines the following three categories of Crown Land.

- **Exempted areas** (about 34 per cent of crown land). Predominantly includes National

Parks, State Parks and Wilderness Parks scheduled under the *National Parks Act 1975*. New exploration and mining licences cannot be granted over these areas, but pre-existing licences and leases can continue and be renewed, and pre-existing applications considered in accordance with specific requirements of the National Parks Act relating to mining.

- **Restricted Crown Land** (about 8 per cent of crown land). Includes Regional Parks, Coastal Parks, Flora and Fauna reserves, wildlife reserves, historic reserves and various other reserves. Licences can be granted over this land, but access for exploration and mining requires the consent of the Minister for Conservation and Land Management.
- **Unrestricted Crown Land** (all remaining crown land, including State forest). The Minister for Agriculture and Natural Resources must consult with the Minister for Conservation and Land Management about mining or exploration proposals, but the latter Minister's consent is not required.

Approval of exploration and mining under the MRD Act is a two stage process. The first stage involves the granting of an exploration or mining licence by NRE which confers exclusive exploration or mineral rights from the Crown to the licence holder, but does not itself allow works to be undertaken. To ensure that potentially affected parties are aware of the proposal, applicants are required to advertise the licence application in the Melbourne press and a newspaper circulating in the locality where the licence is sought. Any objections received are considered by the Minister before deciding whether to grant the licence.

The second stage of the approval process includes obtaining all other relevant consents and permits, obtaining an approved work plan (including a rehabilitation plan for mining projects), settling any compensation requirements, and lodging a rehabilitation bond.

For exploration, planning approval is not required and work may commence when the requirements of the MRD Act are satisfied. However, exploration is subject to comprehensive licence conditions which include requirements for environmental care and rehabilitation.

NRE cannot issue an Authority to Commence Work for mining until either a planning permit has been granted or an EES prepared.

For each mining proposal on private or public land (excepting exempt areas) the Minister for Planning and Local Government may be asked to determine whether an Environment Effects Statement should be prepared under the provisions of the *Environment Effects Act 1978*. Planning permits under the *Planning and Environment Act 1987* are not required for mining if an EES is prepared.

As part of the RFA process a National Reserve System is being established. It comprises dedicated conservation reserves and Special Protection Zones in State forest. While those parts of the system in State forest will remain as unrestricted Crown Land, in the East Gippsland RFA Victoria has agreed that all proposed mining activities in forest reserves will be the subject of an individual EES, and proposed exploration activities involving road construction or bulk sampling will be subject to an exploration impact statement (under the MRD Act).

Environmental Effects Statements

Once a decision has been made to prepare an EES, the process is as follows.

- Appointment of consultative committee. The Minister for Planning and Local Government appoints the committee comprising representatives of government agencies

and the community. The committee's terms of reference typically require them to advise and assist the mining company on the scope and content of the EES, examine refinements or alternatives to the proposal, ensure adequate consultation, and provide advice to the Minister.

- EES Exhibition. The EES is prepared by the proponent and exhibited for at least four weeks
- Inquiry Hearing. If the Minister considers that the proposal is complex or controversial, then he/she may appoint one or more persons to hold an inquiry into its environmental effects. In practice, it can be expected that all mining projects will require an inquiry. Typically those conducting the inquiry would be required to consider the EES on the mining proposal, examine feasible alternatives, hold public hearings, and provide advice to the Minister on whether the proposal should be approved and, if so, what conditions should apply.
- Minister's Assessment Report. The Minister for Planning and Local Government submits an assessment report to the Minister for Agriculture and Natural Resources and other relevant decision makers (eg Minister for Conservation and Land Management or the Environment Protection Authority). At the same time, the report of any inquiry process is made public.
- Environment Protection Authority works approval. Where the mining proposal involves the off-site discharge of waste water or the proposed activities make them scheduled premises for air emission control, an EPA works approval is required. In such situations the works approval and EES process can occur concurrently.
- Minister for Conservation and Land Management approval. Required for restricted Crown Land only.
- Authority to Commence Works. NRE issue this Authority subject to MRD Act requirements.
- Commencement of works.

Planning Permits

Where an EES is not prepared, a planning permit under the *Planning and Environment Act 1987* will be required. The MRD Act prevents mining from being a prohibited land use under any planning scheme. However an application planning permit for mining would still be subject to normal scrutiny by public land agencies such as NRE (a mandatory referral authority for all mining applications), Environmental Protection Authority and local water authorities. Any affected parties may lodge objections to the permit being issued. The responsible authority, usually local government, decides whether or not to issue a planning permit, unless the Minister for Planning and Local Government decides to call in the application and make the decision personally. As with other planning decisions, dissatisfied parties have recourse to the Administrative Appeals Tribunal. Once a planning permit has been issued, the proponent must still have a valid mining licence and an Authority to Commence work as set out in the MRD Act and described above.

Work Plans

The MRD Act requires that a licensee proposing to do work under a Mining Licence or an Exploration Licence submit a Work Plan to NRE for approval. In the case of a Mining Licence, the Work Plan must include a Rehabilitation Plan. The Rehabilitation Plan is required to specify the desired condition of the land following rehabilitation and to set out in detail the sequence and timing of works for progressive rehabilitation of the affected land. Rehabilitation plans typically cover landscaping and screening, soil removal, stockpiling and

re-spreading, revegetation, control of soil compaction, runoff and erosion, removal of waste, site safety, and the maintenance and monitoring of rehabilitated sites. NRE has a booklet, "Preparation of Rehabilitation Plans and other Environmental aspects of Work Plans". Mines inspectors, environmental officers and local land managers monitor and enforce compliance with the Work Plan.

Environmental Review Committees (ERCs)

For substantial mining projects, NRE establishes ERCs to monitor environmental performance, review future mining plans and deal with complaints and community concerns. ERCs are usually chaired by the Regional Mining Engineer and include representatives of relevant government agencies and the local community.

Assessment

The environmental effects statements (EES) and planning processes for assessing exploration and mining applications provide opportunities for consideration of socio-economic, environmental and cultural values and for public participation. Work Plans provide mechanisms for the setting of licence conditions. The on-ground presence of NRE staff is designed to ensure that monitoring of compliance with licence conditions occurs and that progressive rehabilitation of mine sites is satisfactory. Rehabilitation bonds provide a further incentive for compliance.

The incorporation of the former Department of Minerals and Energy into NRE should facilitate communication between of the formerly separate agencies and help produce more timely and balanced outcomes. NRE is however still refining its internal processes for assessment of exploration and mining applications.

The local government planning process for assessment of mining applications is slow and often more adversarial than the EES process. The EES process is more objective and rigorous, providing better opportunities for consideration of scientific evidence and differing views on the relative merits of a proposal.

3.2.11 OTHER PLANS

Forest management issues not catered for by specific processes described above (such as recreation, landscape and pest control) are addressed in management plans for State forest, national parks or other reserves. Occasionally, additional plans and strategies are prepared to covering particular issues and localities. Examples include:

- a three-year Four-Wheel Drive Road and Track Improvement Plan. The plan is routinely reviewed by an advisory panel made up of Departmental and Four-Wheel Drive club representatives;
- action plans for specific pests, such as, the monitoring of psyllid infestations in Mountain Ash forests of the Central Highlands; and
- regional tourism strategies.

Effective operational planning depends on, for example, identification of critical values at the local (coupe scale) (e.g. soil erodibility, habitat requirements in Special Management Zones). On-ground assessments are made by Foresters and Rangers and their professional judgement is critical. Current planning processes need to better emphasise the importance of adequate technical training of field staff and access to support materials.

Assessment

While most issues are appropriately dealt with through strategic plans and additional plans as described above, the overall effectiveness of pest management is limited by the lack of strategic plans for pest plant and animal control that cover all tenures. Operational planning processes should provide continuing programs for training and updating field staff and access to support materials.

3.3 IMPLEMENTATION

For effective implementation of ESFM, an organisation needs to develop the capabilities and support mechanisms necessary to achieve its policies, objectives and targets. In Victoria the mechanisms are:

- accountability and responsibility,
- programs and budgets,
- operational controls,
- documentation, records keeping and reporting,
- communication and education, and
- knowledge, skills and training.

Each of these elements is considered below.

3.3.1 ACCOUNTABILITIES AND RESPONSIBILITIES

Of Victoria's total forest estate (native forests and plantations), 4.4 million hectares (84 per cent) is native forest managed by the Department of Natural Resources and Environment and Parks Victoria, 605 000 hectares (12 per cent) is native forest on private land, and 250 000 hectares (4 per cent) is plantations under various tenures.

While NRE and Parks Victoria have primary responsibility for most of Victoria's forests, numerous other agencies also have specific areas of responsibility (Table 3.1). Management of private land is the responsibility of individual landholders although other agencies have a role in educative and cooperative programs, and in implementation of planning controls.

Table 3.1 Responsibility for Implementation

System Components	Lead Agency
1. Legislation and Policies	
Commonwealth legislation and policies	Commonwealth Agencies
Victorian Government legislation and policies	State Agencies
National Policies	Joint Agency Committees
2. Planning	
Strategic Planning	
Regional Forest Agreements	Commonwealth and State governments
Land Use Planning - Public land	Land Conservation Council
Forest management planning - public land	
Forest Management Plans (State forest)	NRE: Forest Service
Victorian Code of Forest Practices	NRE: Forest Service
Regional prescriptions	NRE: Forest Service
Sustainable Yield	NRE: Forest Service
Wood Utilisation plans	NRE: Forest Service
Forest coupe plans	NRE: Forest Service
Log grading	NRE: Forest Service
Park planning	
Park Plans	Parks Victoria
Private land	
Land Use Plans	Local government
Education and cooperative programs	Landcare and Farmtree groups; NRE; Victorian Trust for Nature; Catchment Management Authorities
Native Vegetation Retention Controls	Local government
Code of Forest Practices for Private Land	Local government
Waters of Victoria State Environment Protection Policy	Environment Protection Authority
Flora and Fauna Guarantee	NRE: Parks, Flora and Fauna
Plantation Management	Victorian Plantations Corporation; Australian Paper; Australian Newsprint Mills, various smaller growers
Private forestry strategy	NRE
Fire management planning	
Code of Practice for Fire Management	NRE: Forest Service
Regional Fire Protection Plans	NRE: Forest Service
Flora and Fauna planning	
Flora and Fauna Guarantee	NRE: Parks, Flora and Fauna
Recovery Plans	DEST; Environment Australia
Cultural values	
Aboriginal places	Local Aboriginal communities; Aboriginal Affairs Victoria
Historic places	NRE: Heritage Victoria
Exploration and Mining	
Environmental Effects Statements	Department of Infrastructure
Planning Permits	Local government
Work Plans	NRE: Minerals and Petroleum
Environmental Review Committees	NRE: Minerals and Petroleum
Other Plans	NRE

Table 3.1 Responsibility for Implementation (continued)

System Components	Lead Agency
3. Implementation	
Programs and Budgets	NRE
Operational Controls	
Timber harvesting in State forests	NRE: Forest Service
Operations in National Parks	Parks Victoria
Private land	Private landholders; Local government.
Control of fire management	NRE: Forest Service; Country Fire Authority
Documentation and records keeping	All relevant agencies
Communication and Education	All relevant agencies
Knowledge, skills and training	NRE: Parks Victoria
4. Information, Monitoring and Evaluation	
Forest information	NRE: Parks Victoria; Australian Heritage Commission; Aboriginal Affairs Victoria; Heritage Victoria
Monitoring implementation of plans and progams	NRE: Parks Victoria; Local government
Monitoring and evaluating condition of the forest environment	NRE: Environmental Protection Authority
Auditing of compliance with regulations and controls	NRE: Local government
Corrective action	NRE: Local government
5. Review and Improvement	
Review of the Environmental Management System	Commonwealth and Victorian Governments
Research and Development	Victorian Government agencies

Assessment

The accountabilities and responsibilities for delivery of each element of ecologically sustainable forest management are clearly established.

The high level of public ownership and land management by one Department (NRE) provides a sound basis for a coordinated approach to ecologically sustainable forest management and minimises overlap and duplication between government agencies. Service delivery is facilitated by a departmental structure which has both centralised control and strong decentralised components.

The creation of Parks Victoria as a provider of park management services to NRE is new. It is unclear whether policy and regulatory functions can be clearly and effectively separated and maintained by the Parks Program within NRE, and whether the protocols and other planning measures concerning coordination across these and other bodies within NRE and Parks Victoria will be effective in fire and other management activities. These aspects merit review and continued improvement.

3.3.2 PROGRAMS AND BUDGETS

The following steps occur in the development of NRE programs and budgets.

- Treasury allocates funds to NRE in line with the Government's major program priorities.
- Executive Directors provide program development guidelines and preliminary allocations to each of the relevant major business units across the State (including Parks Victoria).
- Each of the major business units (Branch/Region) provides guidelines and preliminary allocations to its local business units, and negotiates service delivery contracts with service providers, eg research institutes.
- Each local business unit develops a proposed program and budget based on on-ground delivery requirements from strategic and operation plans (eg for timber production, the regeneration requirements flowing from Wood Utilisation Plans) within the overall business priorities and preliminary allocation indicated by the Director. Bids are also developed to meet any local shortfall in strategic and operational plan requirements, as well as for local or State-wide initiatives.
- Each major business unit (Branch/Region) prepares a proposed Service Agreement consisting of local proposals for the Director. In the case of Parks Victoria, a corporate plan and business plan are developed for approval by NRE.
- Each major business unit then finalises its Service Agreement and adjusts staffing and infrastructure accordingly.
- The achievement of Service Agreement targets is monitored throughout the year and a final report is prepared.

Financial reporting includes:

- Charts of Accounts which identify programs, business centres, fund sources, accounts, and projects, and provide the basis of financial reporting.
- Financial Statements prepared in accordance with the relevant Financial Management Act for each major business and program These are summarised in Annual Reports and presented to Parliament.
- Annual Financial Statements for commercial native forest operations. These are prepared in accordance with Government policy and are made available for public scrutiny.

Assessment

The program and budgeting process of NRE reflects National Forest Policy Statement initiatives to improve public forestry accounting systems. In this way, the performance of both commercial activities and community service obligations can be clearly evaluated.

A strength of the business unit structure is that it should allow all costs and benefits related to ecologically sustainable forest management to be fully identified. To this end, full accrual accounting is being adopted by NRE businesses. Uniform treatment of all business units and activities is difficult and ongoing refinements are needed. Particular attention is needed to identify costs on a regional basis and to separate costs of commercial and non-commercial activities. The level of funding to an individual region should be linked to the requirements for effectively implementing the strategic and annual plans for that region. Maintenance of a

strategic focus for research into ecologically sustainable forest management also needs a continuing commitment to funding.

3.3.3 OPERATIONAL CONTROLS

As major forest managers, NRE has many mechanisms with which to control operations on private land. Local Government has a regulatory role for forest management, while NRE has an advisory role.

NRE achieves compliance with plans and other formal obligations through direct supervision of operations, line management and other reporting functions. Service Agreements are the basis for internal control of operations. Checking against annual operational targets (eg for fuel reduction burning, pest plant and animal control) is part of assessing the achievement of annual Service Agreements.

Control of timber harvesting in State forest

Mechanisms for controlling timber harvesting on public land are complex. This is because of the potential environmental risks, and because the operations are normally carried out by private logging contractors employed by a third party.

Timber harvesting in State forest must be in accordance with a Forest Coupe Plan. These are prepared by NRE field officers and are consistent with the higher level forest management and wood utilisation plans and the Code of Forest Practices for Timber Production and regional prescriptions. Once a coupe plan is approved, an NRE officer is assigned responsibility for its implementation. The task involves marking out the coupe on the ground, liaising with logging contractors, supervision of operations, collection of seed required from the coupe, and specifying any corrective action needed to ensure that the specifications of the job or contract are met.

Logging operations are usually carried out by contractors employed by the log licensee (usually a sawmiller or consortium of sawmillers). All contractors and their employees involved in logging operations on public land must have completed environmental and safety training courses, have appropriate work skill accreditation, and be licensed forest operators. A logging team leader is responsible for the actions of the logging team. Both the NRE officer supervising the operations and the logging team leader are required to sign-off the Forest Coupe Plan before operations are commenced.

Breaches detected through routine operational monitoring are punishable under the Timber Harvesting Regulations with “indicator points.” The accrual of indicator points can lead to licence suspension or cancellation. Statistics such as numbers of licensed operators by regions, breaches and suspensions etc are available for public scrutiny.

Once harvesting operations and rehabilitation of the coupe (eg breaching of tracks, ripping of landings) are completed, the supervising forest officer and Logging Team Leader for the Forest Coupe Plan must sign a Coupe Completion Certificate. Records are kept in a coupe diary throughout the operation and placed in the local Departmental records system.
The sale of timber normally involves the measurement, grading and numbering of each sawlog. Log dockets identify the Forest Coupe Number, the number of each log in the load, and the species, log grade and measurements for each log. Accounts are prepared for each log licence on a monthly cycle indicating the volume supplied and the royalty and other payment due. These data are held in the Department’s LOGSALES system. Royalties, licence fees and charges are collected and recorded in the Department’s financial

management system.

Control of fire management operations

On public lands, Fire Protection Plans (FPPs) are implemented through annual plans comprising a schedule of prevention and preparedness works for the next 12 months, and a forward program of schedules and maps for fuel reduction burning and preparedness works for the next three years. During the burning season, the daily update of the FIRES database (which contains details of the Burn Plans for each prescribed burn) provides the status of each burn and weather and management information. Hardcopy reports record relevant information before and during burns and an assessment of the degree of success in achieving Burn Plan objectives. There is an opportunity for specialist peer review, usually through on-ground or aerial inspection of the burnt area, including documentation of findings. These reports are attached as permanent records to the approved Burn Plans. The Fire Code is more recent than many FPPs (approximately half of Victoria's FPPs are due for 5-yearly review). Completion of these reviews will ensure FPPs comply more closely with the Fire Code.

On private lands, Regional Fire Prevention Committees are responsible for implementing fire prevention plans. Country Fire Authority field staff supervise and inspect prescribed burning operations. It is a requirement that the officer in charge of prescribed burning operations brief all personnel involved. In wildfire suppression operations, a hierarchy is established to ensure that highly trained individuals are responsible for the supervision of work crews.

Control of other activities in State forest

NRE regulates other uses of the forest, for example, recreational fishing, through the issuing of licences. Licences are also issued for the sale of minor forest products including honey, firewood, wildflowers and seed.

Control of operations in national parks

The park management plan sets the strategic directions for the park. The strategies in the plan form the basis for programs which are implemented at the park level under the general direction of the relevant Chief Ranger and Ranger in Charge. Statewide guidelines and procedures for parks and reserves provide guidance and a consistent approach across the State for a variety of field operational matters and park management issues.

Work by contractors in parks is carried out under the general supervision of field staff. Ranger patrols assist in ensuring visitor compliance with regulations and resource protection legislation.

Leases and licences issued under the National Parks Act are managed by the Chief Ranger and associated field staff. Leases and licences include conditions aiming to protect park values which must be adhered to. The management of commercial tour operations in parks includes a demerit point system which assists in monitoring of performance by operators.

In December 1996, the Victorian Government announced the creation of Parks Victoria, a new organisation to manage Victoria's national, State, wilderness other parks and open space. The creation of this organisation to manage day-to-day operational issues is designed to ensure a coordinated and well-resourced approach to park management across the State.

All policy issues relating to park management will remain with the Department of Natural

Resources and Environment under the Director of the Parks Program. Parks Victoria will be directly accountable to the Minister for Conservation and Land Management

Control of other operations on public land

Other operations on forested public land, such as those associated with fire protection or pest plant and animal control, are delivered through regionally based administrative structures. Work plans are drawn up in accordance with relevant strategic plans, policies and guidelines and implemented by works crews supervised by NRE or Parks Victoria.

Control of activities on private land

Private landholders are responsible for controlling activities on their land. For timber harvesting operations, a Timber Harvesting Plan conforming to the Code and the S13 amendment to the planning scheme must be lodged with the responsible authority. This is usually local government which is then responsible for ensuring compliance with the provisions of the plan. These can be enforced through formal enforcement orders and subsequent recourse to the Administrative Appeals Tribunal.

Permits for clearing of native vegetation or harvesting of certain species are also required in some circumstances.

Mining activities on private land must conform with the conditions of mining licence conditions.

Assessment

Control of timber harvesting in State forest

The process for control of forest operations to achieve compliance with the Code of Forest Practices and Coupe Plans is transparent and accountable. There is clear responsibility for control for each stage of timber harvesting from supervision of the implementation of the Coupe Plan to the signing of a Coupe Completion certificate following satisfactory compliance with the plan, including draining of major snig tracks and rehabilitation of landings. The Forest Operator Licensing System is a major strength in managing timber harvesting operations.

The indicator point system provides a strong basis for the regulation of harvesting activities conducted by independent contractors to ensure they conform with the Code of Forest Practices.

An area for improvement is the supervision of forest operations where protection of archaeological or heritage values is important.

Control of fire management operations

The process of control to achieve compliance with the Code of Fire Management on Public Lands is transparent and accountable. Country Fire Authority requirements for supervision by trained staff of all fire prevention and control operations, and a permit system for prescribed burning by private landholders provides an accountable basis for control of fire operations on private land. Improvement is needed in the forthcoming reviews of Fire Protection Plans to ensure that specialist peer review is generally undertaken.

Control of operations in National Parks

National Parks are not covered by a Code of Practice, but procedures and guidelines are in place to cover a number of activities. Statewide guidelines and procedures for parks and

reserves provide guidance and a consistent approach across the State for a variety of field operational matters and park management issues. Supervision of contractors by field staff, ranger patrols to ensure visitor compliance with regulations, and leases and licences provide further operational control.

Control of other operations on public land
The lack of auditing processes for other Departmental operations is a weakness which should be addressed. In particular, there is a need to audit the extent of compliance of strategic and operational plans.

Control of activities on private land
See assessment for Section 2.4

3.3.4 DOCUMENTATION, RECORDS KEEPING AND REPORTING

All agencies with responsibilities for ecologically sustainable forest management publish the outcomes of legislative and strategic planning processes, or maintain information in databases which are available to the public. The results of completed inventory and research programs are documented in published reports and maps. Outcomes of agency corporate planning and business planning processes are documented and made available internally; the former are also made available to the public. Agency performance is documented in published annual reports.
Operational policies, guidelines and prescriptions (eg Procedures Manuals and NRE silvicultural guidelines) are published and distributed internally and are available to the public on a limited basis (because of size, expense in printing and frequency of updates).

Agency operational plans and records are documented in file systems and operational management information systems. Records on harvesting operations, rehabilitation of the coupe (eg breaching of tracks, ripping of landings) are kept in a coupe diary throughout operations, then placed in local departmental records systems.

Records of areas harvested, regenerated or burned by wildfire or management burns are not currently digitised and held in the Geographic Information System. Hence, they are not readily available for updating the Forest Disturbance History, Old Growth Forest and other datasets influenced by disturbance. NRE is investigating videography and other techniques to improve its systems.

Assessment

Most documents comprising the environmental management system are published or publicly available. However, greater attention should be paid to ensuring that up-to-date copies of key documents, for example, management prescriptions, are readily available to staff and other relevant parties.

There is a need for a computerised database system to record forest operations in particular, timber harvesting. This is important to ensure that old-growth forest and forest resource inventory information is regularly updated.

Archival material of particular interest to ecologically sustainable forest management (including historical records of fire, storm, settlement, timber harvesting) is not properly catalogued and stored.

3.3.5 KNOWLEDGE, SKILLS AND TRAINING

Agencies involved with ecologically sustainable forest management depend on a wide range of skills, particularly specialist scientific skills and on-ground technical skills.

NRE and Parks Victoria employ staff with a wide range of specialist scientific and natural resource management skills (eg flora and fauna, forestry, pest plant and animal control). They also engage private sector contractors with similar or supplementary skills. Whilst most professional staff have tertiary qualifications, technical staff are normally trained internally or by Technical and Further Education Institutes to meet the agencies' skill requirements. The Forests Service has a full-time training officer to coordinate training according to training strategies developed by the respective businesses. There are also formal links between NRE and the Forest Industry Training Board.

A training program for industry personnel which covers environmental aspects of the Code of Forest Practices for Timber Production, regional prescriptions and timber harvesting regulations (CNR, 1992) is provided by training agencies. The aim of the training is to foster a general appreciation of environmental values and the need for prescriptions to protect them.

To obtain a licence, forest operators must:

- successfully complete the environmental training course;
- provide proof of accreditation in particular work skills; and
- complete an Occupational Health and Safety Course specifically developed for forest operators.

Assessment

While NRE and Parks Victoria have training programs, there is room for improvement in the following areas:

- ensuring that levels of skilled staff for fire-planning and suppression activities are maintained at least at current levels;
- improved training of staff who have to deal with, and make judgements on, cultural and heritage values on public and private land;
- long-term training strategies for individual staff members, including recognition of accumulated skills and experience such as field staff's knowledge of local forest, soil and other characteristics;
- retention and transmittal of corporate knowledge through documentation of procedures - this is particularly important in the face of ongoing rationalising of government departments and reduction in staff numbers; and
- effective induction and regular training of staff.

3.3.6 COMMUNICATION AND EDUCATION

Effective communication within and between Government agencies and industry and community groups with an interest in forest management is an essential component of ESFM.

Intergovernmental arrangements for implementation of national policies and international

treaty requirements relating to ecologically sustainable forest management include: Australian and New Zealand Environment and Conservation Council (ANZECC); Standing Committee on Forestry under the Ministerial Council for Forests, Fisheries and Aquaculture (MCFFA); and JANIS (Joint Australian and New Zealand Environment Conservation Council (ANZECC) Ministerial Council for Forestry, Fisheries and Aquaculture (MCFFA) National Forest Policy Implementation Statement (NFPS) Subcommittee).

Internal communication mechanisms, such as newsletters, web sites and computer networks provide access to financial, human resource and forest inventory data, and Geographic Information Systems.

There are many opportunities for interested parties to become involved in forest planning processes, including LCC studies, forest management and park plans, wood utilisation plans, burning plans and others. These are described in the relevant sections of the report. There are also opportunities for on-going consultation with stakeholders through meetings with peak groups (eg Four-Wheel Drive Advisory Committee, National Parks Friends groups and Advisory Committees.)

NRE and Parks Victoria have a range of facilities providing information and education on various aspects of forest management. These include:

- educational and cooperative programs for private landholders (see Section 3.2.4);
- maintaining a permanent presence of extension and landcare officers in the field, and providing field days and private forestry demonstrations;
- NRE's Community Awareness Strategy (CNR, 1995d) and a Forest Education Program provided by the Toolangi Forest Discovery Centre;
- an education strategy, interpretation facilities (including major visitor centres), and programs operated by or under the auspices of Parks Victoria;
- an NRE shopfront at the Melbourne Head Office and smaller facilities at regional offices;
- NRE-maintained home pages on the World Wide Web.

Assessment

The NRE and Parks Victoria internal referral processes for operational and strategic planning are an important mechanism for resolving multi-disciplinary issues and ensuring that strategic and operational plans are complementary and consistent.

The department’s educational and cooperative programs for private land development are important for achieving ecologically sustainable forest management. Development of further practical guides, and other information material describing good forest practice, especially to assist small plantation owners, would be helpful.

3.4 INFORMATION, MONITORING AND EVALUATION

Measuring, monitoring and evaluating environmental performance are key activities for ensuring ecologically sustainable forest management. Where objectives and targets are not being achieved, then corrective and preventative action is required to investigate and handle any non-conformance and to mitigate impacts. The system to achieve this in Victoria involves:

- collecting, analysing and storing forest information;
- monitoring plans and programs;
- auditing of compliance (e.g. compliance with Code of Forest Practices for Timber Production);
- monitoring the condition of the forest environment using indicators that reflect the nature and scale of operations and management responsibilities (eg EVCs and old growth mapping - regional scale, forest regeneration - local scale);
- reporting and communicating (external and internal); and
- taking corrective and preventative action; e.g. adjustments to codes resulting from audits.

3.4.1 FOREST INFORMATION

Up to date information on the natural, cultural and resource values of the forest estate is vital for strategic planning; it also provides a 'snapshot' of the condition of the forest at a point in time. Systematic gathering and storage of these data is essential to provide reference points against which to measure changes to the forest, evaluate the effectiveness of management strategies, and enable continuous improvement.

NRE and Parks Victoria have extensive natural, cultural and resource information covering public and private land, built up from systematic surveys and opportunistic records gathered over the past 25 years. This information is listed in the Directory of Data (Honeyman, 1996-5). The Department of Infrastructure and Aboriginal Affairs Victoria also have extensive data on historical and archaeological values. Major data gathering programs, databases and information systems of relevance to ecologically sustainable forest management are described below:

Statewide Forest Resource Inventory (SFRI)

Victoria is currently part way through this major program which includes the following components:

- Forest stand class mapping (1:25 000);
- Establishment of temporary and permanent forest inventory plots;
- Formulation of growth and yield models;
- Ecological Vegetation Class (EVC) mapping (1:100 000);
- Forest Disturbance History mapping (1:100 000);
- Forest Growth Stage mapping (1:100 000);
- derivation of an Old Growth Forest layer (1:100 000).

The program is unique in the integration of environmental and forest resource datasets. The new databases will be digital, with spatial data held in NRE's Geographical Information System (GIS). The timber resource component is a stand-based inventory using digital analysis of remote sensing imagery and two or three-stage sampling schemes. Stand-based growth and yield models derived from temporary and permanent growth plots are being developed.

EVCs represent the highest level in the hierarchy of the vegetation typology developed for Victoria. Each class consists of one or more floristic communities which exist under a common regime of ecological processes within a particular environment at a regional or local scale.

Old Growth Forest mapping is derived from forest growth stage, disturbance history, floristic vegetation, structural vegetation and historic and documentary records. The methodology, developed in East Gippsland (Woodgate *et al.* 1994), and reviewed by a Joint Scientific Advisory Group (VicRFASC, 1996b), has been refined and is now being applied to other forested regions. Old growth studies have been completed for Central Highlands and are well advanced for the North-east and the Box-Ironbark forests of Central Victoria. The program will be complete in 2001.

Hardwood Resources Information System (HARIS)

HARIS is the repository for data derived from a large number of forest inventories across Victoria since the 1960s. It includes information about the inventory type, standards and data reliability. It provides information on quantity, quality and availability of sawlogs and residual roundwood for geographic units as small as a compartment, and for individual stands within compartments. Associated with the system are maps, at a scale of 1:25 000 or similar scale and individual inventory reports. HARIS and the associated maps are updated periodically to take account of logging, fire history and information from new assessments.

HARIS data are used to forecast sustainable yield but will ultimately be replaced by the data from the SFRI. SFRI data have the advantage of being spatially identified and derived from standard inventory procedures.

Land Information Management System (LIMS)

LIMS is a textual and spatial information system which stores information on all parcels of Crown land including cadastral information, reservation status and authorised uses (for example, grazing, beekeeping sites, commercial tours)

Flora Information System (FIS)

The FIS stores and processes floristic data (species location, abundance and significance) from a range of site-based and grid-based survey sources across Victoria. Any bias or major gaps in the database are being systematically assessed as part of the CRA for each RFA region and will help to establish priorities for future survey work.

The Atlas of Victorian Wildlife

The Wildlife Atlas is a database containing species and locality data for mammals, birds, reptiles and amphibians as well as threatened freshwater fish and a small number of threatened invertebrates. It covers the whole of Victoria and includes data from systematic surveys, pre-logging flora and fauna surveys; incidental records from rangers and other field staff; museum records; and, records from field naturalist clubs and interested individuals. As for the FIS, any bias or major gaps in the database are being systematically assessed as part of the CRA for each RFA region to help establish priorities for future survey.

National Estate Values

NRE and the Australian Heritage Commission have assessed National Estate values in East Gippsland (VicRFASC, 1996c, d) and Central Highlands (VicRFASC, 1997b). The assessments were based on the Commission's assessment criteria, NRE's extensive biophysical and other databases, and the collection of additional cultural heritage information and wilderness data. The assessments generated many new spatial datasets which are held in the GIS. It is expected that much of the rest of Victoria will be assessed for National Estate values as part of the development of RFAs.

Other data

Other data of relevance to forest management include the following.

- NRE's GIS which includes a wide range of biophysical and other data such as topography, hydrology, roads, land tenure, management zones, land systems, forest cover, old-growth forest, and EVCs.
- NRE also maintains GEDIS, a geological, exploration and development information system. GEDIS is both a textual database and a GIS which covers references, mining titles, surveys, boreholes and geological sites.
- Aboriginal Affairs Victoria maintains databases on Aboriginal Sites and Aboriginal Historic Places.
- Heritage Victoria (Department of Infrastructure) maintains the Heritage Inventory which is a listing of all known historical and archaeological sites in Victoria. It also maintains the Victorian Heritage Register which is confined to sites of State significance. In addition NRE's Historic Places Section maintains a database of non-Aboriginal historic places on Victorian land. The database holds information about approximately 5000 sites.
- Visitor use data. A system for researching and monitoring visitor profiles and activity in national and other parks has recently been implemented. It includes market research and monitoring of some 85 per cent of all visits, in order to measure visitor numbers and construct movement models for zones and sites, and to monitor customer satisfaction. The system is likely to be extended to State forest in the near future.

Analytical tools

Advanced data management and powerful analytical tools are required to make full use of the increasing amount of data becoming available on forests. The following tools are used extensively by NRE.

- **Database query tools** - standard tools for retrieving and analysing textual databases such as HARIS, FIS and the Wildlife Atlas.
- **Geographic Information Systems (GIS) -** used extensively in the preparation of Forest Management Plans, for example to produce maps of particular environmental values (like old-growth forest) and analyse the relative merits of alternative zoning actions.
- **Integrated Forest Planning System (IFPS)** - The IFPS comprises several modules including the GIS, the commercial linear programming package LINDO, and the United States Department of Agriculture Forest Service's FORPLAN, encased in a shell written in SIR/DBMS language. The system was presented to a recent European Forest Institute conference and is recognised as consistent with world's best practice. It is currently used to forecast yields of timber (both textually and spatially) and has the capability to forecast yield of other products and values over time, for example, water and, in conjunction with remote sensing, to monitor forest changes over time.

- **Sustainable Yield Spreadsheet System (SYSS)** - SYSS is a spreadsheet based forest model that is complementary to the IFPS and used to forecast sustainable yields of timber under different management regimes. It uses aggregated forest stand data and stand growth models and, although non-spatial in nature, can be run under different rotation ages and silvicultural regimes.
- **Remote sensing tools** - Aerial photography has been a valuable tool for interpreting and mapping forest values and resources since its development in the 1940s. It is still an essential tool in the Statewide Forest Resource Inventory, and Old Growth and Ecological Vegetation Class mapping programs. It is also used to map fire and logging history to maintain the currency of databases. Satellite imagery and videography are being tested to map fire and logging history, and to validate data gathered by other means. Satellite imagery and videography, in conjunction with GIS, have significant potential to monitor the implementation of forest management, wood utilisation and coupe plans.

Assessment

The integrated nature of NRE has allowed the development of flora and fauna databases covering all land tenures, and the development of data-gathering programs directly linked to strategic planning requirements. However, there is room for improvement in these areas:

- gathering and storage of socio-economic data for consideration in strategic plans;
- development of a State-wide computerised site, site management and visitor statistics database in national parks and state forests to improve the management process;
- systematic surveys of plant pest location and density and the development of a specific strategic plant and animal pest protection plan (similar to the fire protection plan) identifying priority control zones;
- regular updating of data concerned with Aboriginal sites and National Estate values;
- making the GIS available to staff in the more remote areas of the State as well as in Melbourne and major regional centres;
- implementation of the Statewide Forest Resource Inventory throughout Victoria to obtain more precise measures of standing volumes, changes in the area available for harvest, and forest growth on representative sites; and
- implementation of the Integrated Forest Planning System as new data from SFRI becomes available electronically.

3.4.2 MONITORING THE IMPLEMENTATION OF PLANS AND PROGRAMS

Management plans for both forests and parks include specific actions required to meet objectives. Each year, senior foresters for each Forest Management Area are required to monitor the implementation of plans and programs against a checklist of actions and report on their progress. These reports are to be evaluated and any deficiencies in implementation addressed. A system for monitoring both implementation of park plans and their effectiveness in achieving environmental objectives is being developed.

Fire plans include specific performance indicators as defined in the Code of Practice for Fire Management against which their performance is assessed. The FIRES database contains details of target burn areas and actual area burnt for each burn. Annual Fire Protection Plan reports compare these statistics for priority burn areas. Corrective action can include

adjustments to annual works programs or to local or regional prescriptions to take account of area burnt targets and other issues relating to the achievement of Burn Plan objectives. Annual Service Agreements cover the achievement of fire related targets set out in service agreements.

Assessment

While recent strategic plans include mechanisms to monitor their implementation, this is a relatively new process and implementation reports are yet to become available. It is essential that NRE complete the system for monitoring implementation of park plans, commence reporting on plan implementation on all land tenures, and make the information publicly available, along with actions intended to address any identified deficiencies.

The monitoring of implementation of Wood Utilisation Plans is hampered by the lack of an adequate coupe recording and tracking system.

3.4.3 MONITORING AND EVALUATING CONDITION OF THE FOREST ENVIRONMENT

Sustainability Indicators

Formal monitoring against specific standards is a relatively new area of forest management. Victoria, along with other State agencies, is part of the Montreal Implementation Group Process which is working to develop a set of sustainability indicators applicable at the regional level. An agreed set of indicators may be available by late 1997.

Ecological management system for protected areas

Parks Victoria is currently developing a strategic and performance-accountable system for the ecological management of Victoria's protected areas. The purpose of the system is to provide a framework for decision-making on ecological management priorities, and to provide mechanisms for monitoring reporting on both management performance and trends in ecosystem health. The system is to be developed over the next two years.

Current monitoring programs

The ongoing ecological surveys, forest mapping and resource inventory programs provide information about the forest environment and how it has changed through time.

A significant amount of informal monitoring of the condition of the forest environment is also carried out on a regional basis by Forest Officers, Park Rangers, Flora and Fauna Officers and Catchment Management Officers. NRE and Parks Victoria rely on their frequent presence and familiarity with the forest environment to identify problems such as road maintenance, illegal activities, loss of habitat trees, status of threatened species populations and disease.

Field staff also make observations from the air during fire detection and suppression operations and aerial photography operations (to map forest coupes following harvesting). This also provides the opportunity to detect potential disease, storm damage and other problems.

Specific monitoring programs currently in place include the following.

- Sawlog growth and standing sawlog volume and residual log volume are measured through the Continuous Forest Inventory Plots. Timber volumes harvested from routine coupes are recorded and compared with forest growth and yield estimates and forecasts of sustainable yield.
- Water quality is monitored through the Victorian Water Quality Monitoring Network in a number of forest streams. Data from this are used to detect trends in water quality and yield in forested catchments.
- Regeneration surveys of logging coupes are a requirement under the Code of Forest Practices for Timber Production. Surveys are required to be carried out on each harvested coupe within three years of regeneration treatment. The survey technique involves small plots on an 80m x 20m systematic grid, and determining the percentage of stocked plots. For a coupe to be satisfactorily stocked, at least 65 percent of plots must be stocked. Under-stocked coupes are re-treated until they meet the specified standards. Regeneration survey results are periodically published in NRE technical reports.
- Overall changes in forest cover using remote sensing.
- A pest management information system (PMIS) records pest infestations and the effectiveness of control programs.
- A long-term monitoring program to investigate disease gap dynamics of Myrtle Wilt and rates of disease development across Victoria.

Some areas of monitoring are addressed through research projects because of the time scale and complexity of forest attributes and processes under management (see section on research under Review and Improvement).

Assessment

While NRE has extensive information on the forest environment and has various specific monitoring programs, the development of sustainability indicators is essential in order to assess whether stated forest management objectives are being met.

While many indicators are implicit in current management plans, specific indicators are required for monitoring biodiversity, health and vitality of forest ecosystems, soil and water resources, and social and cultural values. Indicators need to be sensitive to, and representative of, ecological change at strategic operational scales. The applicability of currently collected data for this purpose will also need to be assessed.

Monitoring is required to assess whether prescriptions such as habitat tree retention, linear reserves and streamside buffers achieve their desired objectives in the longer term.

The monitoring of road and track condition on public land is inadequate, leading to risks to soil and water quality. This is especially the case for those pre-dating the Code of Forest Practices.

Reference Areas have the potential to be valuable for monitoring long-term changes in forest ecosystems. A detailed inventory of the Reference Area system is required including an assessment of its representativeness, extent of replication, and the degree to which it provides reliable examples of forests affected by humans.

3.4.4 AUDITING OF COMPLIANCE WITH REGULATIONS AND CONTROLS

The following operational components of Victoria's environmental management system are subject to a formal auditing process.

Code of Forest Practices for Timber Production, and Regional Prescriptions

Since 1994, NRE has implemented a regular internal auditing process for timber harvesting operations. This includes auditing of coupe planning (and compliance with the forest management plan), compliance with the Code of Forest Practices, prescriptions for the Control of Timber Harvesting and Forest Coupe Plans, and record keeping. At least one Forest Management Area (FMA) in each of the four major regions of the State is audited each year. On average, each FMA is audited at least once every three years.
Features of the audit include:

- formal description of the process in a procedural document;
- supervision by the Scientist, Code of Forest Practices;
- selection of the audit team from outside the Forest Management Area subject to audit, including an experienced forest officer, an experienced professional forester, and an experienced field officer from either Flora and Fauna or Catchment and Agricultural Services;
- presentation of the results to the Director, Forests Service; and
- public release of a summary of the audit outcomes (the detail of the audit is treated confidentially as it involves the performance of individuals).

The audit aims to promote improvement of performance. Hence, the person in charge of each coupe is present to answer questions and assist the auditing team. This has led to a positive acceptance of auditing by field staff.

Log grading

The Department has carried out several audits of log grading performance over the past several years leading to a review of log grading responsibilities. These have been treated confidentially because of the highly sensitive commercial nature of the audits.

Code of Practice for Fire Management

Application of the Fire Code is to be formally audited at least every five years and the audit must include a formal assessment of compliance. The Code includes a list of performance indicators for this purpose.
An audit system is planned for fire operations as part of the current revision of planning and other management arrangements.

Exploration and Mining

Compliance with the conditions of exploration and mining licences is addressed in Chapter 2.

Assessment

There are no formal processes for routine and regular audit of compliance with some Departmental policies and plans. Periodic audits are necessary for these. A strength of the auditing system in State forests is that a summary of results is made public and that substantial penalties are possible for breaches. NRE's internal audit of timber harvesting and log grading operations is an appropriate and effective means for assessing compliance with

the Code and prescriptions. The use of staff from outside the region subject to audit is a strength .

Consideration should be given to increasing the transparency of audits by making the results of audit processes publicly available along with measures taken to address deficiencies, and by increasing the independence of the audit teams. Log grade audit results should be published. Consideration should be given to independent log grading procedures, where appropriate related to the audit of the Code outlined above. The number of coupes audited may be too small to adequately sample the full range of environmental conditions under which problems may occur. Code audits should cover both public and private land, including plantations.

The Department's monitoring systems provide a sound basis for ensuring forest regeneration, however, assessment of other sustainability indicators could be undertaken during regeneration assessments to monitor the effects of forest operations.

3.4.5 CORRECTIVE ACTION

Corrective actions concerning planning and implementation include:

- review of operational prescriptions, procedures, and initiation of research in response to audit findings, monitoring of implementation of plans and programs and results of regeneration performance;
- internal supervision in relation to Annual Service Agreements, e.g. annual burning plans must accord with strategic fire management plans;
- supervision of field operations by departmental officers (e.g. logging coupes, roadworks, log grading checks); and
- enforcement patrols to detect unauthorised activities (eg illegal removal of timber, flora and fauna) in parks or State forest.

Assessment

To improve transparency, NRE should better document the corrective actions taken to address the findings, conclusions and recommendations resulting from monitoring, auditing and other reviews.

3.5 REVIEW AND IMPROVEMENT

Continual review and improvement of the forest management system are required in response to:

- changing legislation and government policies,
- shifting community expectations,
- advances in science and technology,
- changing market conditions, and
- results of monitoring programs, research and development.

In Victoria this is achieved by ongoing review of the environmental management system and through research and development.

3.5.1 REVIEW OF THE ENVIRONMENTAL MANAGEMENT SYSTEM

Responsibility for overall review of NRE and Parks Victoria's systems rests primarily with senior managers and the Victorian Government. The review function overlaps with other internal processes of performance monitoring and corrective action.

Ongoing review involves:

- continual review and refocussing of corporate priorities in response to legislation and government policy;
- evaluation of the achievements of each Departmental business unit against planned goals and objectives;
- annual review of research and development programs to set new research priorities in response to new issues; and
- review of legislation, strategic and operational plans as set out in Table 5.1.

There is no formal departmental process for reviewing the management system components in relation to the above requirements.

Annual reports of NRE and Parks Victoria business units, performance reports on implementation of strategic plans and major programs, results of audits of compliance with the Code of Practices, and research findings provide the information for the review of the environmental management system on both public and private lands.
For further information on the specific review process for individual system components, refer to the appropriate section under Planning.

Assessment

A process for reviewing the forest management system components has not been formally developed by NRE. A process with appropriate reporting mechanisms, such as a 'state of the forests' report', is required to ensure continuous review and improvement of the management system. This would be in keeping with developments in forestry organisations throughout the world.

The scientific basis of those parts of the management system which generate greatest environmental risk or are subject to contrary scientific interpretations, together with those where scientific knowledge is advancing rapidly should be subject to more frequent peer review.

Table 5.1 Review of Environmental Management System Components

System Component	Term	Transparency and Reporting
Legislation and Government Policies		
Various legislation and policies	na	Parliamentary debate; public report
Code of Forest Practices	10 years	Full public consultation; public report
Code of Fire Practices	10 years	Full public consultation; public report
Strategic Plans		
Regional Forest Agreement	20 years (5-yearly performance)	Full public consultation; public report
LCC studies	na	Full public consultation; public report
Forest Management Plan	10 years	Full public consultation; public report
Parks Management Plan	10 years	Full public consultation; public report
Fire Protection Plan	10 years	Full public consultation; public report
Action Statements	5-10 years	Peer review; public report
Sustainable Yield	5 years	Peer review; public report
Inventory Program	5-7 years (annual review)	Peer review; internal report, but publicly available
Research Program	3 years (annual review)	Peer review; internal report, but publicly available
Internal Operating Guidelines and Policies		
Regional Prescriptions for Timber Harvesting	ongoing review	Input from scientific experts; internal report, but publicly available
Harvesting	ongoing review	
Other guidelines and operational policies	na	Input from scientific experts; internal report, but publicly available
Operational Plans		
Wood Utilisation Plans	3 year rolling	Opportunity for public input internal report, but publicly available
Forest Coupe Plans (timber)		
- public land	1-24 months	Internal report, but publicly available
- private land	1-24 months	Internal report, but publicly available
Burning and New Fire Protection Works	3 year rolling	Opportunity for public input; internal report but publicly available
Other NRE Operations Plans	1-12 months	Internal report, but publicly available

3.5.2 RESEARCH AND DEVELOPMENT

Each year, NRE enters into an annual service agreement with the Centre for Forest Tree Technology to provide research according to a three-year research and development strategy. The strategy is developed following extensive input from policy, planning and research staff and has an annual budget of approximately $1.5 million (5 per cent of discretionary funding available to the Forest Service). The 1994-97 strategy is available on request to the public, and is due for review in 1997. The strategy plan outlines research and development programs and projects in seven subject areas:

- flora and fauna,
- soils and water,
- fire ecology and fire management,
- eucalypt silviculture,

- management science and socio-economics,
- integrated development, and
- cooperative extension and advisory services.

Research into the development of sustainability indicators within each of these domains will be a high priority in the coming years. Joint projects are being developed with other research providers to develop and test some core indicators using NRE funds supplemented by Wood and Paper Industry Strategy (WAPIS) and Forest and Wood Products Research and Development Corporation (FWPRDC) funding.

These studies are supplemented by research commissioned by the Flora and Fauna Branch, the Land Conservation Council, Heritage Victoria and Aboriginal Affairs Victoria.

Formal review of progress towards delivery of research program outputs is carried out at least twice during the financial year. Informal review of individual projects occurs on a regular basis. The results of research and development are incorporated into planning and operational processes as they become available. This technology transfer is facilitated by Research and Development Action Groups which meet at regular intervals to ensure that research information is being utilised and incorporated into relevant policies, plans and guidelines.
Collaborative research projects are developed between NRE and the Commonwealth Scientific Industrial and Research Organisation (CSIRO). The progress of research is reviewed annually by CSIRO internally and by the CSIRO Division of Forestry and Forest Products Advisory Committee. Research projects are typically medium-term (3-5 years or more).

Assessment

NRE's research program clearly links to providing information for improving strategic planning and reducing environmental risks in forest management.
General areas for improvement include:

- A stronger commitment to the timely completion, appropriate peer review and publication of scientific research.
- Better mechanisms to ensure that external advice is routinely sought, especially to cover those areas of expertise not well covered within the Department of Natural Resources and Environment. External peer review is a mechanism for increasing transparency in a system, and it is also a key component of any risk minimisation strategy.
- Allocation of funding to research based on assessment of environmental threats.
- Formal processes for ensuring that the most recent relevant information is used to assist management decisions.

A well defined long-term research and development program is needed. The most critical areas for research and development are:

- Research to underpin the scientific basis of the Code and the development of management prescriptions (especially their ‘local’ application).
- Identification of indicators at appropriate scales and methods to monitor environmental impacts of forest operations and long-term change in forest values to be monitored.
- Socio-economic studies of opportunities for forest product or recreation development.
- Development of fire regimes that reflect an understanding of the ecological outcomes.

- The effects of alternative silvicultural systems on biodiversity.
- Development of silvicultural systems for regrowth, covering both production and ecological aspects.
- Refinement of management prescriptions for Special Management Zones.
- The contribution of forests to global carbon cycles as part of an integrated national study.
- The relationship between Ecological Vegetation Classes and biodiversity.
- Validation of old-growth forest mapping.
- Prediction of habitat requirements for sensitive flora and fauna.
- The responses of fauna and flora communities and ecosystems to disturbance including timber harvesting and fire.
- Development of indicators of soil damage caused by harvesting machinery to strengthen the scientific basis of the Code.
- Stem degrade following harvest damage and broad-scale levels of defect and the factors affecting it in regrowth forests.
- The effects of forest management on water yield in specific forest areas where communities are dependent on forested catchments for their water supply.

4 OVERALL APPRAISAL

The appraisal below was prepared by Professor Ian Ferguson as part of his independent review of the Statewide ESFM report (terms of reference are given in Section 1.2 above). This appraisal was made in addition to a number of comments incorporated into the Statewide report, and it should be read in that context. Given that it was an independent peer review, the views contained in this appraisal are not necessarily those of the Victoria RFA Steering Committee or of the Commonwealth or Victorian Governments.

'Victoria has all of the major elements in place for appropriate systems and processes for ecologically sustainable forest management. Having said that, however, there is still considerable scope for further improvement. Forest-related legislation needs review to bring some aspects up-to-date and to make it more comprehensible to the public. Land use planning processes need refinement in the light of changes in bureaucratic structures and current needs. Closer attention needs to be paid to strategic planning of the integration of reserve and off-reserve management. The purchasers of stumpage need to recognise the importance of competition in determining the price of publicly-owned native timber, and the role of contestable but renewable and transferable rights to timber supply from that forest. More training is needed to ensure that staff are adequately prepared for planning and management under ecologically sustainable forest management. More research is needed to assist in the resolution of various issues.'

'These are not major or exceptional requirements: they are the measures required for continuing improvement in management systems. The extent and rapidity of adoption will be dictated by

- the economic viability of the commercial activities and the capacity to fund improvements in forest management through productivity gains,
- the resources available for improvements in non-commercial management activities,
- the support that the public at large gives to the economic, environmental and social outcomes, and
- the commitment of Governments, the timber industry , and the bureaucracy to the process.'

'In an era when resources for non-commercial activities are becoming scarcer and more competitive, there are concerns about the capacity for the system to fund adequately the improvements needed for management of an extended National Reserve System and the better integration of reserve and off-reserve management for all forest values. The formation of Parks Victoria may provide a basis for improved productivity that will enable existing resources to stretch further but the division of responsibilities between it and the NRE is still unclear. The additional resources required should not be underestimated.'

'Victoria is in a good position to deal with these issues providing it remains adaptive and accepting that sustainable forest management is a goal to be pursued vigorously, not an antique to be admired.'

REFERENCES

Burgman, M.A., and Ferguson, I.S. (1995). *Rainforest in Victoria - a review of the scientific basis of current and proposed protection measures.* Forest Service Technical Report 95-4. Department of Conservation and Natural Resources, Victoria.

CFL (1987). *Interim Guidelines and Field Management Prescriptions for the Conservation of Leadbeater's Possum in the Timber Production Ash Forests.* Public Lands and Forests Division and National Parks and Wildlife Division, Department of Conservation, Forests and Lands.

CNR (1995a). Forest Management Plan for the East Gippsland Forest Management Area. Department of Conservation and Natural Resources, Victoria.

CNR (1995b). *Proposed Code of Forest Practices for Timber Production.* Department of Conservation and Natural Resources, Victoria.

CNR (1995c). *Code of Practice for Fire Management on Public Land*. Department of Conservation and Natural Resources, Victoria.

CNR (1995d). *Community Awareness Strategy*. Department of Conservation and Natural Resources, Victoria.

Commonwealth of Australia (1992a). *National Forest Policy Statement. A New Focus for Australia's Forests.* Australian Government Publishing Service, Canberra.

Commonwealth of Australia (1992b). Intergovernmental Agreement on the Environment, May 1992. AGPS, Canberra.

CSIRO (1995). *Review of the Code of Forest Practices For Timber Production.* Department of Conservation and Natural Resources, Victoria.

DCE (1992a).orest Management Pland for the Otway Forest Management Area, Department of Conservation and Natural Resources, Victoria.

DCE (1992b). Draft Flora and Fauna Guarantee Strategy - Conservation of Victoria's Biodiversity, Department of Conservation and Natural Resources, Victoria.

ESDWG (1991). pp. 36-37, *Ecologically Sustainable Development Working Groups, Final Report - Forest Use*, November 1991. AGPS, Canberra.

Ferguson I, La Fontaine B, Vinden P, Bren L, Hateley R, Hermesec B. (1996). Environmental Properties of Timber, p. 4, Forest and Wood Products Research and Development Corporation.

Government of Victoria (1986). *Victorian Timber Industry Strategy.* Victorian Government Printing Office, Melbourne.

Honeyman, R. (1996-5). *Corporate Geospatial Data Library, Summary Report.* Conservation and Natural Resources, Natural Resource Systems Branch, Victoria.

JANIS (1996). Proposed Nationally Agreed Criteria for the Establishment of a *Comprehensive, Adequate and Representative Reserve system for Forests in Australia.* Joint ANZECC/MCFFA National Forest Policy Statement Implementation Sub-committee, Canberra.

LCC (1991). *Rivers and Streams Special Investigation Final Recommendations*, Land Conservation Council of Victoria, Melbourne.

NRE (1996a). *Code of Practice, Code of Forest Practices for Timber Production.* Revision No. 2, November 1996. Department of Natural Resources and Environment, Victoria.

NRE (1996b). *Forest Management Plan for the Midlands Forest Management Area*, December 1996. Department of Natural Resources and Environment, Victoria.

RAC (1992). *Forest and Timber Inquiry*, Final Report, Volume 1, Resouce Assessment Commission, March 1992, AGPS.

Standards Australia (1995). Interim Australian/New Zealand Standard *Environmental management systems - General guidelines on principles, systems and supporting techniques.* AS/NZS 14004 (Int):1995. Published jointly by Standards Australia and Standards New Zealand.

VicRFASC (1996a). *Comprehensive Regional Assessment East Gippsland: Resource and Economics Report*. Commonwealth and Victorian Regional Forest Agreement Steering Committee.

VicRFASC (1996b). *Comprehensive Regional Assessment East Gippsland: Environment and Heritage Report*. Commonwealth and Victorian Regional Forest Agreement Steering Committee.

VicRFASC (1996c). *Comprehensive Regional Assessment East Gippsland: National Estate Report*. Commonwealth and Victorian Regional Forest Agreement Steering Committee.

VicRFASC (1996d). *Comprehensive Regional Assessment East Gippsland Methods Papers: East Gippsland National Estate Assessment* . Commonwealth and Victorian Regional Forest Agreement Steering Committee.

VicRFASC (1997a). Central Highlands Comprehensive Regional Assessment Report. Commonwealth and Victorian Regional Forest Agreement Steering Committee.

VicRFASC (1997b). *Comprehensive Regional Assessment Central Highlands: National Estate Report*. Commonwealth and Victorian Regional Forest Agreement Steering Committee.

Woodgate *et al.* 1994. Woodgate, P.W., Peel, W.D., Ritman, K.T., Coram, J.E. Brady, A., Rule, A.J. and Banks, J.C.G. (1994). *A Study of the Oldgrowth Forests of East Gippsland*. Department of Conservation, Forests and Lands, Victoria.

World Commission on Environment and Development (1987). *Our Common Future*, (the Brundtland Report), Oxford University Press, U.K.

Young, M.D. (1993). For Our Children's Children: Some Practical Implications of Inter-Generational Equity and the Precautionary Principle, Resource Assessment Commission

Occasional Publication Number 6, November 1993. AGPS, Canberra.