

Assessment of management systems and processes for achieving ecologically sustainable forest management in New South Wales

A report undertaken for the NSW CRA/RFA Steering Committee
April 1998



ASSESSMENT OF MANAGEMENT SYSTEMS AND PROCESSES FOR ACHIEVING ECOLOGICALLY SUSTAINABLE FOREST MANAGEMENT IN NEW SOUTH WALES

INDEPENDENT EXPERT WORKING GROUP
on behalf of the NSW ESFM Group

**A report undertaken for the NSW CRA/RFA Steering Committee
project number NA 18/ESFM**

April 1998

Report Status

This report has been prepared as a working paper for the NSW CRA/RFA Steering Committee under the direction of the ESFM Technical Committee. It is recognised that it may contain errors that require

correction but it is released to be consistent with the principle that information related to the comprehensive regional assessment process in New South Wales will be made publicly available.

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FOREWORD

This report has been prepared by an expert working group for the NSW ESFM Group and joint Commonwealth–NSW Steering Committee for the Eden Regional Forest Agreement. The report examines the management arrangements underpinning the delivery of ecologically sustainable forest management on a statewide basis.

The report is only part of the overall assessment of ecologically sustainable forest management as outlined in the New South Wales Options Report. Together with stakeholder input, it will provide a starting point for Commonwealth and State consideration and development of ecologically sustainable forest management leading up to the Regional Forest Agreement for the Eden region and other RFA Regions.

The expert working group addressed fundamental issues relating to the principles of ecologically sustainable forest management defined by the NSW ESFM Group and conducted its assessment at a time of substantial environmental legislative reform and departmental restructuring.

The report adopts a ‘systems’ approach to the assessment rather than seeking to catalogue and assess specific on-ground practices. The group was asked to focus its assessment on identifying areas of improvement within existing management arrangements that will lead to ecologically sustainable forest management.

The report has not been assessed in detail by the Steering Committee and does not necessarily reflect the views of either the committee or the Commonwealth and New South Wales Governments.

The NSW ESFM Group would like to thank the expert working group for this report which will greatly assist the Commonwealth and NSW Governments to progress the regional forest agreement process.

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EXECUTIVE SUMMARY

This report is the result of an independent assessment of the systems and processes currently being used to manage forests in New South Wales. The assessment, undertaken by an expert working group, was to evaluate the ability of these systems and processes to manage forests in an ecologically sustainable manner. The report will be considered by the NSW ESFM (ecologically sustainable forest management) Group and the joint Commonwealth/State Steering Committee that oversees the comprehensive regional assessments (CRAs) of forests in New South Wales.

Each assessment forms the basis for the development of a bilateral regional forest agreement between the New South Wales and Commonwealth Governments. These agreements will cover the major forests of the State and will strive to provide a balance between conservation and ecologically sustainable use of forest resources.

The expert working group assessed the capacity for ecologically sustainable forest management in New South Wales against a set of five principles within a framework of five management system components. Those components are consistent with an environmental management system and the five principles encompass important environmental, social and economic values. The assessment focused on the ability of management systems and processes to ensure ecologically sustainable forests, and not on evaluating the outcomes of forest management.

The expert working group made no assessment of the ecological sustainability of management of cultural heritage values, including Aboriginal cultural heritage values contained within Principle 1G. Cultural heritage values are currently being assessed by the NSW Cultural Heritage Working Group through the project, 'Protecting Cultural Heritage Values and Places in NSW Forests'. When completed, this project will need to be reviewed in terms of ecologically sustainable management and recommendations for managing

cultural heritage values in an ecologically sustainable manner will need to be implemented. Appropriate action in relation to these issues will need to be addressed in the regional forest agreement.

There is no simple or precise definition of ecologically sustainable forest management because the scientific basis for determining the level of forest values required for ecologically sustainable forest management is at an early stage of development. In the absence of such levels of sustainability, it is difficult to determine that management processes and systems are ecologically sustainable. Additionally, community perceptions of what constitutes ecologically sustainable forest management will vary over time.

Under the regional forest assessment process in New South Wales, the setting of targets for environmental, social (including cultural heritage) and economic values designed to achieve ecologically sustainable forest management is based on stakeholder consensus and compromise using information obtained from comprehensive assessments of forests on a regional basis. To achieve ecologically sustainable forest management, the scientific basis for the maintenance of forest values and outputs (for example, viability of species populations, a sustainable wood supply) will be required. The relative weighting given to forest values will also need to vary locally and with time.

The expert working group has assessed the adequacy of current forest management systems and processes and has identified areas where cost effective improvement is necessary. It should be noted that by nature such an analysis tends to focus on deficiencies, with achievements taken for granted.

Overall, the group concludes that the systems and processes currently being used to manage forests in New South Wales need significant improvement to achieve the recently defined

requirements for ecologically sustainable forest management. The large number of agencies involved in forest management and its regulation, combined with some outdated and unwieldy legislation relating to forests on public land, has resulted in overlapping and poorly defined responsibility, and poorly coordinated, inefficient forest management. An emphasis on regulation has adversely affected strategic planning but has resulted in comprehensive but potentially overly-precautionary protocols for protection of biodiversity, soil and water values in forests used for wood production. A code of practice is used to guide harvesting in State forests, but the systems for effectively implementing codes need further development, and their coverage must be extended to include all forested tenures.

Mechanisms for the effective management of the proposed comprehensive, adequate and representative (CAR) reserve system or for complementary management of adjoining forest areas are not well developed. The information base and consultative mechanisms for establishing the balance between environmental, economic and social values on public land need significant improvement.

Current processes for ensuring ecologically sustainable management of private forests are poorly developed. The recently enacted *Native Vegetation Conservation Act 1997* represents an effective tool for making improvements in this area. There are concerns, however, about the adequacy of resources and information available for the regional planning that is required to achieve forest management that is ecologically sustainable.

The expert working group's suggestions for improving current management practices are in the form of a series of recommendations distributed throughout the body of the report. These recommendations have been synthesised into 13 key recommendations that appear below. They are cross-referenced to the relevant sections of the report and other recommendations contained therein. A complete list of recommendations is contained in Appendix B.

KEY RECOMMENDATIONS

Legislation

Key Recommendation 1:

A whole of government process to develop natural resources legislation should be put in place. Parts

3 and 4 of the *Environmental Planning and Assessment Act 1995* should be considered as a potential vehicle for integrating natural resource management in view of the following characteristics of that legislation:

- broad plan-making powers;
- a well-developed assessment procedures and approvals process;
- a well-understood system of community participation including review by the courts;
- potential to move beyond constraints on land use to active management;
- potential applicability to both public and private land.

In the short term, to reduce complexity at the level of operational regulation and as a move towards a 'one-stop shop':

- there should be a review of separate requirements for approvals under existing legislation with a view to replacing them with concurrence procedures.

[See Chapter 2, recommendation 2.5].

Information management

Key Recommendation 2:

Information collation, analysis, communication and dissemination for delivery of ecologically sustainable forest management in New South Wales should be improved by:

- storing, analysing and disseminating State-wide information required for delivering ecologically sustainable forest management, including all existing digital, biophysical, socio-economic and cultural heritage data;
- developing protocols for data collection;
- maintaining standards of data quality, storage and transfer;
- identifying gaps in current knowledge;
- guidance on data 'capture' (collection) and inventory activities;
- better training and advice to staff by agencies
- facilitating the free exchange of data between government agencies and making data available to stakeholders, local councils, and the public; and

- provision of existing information to interested parties for the cost of data retrieval and handling.

A single forest resource information unit should be created within the New South Wales Government to take responsibility for information management.

[See Chapter 3, recommendations 3.1–3.4].

Public participation in forest use decisions

Key Recommendation 3:

The expert working group acknowledges the benefits of direct stakeholder participation in negotiated outcomes. The opportunity for public comment in decision-making processes should be focused at the strategic planning level, for example:

- environmental planning instruments (including regional vegetation management plans);
- strategic management area plans (including both forest and park management plans); and
- cross-tenure threat abatement and species recovery plans.

Greater attention should be given to ensuring that those nominated to membership of consultation committees adequately represent stakeholder interest.

Regional managers should negotiate with Aboriginal groups on the most appropriate ways for them to contribute to the formulation of strategic plans.

Opportunities for public participation at other levels should be confined to situations where there is likely to be a significant effect on the environment and where decision-making processes have not been properly implemented.

In order to facilitate the regional forest agreement process and forest management after agreements are negotiated, ongoing formal processes (such as regional forest forums) need to be strengthened to raise awareness and understanding of ecologically sustainable forest management and how it can be achieved in New South Wales forests.

[See Chapter 4, recommendation 4.2].

Costing of ESFM

Key Recommendation 4:

Improved mechanisms are needed for collecting and using information to enable cost-effective decision making. Accounting practices that allow full costing of all inputs to forest management should be developed. Without efficient costing of management efforts, the delivery of ecologically sustainable forest management components (environmental, social and economic) is at risk, and opportunities to develop more cost-effective procedures could be lost. Systematic trials to assess the cost-effectiveness of alternative operational prescriptions should be undertaken. In particular, ‘impact costing’ should be used to ensure stakeholders fully appreciate the cost implications of their expectations.

[See Chapter 3, recommendation 3.44].

Strategic planning for public forests

Key Recommendation 5A:

Strategic planning in public forests must be strengthened. While the format of plans prepared by the National Parks and Wildlife Service generally meets requirements for ecologically sustainable forest management, there is a need to complete plan preparation for all parks. For State Forests, a new strategic management area planning model able to deliver ecologically sustainable forest management needs to be developed. Such management area plans:

- must be developed by the responsible management agency;
- should initially draw on and be consistent with regional forest agreements;
- must be approved by the forest regulator (see later);
- should require an annual report to the regulator on achievements in relation to the plan;
- must be subject to periodic review (for example, at 5–7 year intervals) or as required by exceptional circumstances, and
- after review, should be resubmitted to the forest regulator for approval.

The strategic management area planning process must:

- assess environmental impacts in sufficient detail to allow management plans to replace the environmental impact statement process;

- set targets (for example, sustainable yields, size of animal populations, degree of site disturbance);
- provide opportunities for public exhibition and comment;
- allow determination by the forest regulator; and
- provide opportunity for review by the courts.

This process would be ongoing, providing a basis for adaptive management and continuous improvement, and represent the primary public forum for discussion and involvement in forest management.

[Chapter 3, recommendation 3.46].

Key Recommendation 5B:

Given the distribution of forest across several land tenures, National Parks and Wildlife and State Forests should coordinate their approach to the management of the comprehensive, adequate and representative reserve system, often referred to as the CAR reserve system (which is based on criteria defined by JANIS, the committee established to ensure the implementation of the National Forest Policy Statement), (see also Key Recommendation 13B).

[See Chapter 3, recommendation 3.47].

Private land planning and management

Key Recommendation 6A:

The current system of project-based assessment and approval for private forests should be replaced by one based on:

- regional (cross-tenure) land use planning (for example, regional vegetation management plans);
- preparation of a private forest management plan;
- use of codes of practice for all significant activities within each planning zone;
- preparing private forestry management plans, where forestry is proposed on specific sites;
- enhanced monitoring by the forest manager; and
- periodic review of the private forest management plan and its outcomes in terms of ecological sustainability, undertaken by the forest regulator.

[See Chapter 3, recommendation 3.22].

Key Recommendation 6B:

The development of a regional approach to private forest management based on regional vegetation management plans and private forest management plans should be expedited. Improved vegetation management plans should use information derived from comprehensive regional environmental surveys that take into account the conservation status of forest ecosystems across all tenures and consider such elements as biodiversity, soil, water and cultural heritage. The vegetation plans must also acknowledge the fundamental distinction between clearing for agricultural and residential purposes and sustainable native forest management.

Committees preparing regional vegetation management plans must possess adequate technical expertise in relation to the science/practices involved in ecologically sustainable forest management. Processes to effectively capture relevant information need to be developed.

In terms of the forest resource, regional vegetation management plans must:

- assess effects of management practices on individual forest values at an appropriate scale, which may be larger or smaller than the area covered by the plan, when setting zone boundaries;
- include minimum targets consistent with regional determination of the comprehensive, adequate and representative (CAR) reserve system for retention of forest cover;
- indicate specific zones and procedures essential to meet CAR reservation targets for forest communities that are inadequately protected on public land;
- maintain or increase the values related to ecologically sustainable forest management above regional targets;
- identify areas of forest suitable for restoration;
- contain a requirement for monitoring compliance with plans;
- include coordinated cross-tenure plans for habitat corridors and links in and between forests across all tenures; and
- involve landholders at an early stage in the planning process.

Private forest management plans should be prepared according to strict guidelines that:

- include systematic vegetation, habitat and fauna surveys as a foundation for planning;
- implement standardised 'clearing codes' to maintain forest connectivity across tenures;
- maximise opportunities for development trade-offs in urban areas as an incentive for conservation.

[See Chapter 3, recommendation 3.24].

Key Recommendation 6C:

Private forest management plans and threat abatement plans should be prepared to an approved standard and approved by the forest regulator.

[See recommendation 8A and 8B].

[See Chapter 3, recommendation 3.25].

Key Recommendation 6D:

Compulsory codes of practice designed to achieve sustainable management of private native forests must be put in place. An appropriate vehicle would be a State environmental planning policy.

[See Chapter 3, recommendation 3.26].

Key Recommendation 6E:

Development proposals for forests should be exempt from requirements to undertake 8-point tests and environmental impact statements where:

- they are within specified zones identified on proposed regional vegetation management plans and are incorporated into local environmental plans and regional environmental plans;
- comprehensive regional environmental surveys have been undertaken;
- impacts of activities are known with a high level of scientific certainty;
- approved codes of practice have been adopted for the proposed activities; and
- effective monitoring and enforcement procedures are in place.

[See Chapter 3, recommendation 3.5].

Management of forests to protect conservation values

Key Recommendation 7:

Consistent with the intent of the National Forest Policy Statement and the nationally agreed JANIS conservation criteria for forests, conservation targets should be met through a combination of dedicated forest reserves, areas protected within State forests, and areas zoned for management by special prescription. Increased consideration should be given to the capacity of forest areas outside national parks and reserves, often referred to as 'non-dedicated' or 'off-reserve' forest, to contribute to meeting conservation targets, because in some circumstances this 'off-reserve' component can result in enhanced and more balanced ecologically sustainable forest management outcomes. Resources should be committed to quantifying the potential of carefully managed private native forests to contribute to conservation objectives.

While establishment of a comprehensive, adequate and representative system of forest reserves represents a significant step in achieving protection of conservation values, active on-going management of the reserve system is also crucial. Increased emphasis must be given to managing the biological resource for specified objectives, taking into account the contribution of all tenures.

[See Chapter 3, recommendation 3.43].

Management of threatening processes

Key Recommendation 8A:

Threat abatement plans must be prepared for all recognised major threatening processes (including fox and cat predation, clearing on private land, loss of tree hollows, grazing, frequent burning, weed invasion and disturbance by exotic animals) as a matter of urgency (within three years). These plans should be prepared prior to or concurrently with recovery plans prepared for individual threatened species significantly affected by these processes. Recovery plans should be prepared for groups of threatened species affected by common threatening processes and prioritised according to extinction risk. Consideration should be given to extending completion dates for individual recovery plans for threatened species at low risk.

[See Chapter 3, recommendation 3.17].

Key Recommendation 8B:

A threat abatement unit should be created to develop regional cross-tenure threat abatement plans (to counter significant threatening processes) and to implement recovery plans for threatened species.

[See Chapter 3, recommendation 3.14].

Codes of practice**Key Recommendation 9:**

Application of effective codes of practice to guide planning and operations is critical to achieving ecologically sustainable forest management, but currently codes are only applied in a significant way in public wood production forests.

The role of codes of practice in supporting the implementation of ecologically sustainable forest management in New South Wales should be expanded by:

- developing and approving legally binding codes to address all important activities across all land tenures in New South Wales forests, including wood production, conservation reserve management, grazing, pest management and clearing.
- ensuring that such codes contain sufficient detail to guide protection of environmental values at appropriate scales;
- providing adequate resources to expedite the development of such codes and their effective implementation in forested areas;
- implementing codes within the framework of an environmental management system in public forests to facilitate:
 - agencies and organisations implementing codes to demonstrate compliance with codes through independent means;
 - regular public review processes to ensure that codes reflect continual improvement and best-practice concepts.

[See Chapter 3, recommendations 3.18 - 3.20].

Monitoring ecologically sustainable forest management**Key Recommendation 10:**

All New South Wales government departments with a direct forest management responsibility should implement long-term monitoring programs so as to be able to track changes in important

forest values. Monitoring methods must be able to detect changes at spatial and temporal scales that are significant for ecologically sustainable forest management. A set of key indicators for ecologically sustainable forest management should be selected, used and subject to ongoing improvement. These indicators should be compatible with the regional framework and the core set of indicators developed by the Montreal Process Implementation Group, a national committee working to identify criteria and indicators for reporting ecologically sustainable forest management. Supplementary indicators that cover additional locally important values should also be used.

The setting of targets (for example, sustainable yields, size of animal populations, degree of site disturbance) essential to interpreting effects of forest management on forest values should occur as part of the strategic planning process.

[See Chapter 6, recommendation 6.1].

Environmental management system**Key Recommendation 11:**

All New South Wales departments with direct forest management responsibility should develop and implement a recognised (and certifiable) environmental management system. Further details of the requirements for implementation of such a system can be found in Chapter 7 and Appendix A. The environmental management system is essential to ensure continual improvement of forest management ('adaptive' forest management) and to permit effective audits that demonstrate compliance with principles and regulations for ecologically sustainable forest management.

Essential components of adaptive forest management that are currently poorly developed and need to be strengthened to include performance measures that can gauge whether management is ecologically sustainable and review processes that will lead to continual improvement in the management system.

The results of applying the environmental management system and the outcomes of management plans should be publicly reported to raise community confidence that ecologically sustainable forest management is being achieved. Regulatory compliance should also be reported and subject to independent validation.

[See Chapter 5, recommendation 5.1].

Co-ordination of research and development

Key Recommendation 12:

Steps should be taken to achieve better coordination and effective use of resources allocated to research for ecologically sustainable forest management in New South Wales government agencies. Such action should lead to the formation of a single research unit that services the needs of both forest management and regulation. A single unit would improve research co-ordination and strengthen the focus on meeting the needs of ecologically sustainable forest management, which are often generic across tenures. The unit should undertake formal collaborative work with external research providers to enhance multidisciplinary research. There is merit in linking the proposed forest resource information unit to the activities of the research unit and in co-locating these two units.

[See Chapter 6, recommendation 6.4].

Institutional structures

Steps should be taken to separate existing forest regulatory and management functions and to improve the cost-effectiveness of regulatory procedures.

The expert working group recognises recent structural changes within the New South Wales forest management system and the need for some consolidation.

Key Recommendation 13A:

In the short term, an inter-agency coordinating group involving existing regulatory agencies should be established to:

- better coordinate planning in relation to cross-tenure issues;
- ensure consistency of plans with the regional forest agreement and other hierarchical components of the planning structure;
- coordinate the process of granting licences and approvals;
- coordinate independent audits of processes and outcomes;
- ensure better implementation and enforcement of regulations;
- improve response to public concerns about inadequate compliance with policies and codes; and

- effectively report to the public and government of the findings from audits.

However, even in the short term, it is essential that the following functions are managed and approved by a single agency:

- responsibility for ensuring that forests-related plans address management requirements for ecological sustainability and specify ecologically sustainable management targets (such plans include, for example, management area plans for public forests; regional vegetation and private forest management plans; and local and regional environmental plans);
- responsibility for establishing an effective code of forest practice system, including the approval of codes and methods for their implementation (see key recommendation 9);
- responsibility for ensuring that monitoring (by the forest manager) of agreed ecologically sustainable forest management outcomes is conducted (see key recommendation 10).

Within three years, the position of forest regulator should be established as a means of more effectively performing the above functions which are necessary for achieving ecologically sustainable forest management and to approve operations not adequately addressed by codes of practice or approved plans of management.

[See Chapter 2, recommendation 2.2 and recommendations in Chapter 5].

Key Recommendation 13B:

There is a need to strengthen cooperation and coordination between Government agencies so as to achieve integrated management for conservation, wood production and other values in both public and private forests. Specifically:

- active management across tenures of the comprehensive, adequate and representative (CAR) reserve system (formal and informal reserves and areas managed by prescription);
- complementary management of general wood production zones within State Forest;
- effective threat abatement practices;
- an appropriate balance between recreation and conservation;
- more effective management and use of resource information supporting ecologically sustainable forest management ;

- more effective use of expertise;
- support for private native forest management;
- better strategic management area plans;
- better coordination of research and development;
- more effective communication of ecologically sustainable forest management outcomes.

In order to promote cultural change within existing forest agencies, the formation of an interdepartmental coordinating committee may provide some interim benefit. However, in the medium-term, a more effective option would be the formation of a Natural Resources Management Agency with management responsibility for all public forested land and a support function for managers of private forested land.

This recommendation is contingent upon the creation and filling of the position of forest regulator in order to assist in maintaining a balance between forest uses. The proposed natural resources agency will be guided in balancing conservation and wood production objectives by objectives specified in RFAs, requirements of the external regulator, and by other government policy.

A logical corollary of the proposals in Recommendations 13A and 13B will be to extend them so as to cover not only forests but all natural resources. However, this is outside the expert working group's terms of reference.

[See Chapter 2, recommendation 2.3].

Key Recommendation 13C:

Private forest managers should be given assistance with the implementation of ecologically sustainable forest management, including:

- technical assistance in the preparation of conservation management plans, private forest management plans and individual timber harvesting plans;
- negotiation of conservation agreements; and
- the provision of advice and training in relation to codes of practice.

A Private Forest support Unit should be established to assist forest managers.

[See Chapter 2, recommendation 2.4].

INTRODUCTION AND METHODOLOGY

This chapter provides a description of the conceptual framework used to assess forest management systems and processes in New South Wales against the requirements for ecologically sustainable forest management.

The chapter also contains the principles of ecologically sustainable forest management (ESFM) as defined for New South Wales, the expert working group's interpretation of these principles as they were used in the assessment, and an historical perspective on forest management in New South Wales.

BACKGROUND

This report presents the results of an assessment of current forest management systems and processes in New South Wales for their ability to manage forests sustainably. The assessment was conducted by an independent expert working group.

The report will guide State and Commonwealth Governments on the improvements needed in existing forest management systems and processes to achieve ecologically sustainable management on a State-wide and regional basis.

Recommendations from the report will be considered in conjunction with those from other elements of the comprehensive regional assessments in the development and negotiation of regional forest agreements between the New South Wales and Commonwealth Governments.

Ecologically sustainable forest management

Ecologically sustainable forest management underpins the National Forest Policy Statement objectives (Commonwealth of Australia 1992b; p. 25). The operative rules for an assessment of ecologically sustainable forest management are:

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.

The NSW ESFM Group developed a working definition of ecologically sustainable forest management as a basis for the assessment. That definition is

Ecologically sustainable forest management (ESFM) is managing forests so that they are sustained in perpetuity for the benefit of society by ensuring that the values of forests are not lost or degraded for current and future generations.

To maintain the overall capacity of forests to provide goods and protect the full suite of forest values, forest on all land tenures must be managed for ecological sustainability. This can be achieved through:

- definition of agreed targets for biodiversity, wood production and other forest values at regional scales;
- a comprehensive, adequate and representative network of dedicated and secure nature conservation reserves for protecting biological diversity and other values;

- integrated planning processes and management systems on all tenures;
- application of appropriate codes of practice and environmental prescriptions;
- management plans incorporating sustainable yield harvesting practices; and

TABLE 1: NATIONALLY AGREED CRITERIA FOR ASSESSMENT OF ECOLOGICALLY SUSTAINABLE FOREST MANAGEMENT

ASSESSMENT CRITERIA	CRITERIA ⁽¹⁾ DESCRIPTION
System design to meet national principles of ecologically sustainable forest management ⁽²⁾	<p>The planning and management of native forests should:</p> <ol style="list-style-type: none"> 1. Maintain the full suite of forest values for present and future generations. 2. Maintain and enhance long -term 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.
Public transparency	<p><i>Scrutiny:</i> Type and level of scrutiny - parliamentary, administrative.</p> <p><i>Consultation:</i> Opportunity for public comment, individual stakeholder and group submissions, advisory group involvement in the process, information exchange, provision for feedback in consultation process.</p> <p><i>Access to information:</i> Process for access to information.</p> <p><i>Public involvement:</i> Opportunity for individual stakeholder or community groups to be involved in the decision-making process.</p> <p><i>Reporting:</i> Mechanism for reporting of processes and outcomes for all system criteria.</p>
Monitoring	<p><i>Trend measurements:</i> Process for assessment of change.</p> <p><i>Monitoring regimes:</i> Process for regular monitoring of indicators.</p> <p><i>Standards:</i> Process for designation of quantifiable measures against which the quality or performance of a characteristic or attribute is assessed.</p> <p><i>Performance targets:</i> Process for designation of specified goals.</p> <p><i>Performance verification:</i> Process for ensuring achievement of standards and targets</p>
Compliance	<i>Audit arrangements, penalties, incentives:</i> Processes that ensure compliance with stated goals or objectives.
Scientific and technical basis	<i>Mechanism</i> for assessing adequacy of information (for example scientific/peer review); <i>Process</i> for incorporation of information into decision making process.
Review	<i>Mechanism</i> for review, feedback and continual improvement, internal/external, periodicity.

(1) These criteria need to be applied at the appropriate ecological scales.

(2) The nine principles should be interpreted and applied in the context of the National Forest Policy Statement and other existing policy documents. Definitions contained in the National Forest Policy Statement apply to these principles. Planning and management of plantations should be consistent with the principles established by the Ministerial Council for Forest Fisheries and Aquaculture in the document, Forest Practices Related to Wood Production in Plantations: National Principles.

- management of native forests outside the reserve system to complement the objectives of managing the nature conservation reserve system (Commonwealth of Australia 1992).

ASSESSING ECOLOGICALLY SUSTAINABLE FOREST MANAGEMENT– CONCEPTUAL FRAMEWORK

Nationally agreed criteria for assessment of ecologically sustainable forest management (Table 1) were developed by officials of the Commonwealth and State Governments at the Comprehensive Regional Assessment Implementation Forum (CRAIF) in 1996, using the following as guides:

- the National Forest Policy Statement;
- Australian Forestry Council Principles for Environmental Care in Native Hardwood Logging;
- criteria and indicators of the Montreal Process (The Montreal Process 1995);
- Forest Stewardship Council principles and criteria for natural forest management (FSC 1995);
- outcomes of the United Nations Conference on Environment and Development (United Nations 1992); and
- the principles and guidelines of the International Standards Organisation's 14000 series, relating to environmental management systems (Standards Australia 1996).

Under the agreement, forest management systems are to be assessed for their ability to ensure forests are managed sustainably. These assessments are to be undertaken bilaterally by the Commonwealth and each State individually. Expert advisory groups are to be responsible for directing the: collection of information, assessment of existing management systems and processes against agreed criteria, and production of an independent report. The report will contribute to the overall assessment of the ability of forest management to manage forests sustainably. Additionally, joint Commonwealth/State project management groups will provide secretariat support for the group, including information collection and documentation; and joint Commonwealth/State RFA (regional forest agreement) steering committees will oversee the assessment process.

Using the nationally agreed criteria, the NSW ESFM Group developed a set of principles to be used in the assessment of management systems and processes for each tenure and forest use in New South Wales (see Table 2). Tenure includes conservation reserves, State forests, administrative reserves and private lands; use includes conservation, timber production, plantations, other forest produce, recreation and tourism, water, and mineral resources.

ENVIRONMENTAL MANAGEMENT SYSTEM COMPONENTS FOR ACHIEVING ESFM

A framework for the assessment was developed based on the International Standards Organisation's 14000 series, 14001/14004 Environmental Management Systems (EMS) (Standards Australia 1996). The components of an environmental management system are:

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

Commitment, legislation and policy framework

Under this component of an environmental management system, the legislative and policy framework of forest management should ensure that all forest values are protected and maintained in a balanced manner. The framework should ensure that principles of ecologically sustainable forest management are applied to meet Commonwealth and State Government obligations to international agreements, treaties and conventions, environmental¹ legislation and other regulatory instruments. Co-ordination of Commonwealth and State forest-related policies and legislative requirements may also be treated under this heading. Commitment of governments and departments should be assessed in terms of the development and application of legislation, policies, conventions and agreements which contribute to achieving ecologically sustainable forest management.

¹Environmental is used here in a broad sense to include environment, economic, social, resource and heritage values or attributes.

Planning

The principles of ecologically sustainable forest management should be reflected in the goals and objectives of plans. The planning process should provide a sustainable balance (i.e. within ecological constraints) between competing demands for all forest uses across all land tenures. Planning arrangements for ecologically sustainable forest management may require a hierarchy of strategic and operational plans at a

TABLE 2: NSW ESFM GROUP'S PRINCIPLES FOR ASSESSMENT OF FOREST MANAGEMENT SYSTEMS AND PROCESSES IN NEW SOUTH WALES

The five principles developed by the NSW ESFM Group for use in the assessment of forest management systems and processes in New South Wales are:

PRINCIPLE 1: Maintain or increase the full suite of values across the New South Wales native forest estate for present and future generations

The principle of intergenerational equity (that in meeting the needs of the present generation, the ability of the future generations to meet their own needs is not compromised) is embodied in this principle

- Ensure that ecologically sustainable forest management at the regional and smaller scales is implemented by ecologically appropriate planning and operational practices, and that ecologically sustainable forest management targets are set and indicators of performance are monitored.
- Ensure the long-term maintenance of the full range of values of the New South Wales existing forest estate. The intention is to maintain or increase not only the full range of values, but also the magnitude or level at which those values are maintained or increased.
- Encourage the increased production of plantation-grown timber and the social and economic benefits flowing from this increased production to supplement the wood supply from native forests.

Aims include:

A: Biodiversity

- biological diversity of forests at the ecosystem, species and genetic levels where biological diversity includes natural patterns of ecosystems, species and gene pools in time and space.
- address the requirements of vulnerable species, assist with the recovery of threatened species, and maintain the full range of ecological communities at viable levels.
- protect landscape values by the careful planning of operations and the reservation of appropriate patches and corridors of vegetation.

B: Productive capacity and sustainability of forest ecosystems

- maintain ecological processes within forests (such as the formation of soil, energy flows and the carbon, nutrient and water cycles, fauna and flora communities and their interactions)
- maintain or increase the ability of forest ecosystems to produce biomass whether utilised by society or as part of nutrient and energy cycles
- ensure the rate of removal of any forest products is consistent with ecologically sustainable levels
- ensure the effects of activities/disturbances that threaten forests, forest health or forest values are benign.

C: Forest ecosystem health and vitality

- reduce or avoid threats to forest ecosystems from introduced diseases, exotic plants and animals, unnatural regimes of fire or flooding, wind shear, land clearing and urbanisation
- promote good environmental practice in relation to pest management
- ensure the effects of activities/disturbances within forests, their scale and intensity, including their cumulative effects are controlled and benign.
- restore and maintain the suite of attributes (ecological condition, species composition and structure of native forests) where forest health and vitality have been degraded.

D: Soil and water

- maintain the chemical and biological functions of soils by protecting soils from unnatural nutrient losses, exposure, degradation and loss
- maintain the physical integrity of soils by protecting soils from erosion, mass movement, instability, compaction, pulverisation and loss
- protect water quality (physical, chemical, biological) by measures controlling disturbance resulting from forest activities
- identify and maintain at appropriate levels, water yield and flow duration in catchments

TABLE 2: NSW ESFM GROUP'S PRINCIPLES FOR ASSESSMENT OF FOREST MANAGEMENT SYSTEMS AND PROCESSES IN NEW SOUTH WALES (cont)

E: Positive contribution of forests to global geochemical cycles

Maintain the positive contribution of forests to the global geochemical cycle (including climate, air and water quality and deposition)

F: Long-term social and economic benefits

- maintain and enhance, on an ecologically sustainable basis, production of wood and wood products, including value adding, investment and resource security
- provided it is ecologically sustainable set, maintain or enhance the level of use of non-wood products and uses, including bee-keeping, grazing, mining, recreation and tourism, reliable water supply
- maintain and enhance, on an ecologically sustainable basis, the provision of employment and community needs such as economic diversification, investment skills, education, jobs stability, training and indigenous needs
- encourage the establishment and use of plantation forests on existing cleared land to expand social and economic values
- maintain and enhance the intangible social welfare benefits which forests provide.

G: Natural and cultural heritage values

- protect social, natural and cultural heritage values and sites, including aesthetic, landscape, historic, cultural, educational, scenic spiritual and scientific values and indigenous values and sites

PRINCIPLE 2: Ensure public participation, access to information, accountability and transparency in the delivery of ecologically sustainable forest management

- ensure public participation in decision-making processes at local, regional, State and Federal levels
- ensure comprehensive, timely and reasonable public access to information
- ensure transparency, openness and accountability in decision making processes and performance.

PRINCIPLE 3: Ensure legislation, policies, institutional framework, codes, standards and practices achieve ecologically sustainable management of

the native forest estate through requirements and/or by providing incentives

- establish a process for shared management and administration, recognising the customary and traditional rights of indigenous people and the interests of private landholders and other stakeholders in an area's management
- ensure compliance with stated goals and objectives.

PRINCIPLE 4: Apply 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 1992 p. 49, IGAE 1992) 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 the application of 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.

PRINCIPLE 5: Apply best available knowledge and adaptive management processes

- Ecologically sustainable forest management would utilise the concept of adaptive management and continuous improvement based on best scientific and expert advice and targeted research on critical gaps in knowledge, monitoring or evaluation.
- establish an effective process of monitoring.

NOTES ON THE PRINCIPLES

Transparency in a process is the degree to which the public or stakeholder groups understand the decision-making process and can see who is taking decisions.

Openness in a process is the degree to which it allows interested parties to participate in the decision-making process.

Accountability in a process is the ability to identify who is responsible for implementing agreed decisions.

range of scales (regional to coupe) to provide for the protection and management of all environmental, social, cultural and economic values. The assessment should focus on the extent to which planning processes at their various levels meet the principles for ecologically sustainable forest management, their transparency and openness to ensure public confidence, and the basis (scientific, technical, best available knowledge) upon which they are developed.

Implementation

Effective implementation of practices to achieve ecologically sustainable forest management depends on having the capabilities and support mechanisms that are necessary to achieve the objectives and targets of policies and plans. A number of factors must be assessed to determine the capability of governments and agencies and private forest managers, to deliver ecologically sustainable forest management. Such factors are: designation of responsibility for achieving objectives and targets; capacity to implement plans through adequate resourcing; operational controls over the implementation of plans; documentation and records keeping; effective communication practices; education; and knowledge, skills and training.

Information, monitoring and evaluation

Ecologically sustainable forest management needs to be supported by environmental and socio-economic databases containing information at relevant levels of detail and scales. To determine this, the type, currency, appropriateness and accessibility of information upon which strategic regional and smaller scale planning is based, should be assessed.

Processes for measuring and monitoring implementation of management plans and changes in environmental values as a result of forest uses, for evaluating and auditing the actual performance of management in relation to objectives and targets (compliance and conformance), and the capacity and capability of the management system to carry out corrective (and preventative) actions should be assessed. Audit processes applicable to different components of the management system should be assessed in relation to a number of factors: frequency of audit (which should be determined by the potential for environmental damage associated with the activity under management), the objectivity and impartiality of the audit process, the level of training of

management personnel, and the transparency of the audit process to the public.

Review and improvement

An important component of ecologically sustainable forest management is the commitment and capacity of the organisation to review and continually improve its environmental management system and its overall environmental performance. Processes that allow performance review and continual improvement through adaptive management, including short and long-term monitoring of management systems and environmental performance indicators, are required. Processes that facilitate the incorporation of new knowledge arising from research and development are integral to ecologically sustainable forest management. Processes enabling review and improvement should be assessed on the extent to which they allow the management system to change in response to changing legislation, advances in science and technology, changing expectations and requirements of interested parties, or lessons learned from environmental incidents and past practice.

METHOD OF ASSESSMENT

Current forest management systems and processes

The ISO 14000 series provides an environmental management system at an organisation² level only. The ISO model was adapted to incorporate the management elements of New South Wales Government agencies responsible for forest management and regulation.

Each of the three regulatory agencies (Environment Protection Agency, Department of Land and Water Commission and Department of Urban Affairs and Planning) and six management agencies (State Forests, National Parks and Wildlife Service, Rural Fire Services, Department of Mineral Resources, Department of Agriculture,

²An organisation can be Commonwealth and State Government organisations or statutory authorities, Governments, private or non-government organisations. For the purpose of ecologically sustainable forest management assessments, Governments and their administrative structures are to be assessed. Private organisations have not been included in ESFM assessments to date.

Sydney Water) prepared a spreadsheet containing detailed information on a range of attributes for each 'element' or aspect of forest management for which they are responsible, in relation to environmental management system components and the ecologically sustainable forest management principles (Table 3).

Agencies also provided overview statements describing their roles, responsibilities and inter-relationships, including a brief summary of areas for improvement in relation to ecologically sustainable forest management.

A library of source documents on agency management arrangements was compiled for use in the assessment.

The concept of ecologically sustainable forest management evolved following the Rio Declaration of 1992 and therefore post-dates the development of most forest management and regulatory agencies in New South Wales. As a result, not all management goals are specifically aligned with the principles of ecologically sustainable forest management.

Similarly, departmental structures have not been developed within the framework of an environmental management system, as such systems are a recent innovation (post-1987) and are still being refined.

For these reasons, it has not been possible to systematically describe the current forest management arrangements in relation to the principles of ecologically sustainable forest management and the guidelines for environment management systems.

Departmental restructuring and legislative changes during the course of the assessment made detailed documentation of the current systems and processes very difficult and of limited long-term value.

To complete the assessment within these constraints and the given timeframe, the assessment focused primarily on

- identifying areas of forest management and regulation within and between agencies that are most in need of improvement to achieve ecologically sustainable forest management; and
- developing recommendations that would provide the basis for delivery of ecologically sustainable forest management and continued improvement of New South Wales forest management.

Assessment by expert working group

An expert working group was appointed to independently assess existing management systems and processes of the kinds described above and produce a report that would contribute to the overall development of ecologically sustainable forest management in New South Wales. The experts were supported by a 'focus' group comprised of State agency and Commonwealth Government officers who assisted in the process of information collection and documentation, and by a Commonwealth secretariat during the preparation of the report.

Members of the expert working group and their areas of specialisation were:

Professor David Farrier (University of Wollongong), legislative framework (all levels of government)

Dr Ross Florence (visiting fellow ANU), ecology and silviculture

Dr Robert McCormack (CSIRO Forestry and Forest Products), forest management and planning (planning, controls, regulations, industry issues)

Dr John Raison (CSIRO Forestry and Forest Products), soil, water and site productivity (Chair of the group)

Mr. Stan Rodgers (consultant), environmental management systems (management system design, compliance, audit, review and improvement, etc.)

Dr Andrew Smith (consultant), forest fauna and flora conservation (flora and fauna, habitat, biodiversity and environmental issues).

The expert working group's assessment was conducted according to the Terms of Reference developed by the NSW ESFM Group (Table 4).

The assessment was conducted in two stages.

- in the first stage, regulatory and management arrangements were assessed in relation to an environmental management system
- in the second stage, management elements were assessed against the principles for ecological sustainability as developed for New South Wales.

Information for the assessment was collected in two ways: through background material provided by the five agencies under assessment and through interviews with staff of these agencies.

Briefings were not held with local government representatives. Information for the assessment of local government functions was provided by officers of the Department of Urban Affairs and Planning.

Submissions on early drafts of the report from industry, conservation groups, unions, and representatives of State and Commonwealth Governments on the NSW ESFM Group were considered by the expert working group before completion of the final report.

TABLE 3: MANAGEMENT ARRANGEMENTS OF NEW SOUTH WALES AGENCIES, CLASSIFIED TO ASSESS THEIR ABILITY TO SUSTAIN FORESTS ECOLOGICALLY

ESFM/EMS CATEGORY	DESCRIPTION
1. Management element	Individual elements of an agency's management arrangements
2. Status of element	Whether the management element is under development, in draft, current, or under review
3. Discretionary or compulsory	Whether the element is based on policy or legislation
4. Primary agency	Agency assigned primary responsibility under the legislation
5. Agency linkages	Relationship with agencies having secondary responsibility for the management element (NP&WS, SFNSW, DLWC, DUAP, EPA, Depts. of Bushfire Services, Aboriginal Affairs, Mineral Resources and Agriculture, Water Board, RTA, local government, other agencies and stakeholders)
6. Current function (pre-ESFM)	The objective(s) of the current management element. These cover – Mining and exploration; extractive industries; apiculture; grazing; flora (protected); old-growth; rainforest; threatened species, communities and processes; wilderness; natural and cultural (European) heritage; indigenous heritage; recreation and tourism; soil protection; water quality; air quality; fire; forest health and diseases; pest plants and animals; social and economic; plantation: harvesting, silviculture, roading and inventory; native forests: harvesting, silviculture, roading and inventory; farm forestry; public use/utilities; land use/resource allocation; regional development; policy development; environmental assessment; regulatory form; land protection; other
7. NSW ESFM Principles <i>P1– maintenance of the full suite of forest values</i> <i>P2 – public involvement, access to information, accountability and transparency</i> <i>P3 – Ensure processes achieve ecologically sustainable management of the native forest estate through requirements and/or by providing incentives</i> <i>P4 – Precautionary principle</i> <i>P5 – Knowledge and adaptive management</i>	Identifies the particular attributes of each principle addressed by the management element, i.e. biodiversity, productive capacity, forest ecosystem health and vitality, soil and water, global geochemical cycles, social and economic benefits, natural and cultural heritage values Whether and how the management element addresses transparency through scrutiny, consultation, access to information, public participation, documentation, reporting Whether the management element has a mandatory requirement or provides incentives through penalties, rewards or benefits to achieve ecologically sustainable forest management . Whether and to what degree the management element addresses the Precautionary Principle. Whether the management element has processes for assessment/review mechanism and/or incorporation of information
8. EMS* (ISO 140001) components <i>Component 1 - Commitment, legislation and policy</i> <i>Component 2 - Planning</i> <i>Component 3 - Implementation</i> <i>Component 4 - Measurement and evaluation</i> <i>Component 5 - Review and improvement</i>	Records the EMS component (1-5) the management element is equivalent to: National legislation/policy, state legislation, state and local govt. policies, departmental policy State-wide, regional, local, corporate, strategic, operational Accountability and responsibility; programs and budgets; operational control; documentation, records and reporting; knowledge, skills and training; communication and education; emergency preparedness Forest information; monitoring and evaluation of plans and programs implementation; monitoring condition of the forest environment and values; auditing; corrective action Review of the management system; continual improvement; research and development

TABLE 3: MANAGEMENT ARRANGEMENTS OF NSW AGENCIES, CLASSIFIED TO ASSESS THEIR ABILITY TO SUSTAIN FORESTS ECOLOGICALLY (CONT)

9. Tenure	State forest lands, national parks lands, other crown lands, private lands, other
10. Source document (title and page reference)	Bibliographic reference
11. General Description	Summary description of the management element in relation to ESFM

Notes

ESFM - Ecologically sustainable forest management

EMS - Environmental management system

TABLE 4: TERMS OF REFERENCE FOR THE NSW ESFM EXPERT WORKING GROUP

1. Assess the scope, quality and integrity of systems/processes applicable to forest management in New South Wales, and the degree to which they deliver ecologically sustainable forest management as directed by the NSW ESFM Group:	forest management in New South Wales management systems and processes.
<ul style="list-style-type: none"> – The assessment is to be structured and reported on the basis of management system components and assessment principles as developed by the NSW ESFM Group and agreed by the Steering Committee. – The objective of the assessment is to provide the basis for accreditation of management systems/processes and development of recommendations for improvement of forest management systems and processes where required to achieve ecologically sustainable forest management. The work will not focus on the detail of management practices pertaining to the various systems/processes. The performance of New South Wales management systems and processes in relation to management practices and other performance-based issues will be determined through complementary projects as described in broad project areas in the NSW ESFM Technical Framework. – Assess the effectiveness of current New South Wales management systems and processes in meeting the assessment principles. – Identify the strengths, significant gaps, deficiencies, duplication and opportunities for the delivery of ecologically sustainable 	<ul style="list-style-type: none"> – Recommend efficient and cost-effective options for improvements and actions to support strengths and address identified gaps or deficiencies in New South Wales management systems and processes to deliver ecologically sustainable forest management. <p>The expert working group, in undertaking the assessment, may consult with other parties as agreed with the NSW ESFM Group,</p> <ol style="list-style-type: none"> 1. The assessment is to cover all forest tenures, grouped appropriately, and significant forest uses for New South Wales as agreed with the NSW ESFM Group. The expert working group will take account of different management objectives and systems for different tenures and uses. 2. The expert working group will provide advice to the NSW ESFM Group on the structure of the assessment and background description of management systems and processes (refer Step 4 Project Specification: Guidelines for description of New South Wales management systems and processes.) 3. The expert working group will provide a Draft Assessment Report: Independent Assessment of New South Wales Management Systems and Processes. The report will include identification and recommendation of options for improvement of New South Wales forest management systems and processes to the NSW ESFM Group at an agreed date (refer Step 6 of Project specifications.)

4. The expert working group will provide a Final Assessment Report in an agreed format to the NSW ESFM Group at an agreed date.

HISTORICAL PERSPECTIVES

This section provides an historical perspective on forest management and nature conservation in New South Wales.

State forest management

The brief for the assessment required that the current policies, management systems and processes of State Forests of New South Wales be evaluated for their effectiveness in delivering ecologically sustainable silvicultural practice. As understanding the results of this assessment requires an appreciation of the present forest condition, and because that condition reflects the influence of forest policies, strategies and practices over many decades, it is appropriate at the outset to place current forest management in an historical context.

The Aboriginal people were the first ‘managers’ of the Australian forests. The relationship between the Aboriginals, the country and its resources was one of interdependence—sustaining the natural environment was crucial to Aboriginal survival. The open ‘woodland structure’ of many forests at settlement (wide-spaced, large-boled trees over a grassy forest floor) is widely attributed to regular low intensity Aboriginal burning, and undoubtedly this is one of the factors involved (Florence 1996). Indigenous peoples have continued their association with the forests through employment in the forest industry and through their protection of sacred places, such as Biamanga. They wish to continue to be part of the management of forests and ensure that their values are protected and managed for future generations.

From the 1880s, increasing importance was given to the establishment of a managed forest estate, and to forest assessment and harvesting control. At the time, the New South Wales management practices were dominated by three priorities: the need to eke out wood supply to industry by conserving part of the growing stock from harvest in favour of later cutting, to improve the productive condition of the growing stock and regenerate the forests (mainly by ringbarking non-commercial old-growth trees), and to control recurrent wildfire. While lack of resources during the Great Depression and the intervention of World War II curtailed these activities, good progress was made in bringing orderly management to the forests.

An expansion in professionally trained staff from the 1950s meant that substantial progress was made in forest inventory, yield regulation, and in the application of silvicultural and harvesting regimes designed to improve the forest condition. Programs to regenerate lower slope wet sclerophyll forest (‘gully conversion’) through clearing, burning and seeding began on some forests in the late 1950s, and greater attention was given to protecting areas of high conservation value through forest preserves, flora reserves and primitive reserves.

During the decades of rapid economic growth that followed World War II, demand could not be met from forests that had been brought under management before the war. All Australian governments committed themselves to meeting as much of the wood demand as possible—largely from previously unmanaged native forests. Doing so avoided unacceptable expansion in wood imports, maintained local industries and communities, and contained timber prices at a time of rapid inflation. Previously unmanaged (mainly old-growth) forests were harvested at rates well in excess of sustainable yields, and woodchip export programs were initiated, primarily to gain access to sawlogs from forests which could not be managed economically for sawlogs alone.

New South Wales came to accept an implicit strategy of ‘running down’ the sawlog supplying capability of the native forests, while rapidly developing an alternative and more efficient softwood resource. This may have been an effective wood production strategy under difficult demand-and-supply circumstances, but the seeds of environmental conflict were sown in this way. Nevertheless, and despite the wisdom of hindsight, it is difficult to see what else governments might have done at a time of rapidly escalating demand, and before the emergence of a broadly based environmental ethic.

Wood supply as the dominant management objective was reinforced through the Indigenous Forest Policy (Forestry Commission of New South Wales 1976). While the policy recognised other forest values and the need to manage for them, environmental objectives remained, in practice, secondary to those concerned with short-term wood supply. The old-growth mountain and escarpment forests were logged ‘to the limits of economic accessibility’ and the coastal region forests were subjected to continuing selection silviculture. Selection prescriptions were designed to conserve the species and trees with the greater

growth potential for later harvest. However, because of uncertainties about the demand for hardwood beyond the year 2000, the policy made little provision for expenditure on site regeneration treatments. Without effective regeneration of harvested forest, the continuity of wood supply for the long term was detrimentally affected.

Environmental objectives came to play an increasingly important role in formulating management strategies and plans through the 1970s and '80s. The commission employed its first wildlife research officer in 1979, introduced the first soil mitigation erosion controls for forest operations in 1975, and the first codes of logging practice and harvesting plans in the late 1970s. Multiple-use zoning (the 'preferred management priority' classification) was introduced in 1980, and the first environmental impact statement was prepared in 1984. The Native Forest Preservation Policy was ratified in 1984, and a Wildlife Conservation Policy formulated in 1987. While these were positive steps in environmental management, the prescriptions applied to general wood production zones did not take adequate account of the considerable ecological and structural diversity within the forests and could not be consistent with modern principles of ecologically sustainable forest management.

The effects on productivity of the Indigenous Forest Policy have been most notable in three situations: on sites where some form of post-logging site treatment was essential to obtain seedling regeneration, but was not applied; where selection logging generated a successional trend towards the more tolerant and generally less productive species (that is, the latter species 'took over' from the more valued timber species); and generally, where site production has been affected by sub-optimal levels of growing stock. Systems managing for ecological sustainability will need to deal with all these matters. Nevertheless, the expert working group accepts that selection management during this period helped maintain 'semi-natural' forests, creating a vegetational and structural framework within which future management could be directed effectively towards managing the forests sustainably.

State Forests of New South Wales is now in a critical transitional phase—moving from the strong timber orientation of the past to a system of management where environmental conservation has become the dominant objective. It is fortunate this is happening at a time when the wood production pressure on the native forest is

declining: Australia's forest timber industry is changing from reliance on hardwood to reliance on softwood. Nevertheless, there will be a continuing demand for hardwood where attributes of strength, durability and attractiveness are important to consumers.

Nature conservation

Prior to the 1990s the goal of conserving native flora and fauna, historical sites, landscapes and landforms was pursued primarily through dedication of national parks under the direction and management of the NSW National Parks and Wildlife Service. National parks were generally small, isolated, and dominated by vegetation communities of little or no commercial value. They were also managed primarily for recreation, leading to some conflict with nature conservation objectives. The most important areas of biodiversity in the State are retained natural forest in State Forests and forests on private land. With the exception of some State environmental planning policies that protected wetlands and littoral (coastal) rainforest, there was little formal protection of extensive habitats outside national parks and reserves, often referred to as 'off-reserve' habitats. Historically, most decisions on the role of State forests were made by governments in order to sustain wood supply to industry, to maintain rural employment, to prevent an explosion of wood imports, and to limit increases in the price of timber. Largely because of this, a substantial part of the public forest resource was allocated to wood production, creating, by present-day standards, an imbalance between the production and conservation functions of the forests. It was accepted during the immediate postwar decades that as little as 5 per cent of the forest constituted an adequate national park estate.

The implementation of periodic State-wide reviews of public land use provides a mechanism for resolving imbalances in public land allocation. Victoria in 1970 and Western Australia in 1974 were the first States to undertake comprehensive public land use reviews for reallocation of public forests to nature reserves. No equivalent reviews took place in New South Wales but significant transfer of rainforest from State forest to national park occurred later, in the 1980s. This left a national park network where rainforest and semi-arid lands and scrubs were over-represented, and the high-quality, commercially valuable forests of the tablelands, slopes and coastal lowlands were under-represented. The current process leading to

formal agreements over forest use is the first objective assessment of land allocation for conservation purposes in New South Wales.

Australia's National Forest Policy seeks to achieve conservation targets through a combination of reservation and complementary multiple use management in off-reserve wood production forests. No serious consideration was given to off-reserve conservation in public and private forests in New South Wales prior to the 1990s because existing legislation did not provide adequate protection for off-reserve wildlife habitat. A licence was required from National Parks and Wildlife Service under the *National Parks and Wildlife Act 1974* for the direct taking or killing of wildlife (for example, for trade or research) but no licence was required for the indirect taking or killing of wildlife by destruction of habitat (for example, through clearing or forestry) on public or private land. Environmental impact statements were required for major developments but approval authorities had little power to enforce the principles and practices associated with ecologically sustainable forest management and there were no codes of practice or conservation protocols for protection of biodiversity values in State forests.

This situation changed suddenly in 1991 when the Land and Environment Court ruled that forestry activities that modified wildlife habitat in Chaelundi State Forest would result in the taking or killing of endangered species and therefore required a licence under the National Parks and Wildlife Act. This ruling empowered the National Parks and Wildlife Service to impose conditions on forestry practices to ameliorate impacts on threatened fauna. These powers were re-enforced by the introduction of the *Endangered Fauna Interim Protection Act 1992*, which required the preparation of fauna impact statements approved by the National Parks and Wildlife Service for all activities on private and public land likely to have a significant adverse effect on the habitats of vulnerable and endangered fauna. Assessment criteria known as the '7 point test' were specified in the Act for the purpose of determining when a development was likely to have a significant impact and require a fauna impact statement.

The Endangered Fauna Interim Protection Act was replaced in 1995 by the Threatened Species Conservation Act, which extended the list of threatened species to include flora, ecological communities and individual threatened populations (including invertebrates) in addition to fauna, and made a number of other changes

including the listing of threatening processes and a requirement to prepare threat abatement plans, threatened species' recovery plans, and property management plans for land use activities that required a licence. The Threatened Species Conservation Act also introduced a new '8 point test' of significance for determining when a species impact statement must be prepared and submitted to the Director General of the National Parks and Wildlife Service for approval (concurrence) or advice.

The Threatened Species Conservation Act is the most comprehensive and effective legislation for vegetation and habitat protection in Australia. It is the most important Act regulating vegetation clearing and modification on all tenures in New South Wales. Since some species listed as threatened under the Act are widely distributed in the State and, in the case of species such as bats, can occur in significant numbers in a single large old tree, clearing or modification (for example, by forestry) of almost any patch of remnant natural forest requires a fauna or fauna habitat survey and assessment under the '8 point' test. The National Parks and Wildlife Service considers the Act currently represents the most appropriate legislative response to the challenges of biodiversity conservation.

The *Threatened Species Conservation Act 1995* includes amongst its objects:

- the promotion of ecologically sustainable development;
- the elimination or management of threatening processes;
- the proper assessment of any impacts affecting threatened species, populations and communities; and
- the encouragement of co-operative management for conservation of threatened species.

These objects and the mechanisms of the Act provide scope for ecologically sustainable forest management on forests in both private and public tenures, yet achievement of such management has been far from consistent and effective. Information required for cost-effective delivery of ecologically sustainable forest management is being withheld by government agencies, there are inconsistencies and loopholes in impact assessment procedures, standard measures for elimination and management of threats (codes of practice) have not been developed for most activities on private land, and protection of

threatened species cannot be guaranteed on public lands, including national parks. Rectification of these deficiencies requires little modification of existing legislation but major changes in policies, planning processes, practices and commitment of government agencies.

Because off-reserve wildlife habitat protection legislation in New South Wales is relatively new and is not yet fully backed by a history of effective implementation and enforcement, the conservation community distrusts the ability of off-reserve management to achieve sustainable forest management over the long term. This uncertainty has fostered a single strategy approach to conservation based on accumulation of as much area as possible in national parks. This approach fails to recognise the important role played by multiple use forestry in protecting biodiversity in New South Wales forests. In the post-regional forest agreement environment, the most extensive areas of wildlife habitat will still occur off-reserve in State forests and retained vegetation on private land. The future of biodiversity under this new arrangement will remain dependent on ecologically sustainable management of the off-reserve estate. As New South Wales has the most effective off-reserve wildlife habitat protection legislation in Australia, the State has an opportunity to lead the way in restoring public confidence in ecologically sustainable approaches to biodiversity conservation off-reserve.

INTERPRETATION OF ECOLOGICALLY SUSTAINABLE FOREST MANAGEMENT

The assessment focused on the ability of management systems and processes to achieve ecologically sustainable forest management, but not on the detail of management practices pertaining to systems and processes. The expert working group has interpreted the five ecologically sustainable forest management principles contained in its Terms of Reference in the following manner for the purpose of assessing forest management systems and processes in New South Wales:

Principle 1: Maintain or increase the full suite of forest values for present and future generations across the New South Wales forest estate

(Principle 1 has seven parts)

A Biodiversity

This aspect of the principle is taken to mean that biodiversity values in forests (at community, species, population and genetic levels) will be maintained above minimum target levels at State-wide and regional scales. This goal will be achieved by a combination of strategies: forest reservation, off-reserve multiple use management, maintenance of wildlife corridors and links, and control of processes that threaten biodiversity.

Reservation will be achieved through dedication of a comprehensive, adequate and representative (CAR) reserve system that includes national parks, reserves, and retained off-reserve areas on other public and private lands.

Off-reserve multiple use management will be achieved by bioregional planning which identifies the most appropriate use for the land and identifies codes of practice (conservation protocols) for specific landuses to ensure the maintenance of biodiversity values above target levels, which may be lower than in reserves.

Corridors and links will be maintained by regulation of clearing and development patterns; management of the forest matrix to facilitate animal movement and dispersal between formal parks and reserves; and by protection and restoration of designated habitat corridors.

Control of threatening processes will be achieved by improved resourcing for development and implementation of State-wide threat abatement plans and recovery plans for groups of rare and endangered species affected by threatening processes common to them all. Rare and endangered species that are not adequately protected in reserves or by threat abatement plans will be managed under individual species recovery plans.

B Productive capacity and sustainability of forest ecosystems

This component of the principle requires a commitment to maintaining or increasing the productivity (biomass production) of forests, and to ensuring that the yield of forest products is sustainable. Ecologically sustainable practice is taken to mean that adequate account is taken of ecosystem processes, natural species and community patterns and silvicultural principles when formulating management practices in order that both wood production and a wide range of environmental values are maintained. While requirements for the sustainable management of non-wood values are also dealt with under other

parts of Principle 1, these values should be considered in an integrated way when formulating silvicultural practice for wood production.

C Forest ecosystem health and vitality

This component of the principle encompasses the concept of ecological integrity, and threats to it from changing environmental conditions. It places constraints on the type and acceptable level of disturbance to forest ecosystems. It requires an appreciation of that point beyond which disturbance to a forest ecosystem may begin to adversely affect forest health, vitality and productivity. Applying this part of the principle requires that site attributes, natural species mixtures and stand structures, and the effects of management activities are fully considered.

Threats to ecosystems from pests and diseases often result from an imbalance between species and community patterns and stand structures, and site resources. Achieving ecologically sustainable forest management may depend on restoring this balance.

D Conservation of soil and water resources

This aspect of the principle is taken to mean that effective management actions will be taken to protect soil and water values. These actions will involve assessment of inherent risk, implementation of mitigation practices (these will vary from site to site), and maintaining soil and water values by monitoring against agreed standards. Soil and water values generally need to be protected at the catchment, sub-catchment and local scale.

E Positive contribution to global geochemical cycles

The expert working group has restricted its interpretation of this principle to carbon cycles, because forest management can significantly affect carbon release to the atmosphere and take-up from it. The expert working group accepts that forests make a beneficial contribution to global carbon cycles when managed in an ecologically sustainable way. The appropriate scale of interpretation is the region, not the individual logging unit.

F Long-term social and economic benefits

The basis of this component is the promotion of forest-related economic activity that is consistent with the maintenance of environmental values. This goal is consistent with the National Forest Policy Statement. Forests as a whole need to be

managed so as to maximise the long-term welfare of, or benefit to society, in terms of the goods and services it requires from forests. The forest economy covers timber, other forest products and uses, such as water supply, mining, grazing, recreation and tourism.

G 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 value. Ecologically sustainable forest management must include processes to identify, evaluate, and protect these values.

Principle 2: Ensure public participation, access to information, accountability and transparency in the achievement of ecologically sustainable forest management

This principle is interpreted as a requirement that public participation will take place at strategic planning levels and other critical stages in the decision-making process. Proactive contribution to policy-setting processes should be encouraged; adequate information should be provided to all stakeholders; processes should be assessed for transparency, openness and accountability; and any deficiencies identified, reviewed and resolved by consensus. To demonstrate this principle has been met, key processes and outcomes should be well documented in a form readily understood by the interested public.

Principle 3: Ensure legislation, policies, institutional frameworks, codes, standards and practices achieve ecologically sustainable management of the native forest estate through requirements and/or by providing incentives

Principle 3 will be achieved largely through compliance with Principle 1. Principle 3 recognises that ecologically sustainable forest management cannot be achieved purely through regulation, but only by developing an appropriate balance between incentives and regulation.

Principle 4: Apply the precautionary principle for prevention of environmental degradation

The expert working group accepts that lack of full scientific certainty about the prospect of

environmental degradation should not be used as a reason for postponing measures to prevent the degradation. Given the complex patterns of species and communities within many native forests, and the sensitive relationships between forest communities and the environment, careful application of the precautionary principle will be essential to avoid environmental damage. Ecologically sustainable forest management cannot be achieved by relying on project-based assessment. For the precautionary principle to be implemented effectively the expert working group considers a shift to bioregional planning to be essential.

Careful evaluation of a proposed activity is needed in order to avoid, wherever practicable, serious or irreversible damage to the environment—backed up by risk-weighted assessments of management options linked with ‘best practice’ activities.

Principle 5: Apply best available knowledge and adaptive management processes

This principle requires that all forest and regulatory agencies make an active effort to apply relevant knowledge generated both from within and external to forest management agencies. Adaptive management requires setting targets for ecologically sustainable forest management values during the planning process, and monitoring to check whether targets are achieved. Appropriate review and improvement processes are required so that changes to forest management can be implemented when required. Strategic and tactical research and development programs are essential to underpin better forest management.

THE IMPORTANCE OF SCALE ISSUES AND TRADE-OFFS AMONG FOREST VALUES

It is clear that there is no simple or precise definition of ecologically sustainable forest management. The principles proposed address the components of ecologically sustainable forest management (or forest values) seen as important to society. However, the relative weighting given to the values, and the quantity of each desired will vary locally, and thus must relate to an agreed management goal for a particular area of forest. Emphasis will vary from conservation, through multiple use, to intensive wood production (for example, plantation forestry).

Forest values vary in both space (for example, with environmental conditions) and time (for example, during forest succession after disturbance and as forests’ age). This is true for both protected natural forests and those that are managed for timber production. It follows that not all parts of the forest can contribute equally to all forest values, and that any patch might well make different contributions at different points in time. Management plans must reflect these aspects of forest life and address ecologically sustainable forest management at appropriate scales. For example, soil and water values and endangered species need to be protected at the local (site) level, but most biodiversity goals (targets) will be achieved at larger scales that encompass both reserves and wood production forests. Wood production goals will also be set at larger scales, with some patches of forest making no contribution and others making a large contribution. This is effectively a zoning of forest use to meet agreed objectives.

Clearly, it is unrealistic to expect particular patches of forest to provide the same level of all forest values when they are managed for different purposes. The community must decide what levels and mix of environmental, social and economic values provide an acceptable balance for ecologically sustainable forest management. However, the expert working group stresses that setting targets for ecologically sustainable forest management should not be based solely on stakeholder consensus, because this can fail to adequately consider the scientific requirements for maintaining some values (for example, viability of species populations, sustainable wood supply). The selected mix of values must accept some loss of habitat on the one hand, and potential wood production on the other. A key issue is that of irreversible change (for example, species extinction, severe soil erosion). Where this is judged to be a real threat, a highly precautionary approach to forest management must be adopted.

LEGISLATION, POLICY AND COMMITMENT

THE STRUCTURE OF LEGISLATION RELATING TO NEW SOUTH WALES FORESTS: THE NEED FOR REFORM

This chapter reviews the existing legislative framework and institutional structure applying within New South Wales, examines the State's current forest-related policies, and makes recommendations for more appropriate institutions and mechanisms for achieving ecologically sustainable forest management.

INTERNATIONAL TREATIES, CONVENTIONS AND INITIATIVES

Australia is party to a number of international conventions that have a bearing on forest management. These include:

- United Nations Convention on Climate Change
- United Nations Convention on Biological Diversity
- UNESCO Convention for the Protection of the World Cultural and Natural Heritage (World Heritage Convention)
- Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention)
- China-Australia Migratory Bird and Japan-Australia Migratory Bird Agreements (CAMBA and JAMBA)
- Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention)
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)
- Convention on Conservation of Nature in the South Pacific (Apia Convention)

- Convention Concerning the Protection of the Natural Resources and the Environment of the South Pacific Region (SPREP Convention).

Although these conventions are binding on Australia under international law, the obligations which they contain are frequently such that they allow the Commonwealth Government considerable flexibility when it comes to their implementation. A significant exception to this is CITES, which contains very precise obligations relating to international trade in relation to species listed in the convention.

Implementing international conventions does not necessarily require legislation. Where legislation is required, it may be that current legislation, both Commonwealth and State, is considered sufficient to meet Australia's obligations.

In the past, conventions dealing with nature conservation issues have tended to focus on the conservation of particular species (for example, waterfowl, migratory birds) and areas of special conservation significance. There has been a considerable emphasis on setting aside areas as icons, neglecting the management across the whole landscape, which is increasingly seen as necessary for conservation of biological diversity. A focus on particular species, such as waterfowl in wetlands, may produce distortions in terms of the ecological character of particular wetlands.

The *World Heritage Convention* obliges Australia to identify and delineate properties in its territory which fall within the convention's definition of 'natural heritage'. The Commonwealth has a duty to do all it can, 'to the utmost of its own resources' to ensure the identification, protection, conservation, presentation and transmission to future generations of this heritage. Listing under two of the categories of natural heritage can be justified in terms of being outstanding aesthetically, regardless of whether or not the

property has significance in terms of conservation of representative biodiversity.

Under the Ramsar Convention, each party is required to 'designate suitable wetlands within its territory for inclusion in a List of Wetlands of International Importance', nominating at least one at the time of signing, ratifying or acceding to the convention. Unlike under the World Heritage Convention, there is no provision for vetting of nominated areas by an international body prior to listing. In terms of management, each party has an obligation to 'promote the conservation' of listed wetlands, but, in addition, there is a broad obligation to promote, as far as possible, the 'wise use' of wetlands generally. By obliging parties to promote the 'wise use' of wetlands in general, the convention avoids the exclusive focus on the conservation of special areas associated with listing processes, which are found in the World Heritage Convention.

Unlike earlier conventions, the in-situ conservation provisions of the *United Nations Convention on Biological Diversity* do not focus on the conservation of special areas or special species. While parties are required 'as far as possible and appropriate...[to] establish a system of protected areas or areas where special measures need to be taken to conserve biological diversity', a protected area is defined simply as 'a geographically defined area which is designated or regulated and managed to achieve specific conservation objectives.' There is also a commitment to promote buffer zones adjacent to protected areas, where development is 'environmentally sound and sustainable.'

While parties are required to legislate/regulate for the protection of threatened species, they must also:

- cover threatened populations of species (that is, protect genetic diversity within species),
- 'promote the protection of ecosystems, natural habitats and the maintenance of viable populations of species in natural surroundings'
- 'regulate or manage biological resources important for the conservation of biological diversity *whether within or outside protected areas* with a view to ensuring their conservation and sustainable use' (emphasis supplied).
- identify and regulate or manage processes and activities which have significant adverse impacts on the conservation and sustainable use of biological diversity. The

control/eradication of introduced species is specifically mentioned, but this provision would include human activities such as the destruction of habitat by land clearing.

These commitments do not necessarily involve the use of regulatory measures. Article 11 of the convention provides that parties must:

as far as possible and as appropriate adopt economically and socially sound measures that act as incentives for the conservation and sustainable use of components of biological diversity.

A significant feature of the convention is its emphasis on both conservation and *sustainable use* of components of biological diversity. The objectives of the convention are:

the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding.

'Sustainable use' is defined to mean:

the use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations.

There are a number of other international initiatives which do not create legally binding obligations, but are very relevant to activities in forests. These include:

- The Rio Declaration and Agenda 21
- UNESCO's Man and the Biosphere Program
- The United Nations Commission for Sustainable Development
- The Montreal Process and the Santiago Declaration
- Intergovernmental Panel on Forests.

NATIONAL POLICY STATEMENTS

The National Forest Policy Statement (NFPS) (Commonwealth of Australia, 1992b) agreed between the Commonwealth, States and Territories was the starting point for the comprehensive regional assessment process leading to regional forest agreements. The policy

sets the broad framework for addressing the principles of ecologically sustainable forest management and builds on the National Strategy for Ecologically Sustainable Development.

The National Forest Policy Statement established 11 national goals to be 'pursued within a regionally based planning framework that integrates environmental and commercial objectives so that, as far as possible, provision is made for all forest values'. These broad national goals are:

- *Conservation*: 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';
- *Wood production and industry development*: 'to develop internationally competitive and ecologically sustainable wood production and wood products industries' which maximise value-adding opportunities and efficient use of wood resources;
- *Integrated and coordinated decision making and management*: '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';
- *Private native forests*: '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';
- *Plantations*: '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[and]increase plantings to rehabilitate cleared agricultural land, to improve water quality, and to meet other environmental, economic or aesthetic objectives';
- *Water supply and catchment management*. The goals are to ensure the availability of reliable, high-quality water from forested land and to protect catchment values;
- *Tourism and other economic and social opportunities*: 'to manage Australia's forests in

an ecologically sustainable manner for a range of uses, including tourism, recreation and production of non-wood products';

- *Employment, workforce education and training*: 'to expand employment opportunities and the skills base of people working in forest management and forest-based industries';
- *Public awareness, education and involvement*: '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';
- *Research and development*: 'to increase Australia's national forest research and development effort and to ensure that it is well coordinated, efficiently undertaken and effectively applied'; and
- *International responsibilities*: to promote nature conservation and sustainable use of forests outside Australia and to ensure that Australia fulfils its obligations under relevant international agreements.

Important elements of the above goals that were highlighted in the assessment of State legislation in relation to ecologically sustainable forest management principles in New South Wales include:

- planning on a regional basis: although there are movements in this direction, they are uncoordinated and potentially conflicting;
- integrated and coordinated decision making and management: this is a particular problem in New South Wales because a number of Government agencies are involved in forestry management and planning;
- managing private native forests in an ecologically sustainable manner: at present there are a number of regulatory regimes in New South Wales concerned with the protection of private forests, but no clear commitment to managing private forests in an ecologically sustainable way;
- public participation in decision-making processes.

The National Strategy for the Conservation of Australia's Biological Diversity (Commonwealth of Australia 1996), another national level policy initiative agreed by the Commonwealth and the States and Territories, is designed to go some way towards meeting Australia's obligations under the

international convention on biological diversity. This national strategy is the core policy underpinning part A of the first NSW ecologically sustainable forest management principle (see Chapter 1). The Draft NSW Biodiversity Strategy (1997) complements the national strategy, and is based on similar principles.

The goal of the national strategy for biodiversity is to 'protect biological diversity and maintain ecological processes and systems'.

The content of the national strategy relevant to part A of the first NSW ecologically sustainable forest management principle includes:

- biological diversity is best conserved in-situ;
- central to the conservation of biodiversity is the establishment of a comprehensive, adequate and representative (CAR) system of ecologically viable protected areas integrated with the sympathetic management of all other areas, including agricultural and other resource production systems. The reserve system is to be established over a period of ten years.

The national strategy for biodiversity requires that planning must be carried out on a bioregional basis using natural boundaries such as vegetation types, catchments and climatic factors. The draft State strategy identifies as a priority to be completed by 2000, the need to:

Develop and promote a model bioregional planning framework and process which identifies and develops mechanisms between all spheres of government, including Local Government, to ensure cooperative and coordinated land use planning involving full and continued community participation

The expert working group considers that ecological sustainability must be considered on a regional basis through a planning mechanism, with decisions on individual applications having to comply with the plan. In other words, economic benefits can only be pursued within the constraints of ecological sustainability at a regional level.

The commitment by the Commonwealth and State Governments to set up a comprehensive, adequate and representative reserve system was first made in the National Forest Policy Statement. It was repeated in the National Strategy for the Conservation of Australia's Biological Diversity. The Draft NSW Biodiversity Strategy commits the State Government to having such a system of reserved forest in place by 2000. It defines the

three principles involved in the so-called CAR reserve system in the following way:

- *comprehensiveness* - the degree to which the reserve system encompasses the full range of biological/biophysical diversity and other values;
- *adequacy* - the capability of the reserve system to maintain biodiversity and ecological patterns and processes and other values, given both natural and human-influenced disturbances; and
- *representativeness* - the extent to which the areas selected for inclusion in the reserve system sample known biological/biophysical diversity and other values.

The CAR reserve system is to be based on a precautionary 'general criterion' of reserving 15 per cent of the distribution of each forest ecosystem as it existed in 1750. This benchmark was set by JANIS, the committee established to oversee the implementation of the national forest policy (from Joint ANZECC-MCFFA National Forest Policy Statement Implementation Subcommittee). The notion of a reserve system is broadly conceived and the intention is to include privately owned land to ensure that the full range of forest ecosystems is represented. There is also a commitment to complementary off-reserve management (that is, management of native forests outside the formal protection of national parks and reserves).

An ongoing study of conservation reserves in north-eastern New South Wales has found that protected areas comprise the least desirable land, that is, land that is often steep and infertile and 'with the least potential for grazing, cropping or urban developments'.

Strict reservation in the region is based largely on the distribution of Crown land which has been an inexpensive source of land for reserves. Crown land is generally the land that remained after the parts of the region with the most promise for commercial uses were converted to freehold ... Within Crown land there is a tendency for reserves to be concentrated in areas with least potential for commercial logging. Reservation can therefore be regarded as a residual land use within a residual tenure. (Pressey *et al.* 1996).

These results emphasise the need for governments to devise appropriate policy instruments to allow the incorporation of areas of private land within

the CAR reserve system and to provide for off-reserve management.

COMMONWEALTH LEGISLATION

Commonwealth law relevant to ecologically sustainable forest management in New South Wales is largely based on regulations made under the *Export Control Act 1982*. Under the regulations, prospective exporters must obtain a licence from the Minister for Primary Industries and Energy to export woodchips or unprocessed wood. The Export Control (Hardwood Wood Chips) (1996) Regulations govern export of hardwood chips derived from native forests, and the Export Control (Unprocessed Wood) Regulations cover unprocessed wood generally, and woodchips derived from other than native forests.

In the case of applications for a transitional licence to export hardwood chips derived from native forests, the export control regulations require the Minister to consider the need to protect areas that may be needed to establish a comprehensive, adequate and representative reserve system, the economic and social effects of the decision, and the applicant's ability to export material (financial resources available to the applicant, access to port facilities, and ability to market the material).

The export control regulations also impose a national annual aggregate ceiling on hardwood chip exports from native forests under transitional licences and prohibit their export from 1 January 2000 unless they are derived from an area covered by a regional forest agreement.

The need to obtain an export licence triggers the operation of other Commonwealth legislation under which significant environmental assessment obligations are imposed on those wishing to export unprocessed wood. *The Environment Protection (Impact of Proposals) Act 1974* requires the Minister for Primary Industries and Energy to refer environmentally significant activities to the Minister for the Environment for decision as to whether an environmental impact statement, a public environment report or an inquiry should be ordered.

The *Australian Heritage Commission Act 1975* provides some protection for places listed on the Register of the National Estate. All Commonwealth Ministers have a duty to ensure they do not make decisions that adversely affect a place or building on the Register of the National

Estate or the Interim List unless they are satisfied that there is no 'feasible and prudent alternative'. In the event that there is no such alternative, all reasonable measures must be taken to minimise environmental damage. Advice must be requested from the Australian Heritage Commission in regard to all proposed Commonwealth actions likely to have a significant effect (whether or not adverse) on any listed place or building. Thus if the Minister for Primary Industries and Energy considers that the granting of an export licence might significantly affect a place on the Register (or Interim List) of the National Estate, the Minister is required to seek advice from the Commission.

These legislative instruments have a limited and arbitrary hold over activity in forests. They are only triggered by proposed Commonwealth decisions or actions, not those of State agencies or private industry. For example, where an export licence is not required because the timber in question is not to be exported, the Commonwealth environmental assessment provisions do not apply. In addition, these provisions are only triggered by the export of the commodity and not the initial activity (that is, the logging operation) which produces it.

Consequently, the Commonwealth Government introduced the Export Control (Regional Forest Agreements) Regulations in 1997. This legislation effectively removes export controls from all unprocessed wood and woodchips derived from native forests in regions covered by regional forest agreements (plantation-sourced material is subject to a separate export control removal process on a State-wide basis). As a result, the export licence 'trigger' (that is, licence applications) for Commonwealth environmental assessment will no longer apply to forestry export operations unless some other Commonwealth approval is required.

The *Wildlife Protection (Regulation of Exports and Imports) Act 1982* will continue to play a role in conserving biodiversity by regulating the export of species.

Other relevant Commonwealth legislation applies only to selected areas. *The World Heritage Properties Conservation Act 1983* protects areas identified as being of world heritage significance from immediate threat. It offers little in terms of ongoing management. Similarly, the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* applies to areas of 'particular

significance to Aboriginals in accordance with Aboriginal tradition’.

The *Endangered Species Protection Act 1992* plays a peripheral role in the States as it applies only to Commonwealth land. This includes areas of high biodiversity and heritage significance owned by the Department of Defence (for example, Holdsworthy army base). However, should a listed species occur on privately owned land or State Crown land in addition to Commonwealth land, the Commonwealth’s only obligation under the Act is to ‘seek the cooperation’ of the relevant State with a view to the joint preparation and implementation of a recovery plan or threat abatement plan. If the species in question is found only outside Commonwealth land, the Commonwealth Minister for the Environment can offer financial assistance for the preparation of these plans. No obligations are placed on Commonwealth agencies in their activities and decision-making outside Commonwealth areas unless the State has a threat abatement plan in place. To the extent that it is not bound by the provisions of the New South Wales law relating to endangered species, the only obligation which the Commonwealth endangered species legislation places on Ministers is to ‘have regard to the desirability of complying’ with the requirements of the State legislation.

INTRODUCTION TO NSW LAW

New South Wales legislation relating to forests is a complex mixture of ancient and modern. It contains some of the most innovative and exciting techniques currently available to law as an instrument of social policy, but these must coexist with crude and clumsy mechanisms from a time long past, which have little to do with modern ideas about natural resource management. For the most part, the new breed of holistic ‘environmental law’, such as the *Environmental Planning and Assessment Act 1979*, has been simply superimposed on outdated sectoral and segmented natural resources law which had its origins in a period of resource development rather than environmental management.

In some contexts, there is little relationship between law, on the one hand, and current policy and planning processes, on the other. Policy and planning processes may simply bypass the law. This is very much the position in relation to water resources policy and management and the *Water Act 1912*, for example. While there have been dramatic changes in the level of water planning

and management in recent years, these have largely taken place within the existing legal framework. So far as the law is concerned, the approach of government in recent years has been to deal with specific problems as and when they have arisen by ad hoc amendments, rather than carrying out a fundamental re-examination of the legislation. The result is that the Water Act is a patchwork quilt of unclear and potentially conflicting provisions, quite inaccessible to the broader community.

In other contexts, where fundamental reconsideration of legislation has taken place, this appears to have been carried out by particular agencies in relative isolation in a segmented fashion. The recent New South Wales initiatives in the fields of pollution control and environmental planning are a case in point: at one stage, there were two different versions of a proposed integrated approvals process in two different pieces of draft legislation.

Production forests on public land

The primary legislation relating to forests as a resource was first enacted over 80 years ago. The *Forestry Act 1916* still plays an essential role in relation to forest management on land in public ownership, although it has been subject to several major amendments and incremental additions.

Section 8A(1) of the Forestry Act sets out the objects of the Forestry Commission (now State Forests of NSW). After spelling out those objects relating to the conservation and utilisation of the timber resource, it provides that, consistent with the use of State forests for the purposes of forestry and of flora reserves for the preservation of the native flora, State Forests will :

- promote and encourage the use of forests or recreation; and
- conserve forest birds and animals.

There is no clear commitment in the legislation to conserve biological diversity in production forests. The requirement that conservation of birds and animals should be ‘consistent with’ timber production suggests that the latter is to take priority. This is not clarified by section 8A(2), which simply provides that State Forests must take ‘all practicable steps that *it considers necessary or desirable* to ensure the preservation and enhancement of the quality of the environment’ (emphasis supplied).

After 1979, the body administering the Forestry Act also had to comply with the environmental assessment provisions of the Environmental Planning and Assessment Act, including the preparation of an environmental impact statement where there was likely to be a significant effect on the environment.

History shows that State Forests felt no ownership of this legislation and had significant problems in grappling with the implications of its provisions for public forestry operations. This led to further statutory intervention in the form of the *Timber Industry (Interim Protection) Act 1992*. This legislation was an ad hoc response to the difficulties faced by State Forests and the timber industry as a result of judicial decisions which made it clear that the environmental impact assessment responsibilities of State Forests under Part 5 of the Environmental Planning and Assessment Act were much greater than State Forests had previously believed.

One of the stated objects of the Timber Industry (Interim Protection) Act was to protect the employment of timber industry workers. To this end, the legislation suspended the operation of Part 5 of the Environmental Planning and Assessment Act in a number of forest management areas so as to allow logging to continue. At the same time, under the legislation, a timetable was set for the completion of environment impact statements where these were required under the Environmental Planning and Assessment Act. These are still to be finalised. In the interim, the logging operation is being supervised by the Regulatory and Public Information Committee, comprising representatives from the National Parks and Wildlife Service, the Environment Protection Agency, the Department of Land and Water Conservation and State Forests. The latter must submit proposed logging and roading plans to the committee for its scrutiny before they may be adopted. In areas of old-growth and potential wilderness, as identified in Schedules 1 and 2 of the Timber Industry (Interim Protection) Act, Part 5 was not suspended and had to be complied with prior to logging operations.

The expiry date of the Timber Industry (Interim Protection) Act has been put back on a number of occasions and is currently 1998. The continued exemption of State Forests from requirements to undertake environmental impact statements is inconsistent with the delivery of ecologically sustainable forest management, in particular, the precautionary principle. The expert working

group's position on environmental impact statements is contained in Chapter 3.

In 1993 the Minister for Urban Affairs and Planning was given the power to veto the proposals of State Forests and other agencies, in situations where an environmental impact statement has been required under the Environmental Planning and Assessment Act.

The Environment Protection Authority has also begun to licence harvesting activities authorised by State Forests where there is a threat of water pollution, under the provisions of the *Clean Waters Act 1970* and the *Pollution Control Act 1970* (see now the *Protection of the Environment Operations Act 1997*, not yet in force).

More recently, yet another tier has been added to this process of incremental overlay. The provisions of the *Threatened Species Conservation Act 1995* now require a species impact statement to be considered in situations where a proposal is likely to significantly affect threatened species, etc. In these circumstances, the concurrence of the Director-General of National Parks and Wildlife must be obtained before a proposal can be approved.

On top of the confusion and uncertainty resulting from this process of incremental legal change, the legislative responsibilities imposed on government agencies are frequently so broad that the agencies do not have the resources to implement them. The result is that, in many instances, legislative requirements are no more than symbolic. They may satisfy short-term political imperatives, but in practice they leave agencies with substantial discretion in choosing the areas to which they will allocate resources. In the case of State Forests, legal proceedings brought by conservation groups, and subsequent legislation in the form of the Timber Industry (Interim Protection) Act deprived the agency of this discretion. The result was that limited resources were deflected from the process of *strategic* planning into the process of environmental impact assessment, in particular, preparation of environmental impact statements, which were originally designed by the legislation as *operational* instruments.

Conservation areas

Legislation designed to conserve non-production forests is another complex situation. Even though the *National Parks and Wildlife Act 1974* is more recent than the forestry legislation, it does not set

out the objects of the legislation or the objects of the National Parks and Wildlife Service. There is no mention of the concept of biological diversity in the legislation and no commitment that corresponds to that of the National Forest Policy Statement for a comprehensive, adequate and representative reserve system. It is clear that areas currently reserved or dedicated under the Act fall far short of meeting this objective.

There is no clear conception of a national park. National parks are simply 'spacious areas containing unique or outstanding scenery or natural phenomena'. There is a significant emphasis on public enjoyment in the concept of national parks and wilderness areas, with no clear priorities identified in relation to biodiversity conservation. One of the objectives of a management plan for a national park is the encouragement and regulation of the appropriate use, understanding and enjoyment of each national park by the public. The provisions allowing leases to be granted in national parks reflect a recreational/tourism emphasis. Permitted purposes include the erection of hotels and guest houses. Wilderness areas must be 'capable of providing opportunities for solitude and appropriate self-reliant recreation'.

Nature reserves are dedicated for the purposes of:

- the care, propagation, preservation and conservation of wildlife;
- the care, preservation and conservation of natural environments and natural phenomena;
- the study of wildlife, natural environments and natural phenomena; and
- the promotion of the appreciation and enjoyment of wildlife, natural environments and natural phenomena.

'Wildlife' is defined narrowly in the legislation to include only mammals, birds, reptiles, amphibians and plants, thus excluding consideration of significant elements of biological diversity even in relation to nature reserves. The notion of 'propagating' wildlife in nature reserves is quite out of touch with current notions of biodiversity conservation.

Recommendation 2.1: The legislation setting up the National Parks and Wildlife Service as manager of conservation areas in public ownership, and State Forests as manager of production forests in public ownership, should be amended so as to clearly identify the objectives of these agencies and the areas

which they manage in terms of the demands of ecologically sustainable forest management. In particular, it should be made clear that the provision of recreational opportunities in land ear-marked as being required for the proposed comprehensive, adequate and representative (CAR) forest reserve system should be subservient to the conservation of biological diversity.

Off-reserve conservation

Following the enactment of the *Native Vegetation Conservation Act 1997*, which came into operation at the beginning of 1998, the position with regard to off-reserve conservation on areas of private land has been simplified and rationalised. Provisions regulating the removal of native vegetation previously found in the *Soil Conservation Act 1938* (protected lands), the *Western Lands Act 1901* (the Western Division) and State Environmental Planning Policy 46 (SEPP 46) have been repealed and replaced by a single system set up by the new legislation and administered by the Department of Land and Water Conservation. Both 'clearing' and 'native vegetation' are broadly defined. Groundcover and understorey plants are included along with trees. The notion of 'protected land' is retained under the new legislation, and in these areas even non-indigenous trees are protected.

The general position under the Native Vegetation Conservation Act is that, subject to certain exemptions, development consent under Part 4 of the Environmental Planning and Assessment Act is required for vegetation clearance on privately owned and Crown leasehold land.

There is a general exemption for clearing in accordance with any native vegetation code of practice that is in force under the provisions of the Act, but this exemption does not apply to land that has been mapped as State protected land (steeply sloping land, the banks of watercourses and land which is environmentally sensitive or subject to land degradation).

These are interim arrangements. The legislation goes on to provide for Regional Vegetation Committees or for the Director-General of the Department of Land and Water Conservation to develop regional vegetation management plans which, once approved by the Minister, will indicate areas where clearing consent is required and areas where it is not.

The Minister for Land and Water Conservation is responsible for deciding whether or not to grant

consent. A register of consents granted must be made available for public inspection.

In spite of this significant rationalisation, provisions concerning vegetation conservation in other legislation have survived the amendments and will continue to be available to other government agencies. Interim and permanent conservation orders can be made by the Minister for Urban Affairs and Planning under the *Heritage Act 1977* to protect places of scientific, natural or aesthetic significance. Under the *National Parks and Wildlife Act 1974*, the Minister for the Environment can issue interim protection orders in respect of any land of natural or scientific significance, providing for the 'preservation, protection and maintenance' of the area concerned, its fauna and plants. However, interim protection orders last only up to two years, and there is no equivalent in the National Parks and Wildlife Act of the *permanent* conservation order provided for in the Heritage Act. The National Parks and Wildlife Act envisages that long-term conservation will be achieved through voluntary conservation agreements rather than regulation.

Under State Environmental Planning Policies 14 and 26, local councils and the Department of Urban Affairs and Planning will continue to regulate the clearing of mapped areas of coastal wetland and littoral (coastal) rainforest. There are also conservation provisions under many local environmental plans, such as environmental protection zones and clearing consent requirements.

The new legislation provides that where local environmental plans adequately provide for the conservation and management of native vegetation in a local government area, consistent with the objectives of the Native Vegetation Management Act, then the Minister may exempt the area from some or all of the provisions of the Act. If a local government area has not been exempted, then the provisions of the Native Vegetation Management Act and regional vegetation management plans override the provisions of local environment plans, and the powers of local councils. However, as regional vegetation management plans are developed, the legislation requires them to provide for at least the same level of vegetation protection and conservation as that provided for in existing local environmental plans.

The threatened species overlay

The provisions of the *Threatened Species Conservation Act 1995* now require a species impact statement to be considered in situations where forestry activity in State forests or a proposal to clear native vegetation under the Native Vegetation Conservation Act are likely to significantly affect a threatened species, population or ecological community, or its habitat. In addition, the concurrence of the Director-General of National Parks and Wildlife has to be obtained before the final go-ahead can be given for activities in State forests.

Where an activity with the potential to damage the habitat of threatened species is not regulated under any other regulatory system (for example, bush-rock removal on private land, assuming that this is not to be treated as a routine *agricultural* activity), it may require a licence directly from the National Parks and Wildlife Service. In these circumstances, once again a species impact statement will be required where the proposal is likely to significantly affect threatened species.

An 8 point test for determining whether there is likely to be a significant effect is set out in the legislation.

Reforming institutional arrangements and legislation

State laws relating both to production forests and the management of forested areas for conservation purposes can only be understood in terms of their gradual evolution. This has seen layer built upon existing layer, with no attempt to conduct any fundamental re-evaluation. This situation makes for an extremely complex system of legislative control—one which is certainly not transparent to the agencies responsible for administering the regulations. The expert working group found examples of situations where government agencies were not fully aware of their potential responsibilities or were reluctant to exercise their full range of powers.

Achieving ecologically sustainable forest management requires that management give consideration to a range of ecological, economic and social issues, and that there be an effective regulatory environment to ensure good management. Currently there is no clear locus of responsibility for forest management or regulation of forest activities. The expert working group believes that this situation needs to be addressed as a matter of urgency.

Management responsibility for forests on public land lies with State Forests, the National Parks and Wildlife Service and the Department of Land and Water Conservation. While the predecessors of the Department of Land and Water Conservation have managed residual Crown land for a wide range of purposes, including conservation and recreation, historically the National Parks and Wildlife Service and State Forests have been accorded distinctive roles. National Parks and Wildlife has managed forest reserved for nature conservation, and State Forests has managed forest committed to wood production, including commercial timber on residual Crown land. But State Forests has always had a subsidiary brief for conservation, and this is likely to become more prominent after regional forest agreements are negotiated. As a regulator, under threatened species legislation, of land under the jurisdiction of State Forests, the National Parks and Wildlife Service effectively already shares conservation management responsibility in these areas with State Forests. The nationally agreed criteria for a CAR forest reserve system (JANIS 1997) make it clear that the CAR reserve system will incorporate not only dedicated reserves but also informal reserves on public land 'under other secure tenure or management arrangements (for example, within approved forest management plans)'.

While the National Parks and Wildlife Service is the leading conservation agency in New South Wales, in practice it has found itself under increasing pressure to manage national parks for recreational purposes. State Forests also has a subsidiary brief for recreation.

The simple dichotomy between nature conservation/recreation and wood production is no longer appropriate. Public forested land is now best seen in terms of a management continuum: from nature reserves at one end of the spectrum, through forest managed jointly for nature conservation/recreation and wood production, to forest managed intensively for wood production. The message which comes strongly out of the JANIS reserve criteria is that natural resource management must occur at the 'landscape' level. No longer is it appropriate for national park or State forest management plans to stop at boundaries that have little to do with natural systems.

Management of private forests has been left to private landholders, with limited support from government. The expert working group found that little was known about the private forest estate,

including ownership patterns, the size of individual forest blocks, the productive condition of the forest, and likely log yields.

Turning from management to regulation, the principal objective is to ensure:

- agreed standards in relation to the protection of species—especially threatened species and communities—protection of soil and water values and forest production; and
- an agreed balance between conservation and productive/consumptive uses in the assessment of the allowable impact.

These regulatory responsibilities are currently shared by a number of agencies. State Forests is in fact regulated by four different regulators: the Environment Protection Authority, primarily concerned with water pollution, but flowing from this, an inevitable interest in soils; the National Parks and Wildlife Service, concerned with threatened species; the Minister for Urban Affairs and Planning, whose brief extends to all aspects of environmental impact, but is restricted to situations where an environmental impact statement has been prepared; and the Regulatory and Public Information Committee—comprising representatives from the National Parks and Wildlife Service, the Environment Protection Agency, the Soil Conservation Service and State Forests—which scrutinises proposed logging and roading plans in situations where environmental impact statements have not yet been completed.

The State Labor Government's forest policy (1995) provides for the appointment of a Principal Forest Regulator to monitor the implementation of forest management plans in forests controlled by State Forests.

On private land, there are even more agencies involved with regulation. Although the Department of Land and Water Conservation's role as lead agency in the field of vegetation conservation has been confirmed and rationalised by the Native Vegetation Conservation Act, its precise relationship with local councils operating under local environmental plans has yet to be worked out in practice. In addition, regulatory interventions can be made by both the Minister for Urban Affairs and Planning through special order under the Heritage Act, and by the Minister for the Environment through special order under the National Parks and Wildlife Act. The Environment Protection Authority has a regulatory brief where activities in forests are likely to result in water pollution.

The most significant problem with multiple regulatory authorities having overlapping jurisdictions is that there is no clear locus of responsibility for particular incidents so that enforcement action could be taken by any one of a number of agencies under a variety of different pieces of legislation. This is likely to lead to buck-passing.

Another tension arises in agencies, such as the National Parks and Wildlife Service and the Department of Land and Water Conservation, where an extension/educational role must coexist with a regulatory role. Regulatory responsibilities can lead to confrontation, which undermines the extension role. In the case of the National Parks and Wildlife Service, this tension could be leading to a reluctance to implement its regulatory responsibilities.

The extension/educational role should be seen as part of a private forest support function, which is an aspect of private forest management.

Improving forestry and conservation practices on private land will be a significant step towards achieving ecologically sustainable management in New South Wales' forests. This goal would be furthered by the creation of a technical and support service for private forest management to encourage improved forest practices, both in terms of production forestry and conservation management. Steps should be taken to separate existing forest regulatory and management functions and improve the cost-effectiveness of regulatory procedures.

The expert working group recognises there have been recent structural changes within the forest management system in New South Wales and that some time is needed for consolidation. Given this, recommendations 2.2 - 2.4 are made:

Recommendation 2.2: In the short term, an inter-agency coordinating group involving existing regulatory agencies should be established to:

- better coordinate planning in relation to cross-tenure issues;
- ensure consistency of plans with the regional forest agreement and other hierarchical components of the planning structure;
- coordinate the process of granting licences and approvals;
- coordinate independent audits of processes and outcomes;

- ensure better implementation and enforcement of regulations;
- improve response to public concerns about inadequate compliance with policies and codes; and
- effectively report to the public and government of the findings from audits.

However, even in the short term, it is essential that the following functions are managed and approved by a single agency:

- responsibility for ensuring that forests-related plans address management requirements for ecological sustainability and specify ecologically sustainable management targets (such plans include, for example, management area plans for public forests; regional vegetation and private forest management plans; and local and regional environmental plans);
- responsibility for establishing an effective code of forest practice system, including the approval of codes and methods for their implementation (see recommendation 3.18)
- responsibility for ensuring that monitoring (by the forest manager) of agreed ecologically sustainable forest management outcomes is conducted (see recommendation 6.1).

Within three years, the position of forest regulator should be established as a means of more effectively performing the above functions which are necessary for achieving ecologically sustainable forest management and to approve operations not adequately addressed by codes of practice or approved plans of management.

Recommendation 2.3: There is a need to strengthen cooperation and coordination between Government agencies so as to achieve integrated management for conservation, wood production and other values in both public and private forests. Specifically:

- active management across tenures of the comprehensive, adequate and representative (CAR) reserve system (formal and informal reserves and areas managed by prescription);
- complementary management of general wood production zones within State Forest;
- effective threat abatement practices;
- an appropriate balance between recreation and conservation;

- more effective management and use of resource information supporting ecologically sustainable forest
- more effective use of expertise;
- support for private native forest management;
- better strategic management area plans;
- better coordination of research and development;
- more effective communication of ecologically sustainable forest management outcomes.

In order to promote cultural change within existing forest agencies, the formation of an interdepartmental coordinating committee may provide some interim benefit. However, in the medium-term, a more effective option would be the formation of a Natural Resources Management Agency with management responsibility for all public forested land and a support function for managers of private forested land (see figure 1).

This recommendation is contingent upon the creation and filling of the position of forest regulator in order to assist in maintaining a balance between forest uses. The proposed natural resources agency will be guided in balancing conservation and wood production objectives by objectives specified in RFAs, requirements of the external regulator, and by other government policy.

A logical corollary of the proposals in Recommendations 2.2 and 2.3 will be to extend them so as to cover not only forests but all natural resources. However, this is outside the expert working group's terms of reference.

Recommendation 2.4: Private forest managers should be given assistance with the implementation of ecologically sustainable forest management , including:

- technical assistance in the preparation of conservation management plans, private forest management plans and individual timber harvesting plans;
- negotiation of conservation agreements; and
- the provision of advice and training in relation to codes of practice.

A Private Forest support Unit should be established to assist forest managers.

Using provisions of the EPA Act as an integrative mechanism

A process to develop legislation that will enable these proposed institutional arrangements to function more efficiently needs to be set in train. The expert working group recommends that a whole-of-government process to develop integrated natural resources legislation should be put in place. In the first place, however, the possibilities inherent in existing legislation with which the community and agencies are already familiar, should be explored.

The Environmental Planning and Assessment Act contains broad umbrella provisions that have the potential to address all elements of the first NSW principle for ecologically sustainable forest management.

Part 3 of the Act provides for the making of 'environmental planning instruments' such as—local and regional environmental plans and State environmental planning policies (SEPPs). Of these, regional environmental plans are potentially a vehicle for the bioregional planning envisaged in the National Forest Policy Statement, the National Strategy on the Conservation of Australia's Biological Diversity and the Draft NSW Biodiversity Strategy.

In the past, however, the main integrative mechanism has been Part 5 of the Act, which superimposed environmental assessment provisions on existing segmented, sectoral natural resources legislation. Although in recent years the Department of Urban Affairs and Planning has used Part 5 strategically, it was originally intended as little more than a mop-up provision designed to pick up and ensure the environmental assessment of projects which at that stage, for a variety of reasons, fell through the gaps of the development control provisions of Part 4 of the Act but required approval under other legislation.

As the possibilities inherent in the plan-making provisions of Part 3 and the regulatory provisions of Part 4 become increasingly apparent, and are used to manage and regulate projects, the role of Part 5 and the sectoral natural resources legislation to which it relates needs to be carefully scrutinised. Many activities covered by Part 5 could be brought within the ambit of Parts 3 and 4. This is in fact the approach which has been taken in the Native Vegetation Conservation Act.

Environmental planning instruments can be made under Part 3 'for the purposes of achieving any of

the objects' of the Act. The objects are found in section 5. They are to encourage:

- the proper management, development and conservation of natural and man-made resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment;
- the promotion and co-ordination of the orderly and economic use and development of land;
- the protection, provision and co-ordination of communication and utility services;
- the provision of land for public purposes;
- the provision and co-ordination of community services and facilities;
- the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats; and
- ecologically sustainable development.

In addition, the Act aims to

- promote the sharing of the responsibility for environmental planning between the different levels of government in the State; and
- provide increased opportunity for public involvement and participation in environmental planning and assessment.

Under section 5(a)(1) the objectives of the legislation are not restricted to traditional town and country planning concerns. They extend to the management and development of natural resources, including forests. In addition, another section of the Act states that environmental planning instruments can provide for 'protecting, improving or utilising, to the best advantage, the environment'. The Act defines 'environment' very broadly to include 'all aspects of the surroundings of man, whether affecting him as an individual or in his social groupings'.

However, the fact that environmental planning instruments can contain provisions going beyond the traditional, limited concerns of 'town planning' does not mean that they must branch out into these areas. In practice, achieving this depends on:

- the creativity of local councils and their planners, who have the initial responsibility for developing local environmental plans;

- the initiative of the Department of Urban Affairs and Planning, which is primarily responsible for regional planning;
- the supervision over drafting of instruments exercised by Parliamentary Counsel's Office, which vets environmental planning instruments and may stifle creative initiatives by conservative interpretations of the legislation; and
- the leeway allowed to local councils and other government agencies by the Minister for Urban Affairs and Planning, who in practice has broad initiation powers over regional environmental plans and State environmental planning policies, and veto powers over local environmental plans.

The Native Vegetation Conservation Act is a significant example of the way in which the Environmental Planning and Assessment Act can deliver integrated resource management legislation. Under the Native Vegetation Conservation Act, proposed regional vegetation management plans have the status of environmental planning instruments, although they will be signed off by the Minister for Land and Water Conservation rather than the Minister for Urban Affairs and Planning. Local environmental plans made under the older Act, which the relevant Minister (Land and Water Conservation) regards as satisfying vegetation conservation and management objectives, may be treated as being the equivalent of regional vegetation management plans. In addition, where approval to clear native vegetation is required under the Native Vegetation Conservation Act, it will be processed as, and take the form of, a development consent under the Environmental Planning and Assessment Act Part 4.

However, in practice the potential of Parts 3 and 4 of the Environmental Planning and Assessment Act has been restricted by its origins in town and country planning legislation. Although there are a growing number of examples of innovative use of environmental planning instruments, there remains a heavy emphasis on zoning arrangements and regulatory controls over development. On the face of the legislation there are significant opportunities for more proactive approaches. A significant example is the State Environmental Planning Policy 44, Koala Habitat Protection, which not only contains provisions designed to encourage local councils to map koala habitat in advance of particular development proposals, but also requires a plan of management

to be in place before consent is given to development on land that has been identified as core koala habitat.

One obvious limitation to the greater use of the Environmental Planning and Assessment Act as an integrating mechanism is the fact that the sole repository of plan-making power under Part 3 is the Minister for Urban Affairs and Planning. While other Government agencies can act as consent authorities under Part 4 (for example the Minister for Land and Water Conservation under the Native Vegetation Conservation Act), only the Minister for Urban Affairs and Planning can make plans under Part 3.

Recent amendments to the Environmental Planning and Assessment Act (*Environmental Planning and Assessment Amendment Act 1997*), not yet in operation, recognise the increasingly important role of the Act's development control system (under Part 4), and make some attempt to integrate the system with regulatory systems set up under older natural resources legislation. In situations where an approval in addition to development consent is required under another regulatory system (specified in the legislation), the consent authority must, under Part 4 of the Environmental Planning and Assessment Act, first seek from the regulatory agency 'the general terms of any approval proposed to be granted'. In this situation the regulatory agency retains the option of refusing approval. However, if the agency fails to respond to the consent authority's request within a set time limit, the latter can determine the application. If the consent authority decides to give consent, the regulatory agency must also grant an approval, which must not be inconsistent with the terms of the development consent. Where the development is classified as State significant development, the Minister for Urban Affairs and Planning is the consent authority under Part 4 of the Environmental Planning and Assessment Act. In this situation, where there is disagreement between the Minister and the other agency, the dispute is to be referred to the Premier.

These integrating procedures will, however, only operate where development consent under the Environmental Planning and Assessment Act is required. One difficulty with these provisions is that although some modifications have been made to the older natural resource regulatory systems, they are still left substantially intact. Separate approvals under different pieces of legislation must still ultimately be obtained rather than relying on a single regulatory system with

common procedures and a single approval (that is, the Environmental Planning and Assessment Act Part 4).

Under the proposed amendments, regulatory agencies will face the difficult task of having to make a general binding determination of their attitude towards a specific proposal, based on the development application under Part 4 of the Environmental Planning and Assessment Act, before they have received an application under the regulatory system they administer. The expectation is, however, that regulations currently being developed will be made so as to allow agencies to 'stop the clock' on the time they have in which to provide the general terms of their approval by requesting further information.

An alternative approach would be to make more liberal use of the concurrence procedure under the Environmental Planning and Assessment Act Part 4. A concurrence requirement is quite different from a mere consultation requirement, as it allows the 'concurring' agency a right of veto. Instead of having to decide whether to issue a separate approval under separate procedures, an agency with a specialist contribution to make to the decision-making process would have to consider whether or not to concur with a proposal before a Part 4 consent could be issued, and under what conditions it would be prepared to concur. If the agency did not concur, consent under Part 4 could not be given. This would make the process a 'single decision' process. This model has already been employed in the *Threatened Species Conservation Act 1995*. The Government rejected the concurrence approach as a vehicle for the integrated approvals process discussed above on the grounds that the model ultimately chosen allowed greater 'flexibility' of assessment for both the regulatory agencies and the applicant. The unresolved concern is that such flexibility may be at the expense of transparency of process.

Recommendation 2.5: A whole of government process to develop natural resources legislation should be put in place. Parts 3 and 4 of the *Environmental Planning and Assessment Act 1995* should be considered as a potential vehicle for integrating natural resource management in view of the following characteristics of that legislation:

- broad plan-making powers;
- a well-developed assessment procedures and approvals process;

- a well-understood system of community participation including review by the courts;
- potential to move beyond constraints on land use to active management;
- potential applicability to both public and private land.

In the short term, to reduce complexity at the level of operational regulation and as a move towards a 'one-stop shop':

- there should be a review of separate requirements for approvals under existing legislation with a view to replacing them with concurrence procedures.

Recommendation 2.6: The Environmental Planning and Assessment Act should be amended so as to enable Ministers other than the Minister for Urban Affairs and Planning to make environmental planning instruments. Appropriate arrangements should be made to ensure consistency between instruments.

NATIVE VEGETATION CLEARANCE

Bioregional planning and the CAR reserve system

The Native Vegetation Conservation Act recognises the crucial role of strategic regional planning in identifying key conservation areas, and delimiting landholder expectations relating to land use well in advance of particular development proposals. The necessity for such a regional planning framework is confirmed by the expert working group's interpretation of the elements of the first New South Wales principle of ecologically sustainable forest management. This interpretation is that ecological sustainability is a precondition that must be satisfied before approvals to carry out particular activities are given. In other words, economic benefits can only be pursued within the constraints of ecological sustainability.

In the context of economic development, ecological sustainability must necessarily be considered on a regional basis through a strategic planning mechanism, with decisions on individual applications being taken on the basis of the regional plan. Ecologically sustainable forest management cannot be achieved through ad hoc case-by-case assessments, but only through assessment of proposals in the context of a

planning framework designed to protect appropriate areas at a regional level.

While regional vegetation management plans made under the Native Vegetation Conservation Act will not cover land in public ownership, such as State forests and national parks, it is crucial that information about the conservation status of species and vegetation communities in these publicly managed areas inform the regional vegetation planning process. This appears to be contemplated by section 27 of the Act.

The Native Vegetation Conservation Act will play a crucial role in protecting forest types on private land that are identified as being part of the CAR forest reserve system. The most recent version of the JANIS reserve criteria (JANIS 1997), makes it clear that the CAR reserve system will incorporate not only dedicated reserves and informal reserves on public land, but also areas of private land with forest types not adequately represented on public land:

Many of the most threatened forest species and ecosystems throughout Australia occur on private lands, especially in coastal areas and across agricultural lands. There is an urgent need for specific measures to address their conservation in the development of the CAR reserve system as opportunities for their conservation are rapidly foreclosing.

In this context, the provision of incentives is a crucial component of any regulatory strategy, and this is recognised in the Native Vegetation Conservation Act with the establishment of a native vegetation management fund.

The Native Vegetation Conservation Act provides that a region 'may comprise any one or more local government areas (or parts of local government areas) to generally reflect biogeographic boundaries' (s 8).

The national strategy for biodiversity requires that planning must be carried out on a bioregional basis using natural boundaries such as vegetation types, catchments and climatic factors. The draft State strategy identifies as a priority to be completed by 2000, the need to:

Develop and promote a model bioregional planning framework and process which identifies and develops mechanisms between all spheres of government, including Local Government, to ensure cooperative and coordinated land use planning involving full and continued community participation

In light of the crucial role to be played by regional vegetation management plans in protecting

vegetation on private land under the CAR reserve system, the limited role given to the National Parks and Wildlife Service in relation to making those plans is surprising. Although the service will have a representative on each regional vegetation committee, its Director-General is only to be consulted by the committee regarding *threatened* species and their habitats. The expert working group considers that the Director-General should have a broader consultative role, given the service's broad brief in the area of off-reserve management. However, this situation is addressed to some extent by allowing the Minister for the Environment to make recommendations to the Minister for Land and Water Conservation in relation to all aspects of the plan. If the latter decides not to follow any of these recommendations, (s)he must provide reasons in a report.

Under the Native Vegetation Conservation Act, regional vegetation committees and their authorised officers are not provided with any power to enter private land for the purpose of carrying out assessments prior to formulating draft regional vegetation management plans. This is a significant obstacle in the way of effective bioregional planning.

Recommendation 2.7 : Regional vegetation committees and authorised officers should have powers of entry over private land for the purposes of regional vegetation management planning.

Regional vegetation management plans and the CAR reserve system

While the Native Vegetation Conservation Act specifically provides that regional vegetation management plans can contain provisions allowing native vegetation to be cleared with or even without consent, depending on the circumstances, there is no specific reference to the possibility of consent to clearing being absolutely prohibited. The expert working group is concerned that regional vegetation management plans will be no more than clearing plans which do not set any effective ground rules, indicating areas of vegetation that should be retained and actively managed, particularly where such areas are needed as part of the CAR reserve system. There is not even any guarantee that proposals to clear areas of potentially significant native vegetation will be subject to environmental impact assessment by the proposal being classified as 'designated development' under the Environment

Planning and Assessment Act Part 4, although this approach would be possible for individual plans. However, the limited assessment provisions of the Threatened Species Conservation Act will apply.

It is clear that conservation of significant areas on private land cannot be achieved through prohibition alone. Regulation of vegetation clearance must necessarily be combined with the provision of management incentives to landholders, through the conclusion of voluntary property agreements, as provided for in the Native Vegetation Conservation Act. At the same time, it is crucial that there should be a commitment in regional vegetation management plans to the retention of these areas. Following the implementation of regional forest agreements, regional vegetation management plans will comprise the strategic vegetation plan for areas of land in private ownership.

Recommendation 2.8 : Regional vegetation management plans should clearly indicate the areas of private land necessary to complete the CAR (comprehensive, adequate and representative) forest reserve system. The forests should be protected through prohibitions on clearing and the negotiation of registered property agreements with landholders. These agreements should ensure landholders receive attractive financial incentives to manage the land in a way that is consistent with conservation objectives.

The exemption for residential land

The Native Vegetation Conservation Act does not apply to land zoned residential. This means that urban subdivision will not be regulated under a strategic scheme with a *regional* perspective but will be left to the initiative of individual local councils, many of which have very limited expertise.

In particular, the provisions of the Threatened Species Conservation Act are causing problems for councils. Councils considering development applications for subdivisions must decide whether such development is likely to significantly affect threatened species. If this is the case, a species impact statement must be considered and the concurrence of the Director General of National Parks and Wildlife is required for the development. Some confusion has arisen as to the role of the National Parks and Wildlife Service. While local councils, for example, would like the Service to be involved at an early stage in the process of deciding whether a proposal is likely to

have a significant effect, the legislation clearly places this initial onus on the councils. The Service equally wants to take a strategic approach, focusing on the incorporation of appropriate provisions in environmental planning instruments rather than responding to proposals on an ad hoc basis. It could more easily do this through the regional vegetation planning process under the Native Vegetation Conservation Act.

It is increasingly clear that some threatened species habitats and communities are located in forest remnants in coastal areas where the pressure of urban subdivision is greatest. Protection of these habitats and communities has long been left to the discretion of local councils with varying degrees of success.

Recommendation 2.9: Strategic and operational planning decisions about the protection of native vegetation from subdivision pressures should be brought within the Native Vegetation Conservation Act in order to ensure that vegetation conservation is considered in a regional context.

The two-hectare exemption

Transitional arrangements under the Native Vegetation Conservation Act provide that activities that were exempt from the need to obtain development consent under Schedule 3 of State Environmental Planning Policy 46 will continue to be exempt under the new regime until this situation is altered by regulation or the development of a regional vegetation management plan.

Under these arrangements, the 'clearing of up to 2 hectares per annum for any contiguous land holding in the same ownership' will continue to be exempt from the need to obtain development consent under the Native Vegetation Conservation Act. However, this exemption does not override local tree preservation orders and provisions in local environmental plans that require development consent to be obtained. These provisions are only overridden where an activity has been given development consent under the Act and not, apparently, where an exemption applies.

Once a regional vegetation management plan is in place, it will override local regulatory requirements even in situations where clearing under the plan is permitted *without* development consent, unless the particular local government area has been exempted from the provisions of the Act (see above).

Relationship with threatened species legislation

The overlay of the *Threatened Species Conservation Act 1995* will continue to apply under the Native Vegetation Conservation Act, but a significant adjustment will be made to the procedure which applied under State Environmental Planning Policy 46. The concurrence of the Director-General of National Parks and Wildlife will no longer be required in situations where a proposal is likely to significantly affect threatened species.

This is because, under the Native Vegetation Conservation Act, the consent authority under the Environmental Planning and Assessment Act Part 4 will be the Minister for Land and Water Conservation rather than the Director-General of Land and Water Conservation, formerly the consent authority under the State Environmental Planning Policy 46. Where the Minister is the consent authority, then the only requirement under the *Threatened Species Conservation Act 1995* is to *consult* with the Minister for the Environment in relation to threatened species issues. There is no power of veto over the application in these circumstances.

FORESTRY ON LAND IN PRIVATE OWNERSHIP

Introduction

Even after the enactment of the Native Vegetation Conservation Act, there is no legislative regime in New South Wales which specifically addresses the question of forestry and timber production on private land, except in the case of plantation forestry (*Timber Plantations (Harvest Guarantee) Act 1995*). The general approach has been to treat forestry on private land as a variety of land clearing. Consequently, insofar as there has been any regulation, it has focused on the final step in the activity, that is, logging, rather than the broader dimensions of sustainable forest management. This includes the provision of incentives to manage the land as forest rather than converting it permanently to agriculture. A crucial issue in any consideration of incentives is the extent to which those who manage land for sustainable forestry should be given guarantees that they will be able to harvest the timber resource at an appropriate time in the future.

In the past, the protected lands provisions of the Soil Conservation Act have been used as the

primary mechanism for regulating private forestry in areas where they applied. This included mapped areas of steeply sloping land and the area within 20 metres of the bed or bank of specified rivers and lakes. Under the State Environmental Planning Policy 46, which introduced clearing controls in much of the remainder of the State not covered by the protected land provisions, there was a specific exemption for Private Native Forestry from the general requirement to obtain development consent for the clearing of native vegetation.

Following changes introduced by the Native Vegetation Conservation Act, this position is essentially preserved. Until a regional vegetation management plan is in place, logging operations on protected land, now referred to as State protected land, will still require approval, but this now will be in the shape of a development consent under the Environmental Planning and Assessment Act Part 4, instead of an authority under the Soil Conservation Act (to which the environmental assessment provisions of the Environmental Planning and Assessment Act Part 5 applied). In other areas, the State Environmental Planning Policy 46 exemption for Private Native Forestry will continue to operate as a transitional arrangement until a regional vegetation management plan is in place.

Under the exemption, Private Native Forestry is defined as:

The clearing of native vegetation in a native forest in the course of its being selectively logged on a sustainable basis or managed for forestry purposes (timber production).

This suggests that management for forestry purposes is an *alternative* to selective logging on a sustainable basis, and by implication does not have to be sustainable. This suggestion is, however, dismissed in the 1997 amendment to State Environmental Planning Policy No 46 which states that '[m]anaged for forestry purposes is taken to be managing native forest on a sustainable basis whilst allowing for timber production' (p 19). At the same time, this document makes it clear that the task of applying this definition lies with individual landholders. This is quite inappropriate given the ambiguity of the language and the variety of definitions of sustainable forestry canvassed in the document. There is a compelling argument that this matter should not be left with individual landholders, but should be supervised by a Government agency through a regulatory process, which embodies a

compulsory code of practice (see Recommendation 3.26).

There is in fact provision in the Native Vegetation Conservation Act for operations such as private forestry to be regulated through native vegetation codes of practice, although this does not apply to protected land.

The exemption for private forestry conflicts with the National Forest Policy Statement, which indicates that existing codes of practice for wood production in public native forests are to be made applicable to private native forests. It is also inconsistent with the State Labor Government's Forest Policy which stated that a 'compulsory Code of Logging Practice will be established by statute and will apply to both public and private lands. The Code of Practice will include third party enforcement and appeal rights' (p 6). Note, however, that this commitment is only to a code of *logging* practice, whereas the expert working group would argue that there should be a code of practice for *sustainable forestry* which would be operationalised through private forest management plans made by individual landholders engaged in commercial forestry operations.

Forestry Provisions in local environmental plans

Logging activities in certain areas may be captured within requirements in local environmental plans made under the Environmental Planning and Assessment Act to obtain development consent for 'clearing'. Tree preservation orders may regulate logging where they apply to rural areas. On rare occasions, there may even be a specific requirement to obtain development consent for forestry, although in general rural zones, this is generally permissible without consent. Where development consent is required under such provisions, it will not be affected by the private forestry exemption under the Native Vegetation Conservation Act. These local provisions are only overridden in situations where an activity has been given development consent under the Act, not, apparently, where an exemption applies.

Once, however, a regional vegetation management plan has been made, it will override these local regulatory requirements unless the particular local government area has been exempted from the provisions of the Act (see above).

Erosion and Pollution Control

The private forestry exemption discussed above only relates to development consent under Part 4 of the Environmental Planning and Assessment Act. The Soil Conservation Commissioner can still regulate threats of soil erosion and land degradation by issuing notices under section 15A of the *Soil Conservation Act 1938*.

In addition, where soil disturbance is likely to result in water pollution, this is a criminal offence under the pollution legislation (Clean Waters Act/Pollution Control Act, shortly to be replaced by the Protection of the Environment Operations Act) unless a pollution control licence has been obtained from the Environment Protection Authority.

In practice, private forestry activities are not licensed by the Environment Protection Authority. The position of the Environment Protection Authority is that it will respond to licence applications received, and that in practice, it does not receive applications from those carrying out private forestry. Yet whether or not applications are made will depend substantially on how vigorous the Environment Protection Authority is in policing the pollution legislation. There is no evidence of any systematic audit of private forestry activities by the Environment Protection Authority. Historically, although the definition of 'pollution' in the Clean Waters Act has been broad enough to include diffuse run-off, the focus of the State Pollution Control Commission, and subsequently the Environment Protection Authority, has been on the regulation of point source pollution. However, the Environment Protection Authority now licences logging activities carried out on State forests, requiring land management practices designed to reduce the risk of polluting run-off. The Department of Land and Water Conservation has been involved in the development of pollution control licences for State Forests, based on its legal powers under the Soil Conservation Act. There is no reason why a similar approach should not be taken to private forestry operations. The first step would be for the Environment Protection Authority to make it clear that it will be prepared to take legal proceedings against private forestry operations which pollute without a licence.

The Protection of the Environment Operations Act, when it comes into operation, will allow the Minister for the Environment to make Protection of the Environment Policies (PEPs), prepared by the Environment Protection Authority and made

available for public comment in draft form. A PEP, for example, could be made to provide guidelines or standards relating to private forestry management practices designed to prevent diffuse water pollution.

Threatened Species

There is considerable confusion as to the impact of the provisions of the Threatened Species Conservation Act on private forestry in light of the private native forestry exemption from the need to obtain development consent in the Native Vegetation Conservation Act.

Where neither development consent nor any other kind of approval is required for private logging, a licence from the National Parks and Wildlife Service under Threatened Species Conservation Act Part 6 may be required to avoid conviction of offences under the National Parks and Wildlife Act of damaging critical habitat or knowingly damaging the habitat of threatened species, populations or ecological communities. However, in theory, a licence to pollute waters should be sought where there is diffuse run-off from logging operations. This would attract the operation of Environmental Planning and Assessment Act Part 5, and compliance with this would avoid the need for a licence under the Threatened Species Conservation Act Part 6. However, in practice, pollution licensing of private forestry does not occur. Therefore it would appear that where there is likely to be a significant effect on threatened species, populations or ecological communities, or their habitats, a licence would be required under the Threatened Species Conservation Act Part 6.

Where private forestry is likely to significantly affect threatened species, populations or ecological communities, or their habitats, a species impact statement will have to be prepared, whether the application is processed under the Environmental Planning and Assessment Act Parts 4 or 5 or the Threatened Species Conservation Act Part 6.

Plantations

The *Timber Plantations (Harvest Guarantee) Act 1995* deals with harvesting operations on plantations accredited by the Director-General of Urban Affairs and Planning. In essence, it substantially deregulates 'harvesting operations' by exempting them from specified regulatory requirements (for example, those relating to threatened species) while insisting that they are carried out in accordance with timber plantation

(environment protection) harvesting codes. Not all regulatory requirements are excluded. Pollution licensing requirements still apply.

Harvesting operations include on-going management of the plantation and the provision of access roads, but exclude initial establishment, such as the clearing of natural forests.

Accreditation of a timber plantation can be cancelled where necessary to protect unique or special wildlife values. Compensation must be paid.

The Timber Plantations (Environment Protection) Harvesting Code 1997 has now been adopted (Timber Plantations (Harvest Guarantee) Regulation 1997). It requires the preparation of a harvesting plan, as well as specific provisions relating to the protection of soil and water. Factors to be considered in preparing a harvesting plan include the ecological values of wetlands and the protection of their function as filters, and the existence of relics. There is no requirement to consider biodiversity values in the plan itself, but there is a general requirement to notify 'any aspect of plantation operations that has an impact on unique or special wildlife values', defined narrowly to cover only certain species listed as endangered (not vulnerable) in the Threatened Species Conservation Act. Thus, for example, invertebrates are not covered. Plantation operations covered would include silvicultural practices. Once notified, the Director-General of Urban Affairs and Planning must decide whether to suspend (including permanent suspension) or modify harvesting operations. Compensation is available.

The legislation has nothing to say about the *establishment* of plantations. Whether or not the clearing of native vegetation to establish a plantation is regulated will depend on the provisions of the Native Vegetation Conservation Act and, in the longer term, regional vegetation management plans. The significant transitional exemption is that which permits the clearing of regrowth of less than 10 years without the need to obtain development consent. One approach being considered is the development of a code of practice under the Act, dealing with plantation establishment. The expert working group strongly supports this initiative.

Conclusion

It would be a significant understatement to conclude that the law and policy relating to

private forestry is complex, confused and inconsistent. At present, private forestry is treated as a specialised form of land clearing operation and, in practice, it is generally exempt from any regulatory requirements, except where it takes place on protected lands.

Regional vegetation management plans should identify those areas where private native forestry, as distinct from land clearing, is not an acceptable form of land use within the broad parameters set by the commitment in the National Forest Policy Statement to put in place a CAR reserve system and to provide for sympathetic off-reserve management. It is clear that, within these constraints, even sustainable forestry will not be an acceptable land use in some areas.

A necessary prerequisite for identification of these areas is the implementation of a system of assessment of conservation resources on land in private ownership. Potential impact on values must be assessed at an appropriate scale which may be larger or smaller than the area of the regional vegetation management plan.

Strategic regional planning based on adequate information will significantly reduce the need for environmental and species impact assessment at the operational level.

Because private native forestry is a fundamentally different activity from land clearing for agricultural and residential purposes, an exemption for sustainable private native forestry from regulatory requirements concerned with land clearing is quite appropriate. However, at the same time, it is quite inappropriate to leave assessments of what constitutes sustainable forestry to those who wish to engage in these activities. Those engaged in private native forestry operations should be required to conduct their operations in accordance with a private forest management plan, setting minimum standards for the achievement of ecologically sustainable forest management in relation to the whole forestry operation, including the silvicultural regime to be applied, the rotation, and provision for regeneration following harvesting. Management Plans should be based on a Code of Practice for Private Forestry (see, for example, the *Tasmanian Forest Practices Code* (January 1993)). Operational timber harvesting plans should also be required, and should incorporate a condition for a pre-logging species survey. These proposals are developed in Chapter 3, and appropriate recommendations are made.

One possibility could be the provision of some element of security of access to the resource in return for management in accordance with the plan. The Timber Plantations (Harvest Guarantee) Act should be considered as a possible model.

CODES OF PRACTICE

The expert working group believes that greater use of codes of practice could be a way of setting out enforceable expectations relating to ecologically sustainable forest management. Some codes of practice already exist but, with the exception of the Timber Plantations (Environmental Protection) Harvesting Code 1997, discussed above, these are substantially confined to activities on State forests. Codes of practice are discussed in detail in Chapter 3.

INTERNAL POLICY STATEMENTS: STATE FORESTS OF NEW SOUTH WALES AND NATIONAL PARKS AND WILDLIFE SERVICE

Legislation establishing an Agency's role or activities may be supported by a series of policy statements which express, in a general way, the Agency's principal objectives, and ways in which its roles and activities will be addressed. This Section briefly reviews internal policies of the two Agencies responsible for the public forests of New South Wales, that is, State Forests of New South Wales and National Parks and Wildlife Service.

STATE FORESTS OF NEW SOUTH WALES POLICY STATEMENTS

The historical review of management practice (Chapter 1) shows that while the Indigenous Forest Policy - with its emphasis on wood supply - dominated forest practice from the mid-1970s, there has been a growing appreciation since this time of the greater emphasis that must be placed on environmental conservation in forest management.

A change in social perceptions of the values and roles of public forests has been common to all Australian States. As pressures grew nationally to formulate more socially acceptable policies and practices, the Standing Committee of the Australian Forestry Council (1991) prepared a Statement on wood production to which all States were committed. The statement cites as one of the principles of environmental care the 'ecologically and silviculturally sound reforestation principles

within native forests'. However, the Statement does not define this in more specific terms, nor does it commit the States to formulating the strategies, management plans and practices needed to implement the policy. It therefore cannot be said to have delivered, or to have contributed to the delivery of, ecologically sustainable forest management.

Forest management in New South Wales was to change appreciably from 1992 following the challenge to harvesting under the National Parks and Wildlife Service Act, and a raft of new legislation extending the preparation of environmental impact statements and imposing regulatory procedures through external agencies. Subsequently, a number of policies have been formulated by the New South Wales Government and State Forests of New South Wales, placing forest management in a modern environmental context.

The State Labor Government's Forest Policy refers to a regulatory and operational structure that will ensure 'ecologically sustainable development'. A more specific policy along these lines is that within the State Forests of New South Wales Corporate Plan of 1995. The Corporate Plan sets out a 'Vision' (to be recognised as the nation's leading forestry agency through excellence in progressive and responsive forest management), and a 'Mission' (to manage forests in an environmentally responsible manner, supply products and services to meet customer expectations and achieve a commercial return). The Plan seeks to demonstrate sustainability in forest management through 'world's best environmental practice', and by defining 'the forest resource available for long term sustainable forest management'. This is to be achieved through Regional Forest Agreements, with auditing of standards and external certification. These policies have the potential to deliver ecologically sustainable forest management, notably through the RFA process.

Similarly, the Environment Policy Statement of 1996 commits State Forests to adopting 'best practice' in sustainable management. However, there is no interpretation of just what constitutes best practice. If best practice entails a commitment to ecologically sustainable silvicultural practice, and ecologically sustainable levels of wood harvest, then the Policy is potentially capable of delivering ecologically sustainable forest management.

The expert working group suggests that both the Corporate Plan and the Environmental Policy could well be supported by more specific policy statements, for example, on conservation, flora and fauna, water and soil management, and silvicultural practice. State Forests of New South Wales appreciates the need for a modern silvicultural policy. While the Indigenous Forest Policy no longer underpins silvicultural practice, it has not been superseded by any alternative policy. State Forests of New South Wales held a workshop in May 1997 to consider the content of a silvicultural policy based on a better appreciation of ecological principles, and able to deliver ecologically sustainable forest management. However, the formulation of the policy was not completed in time for the RFA process.

State Forests of New South Wales have a number of current policy statements covering other forest uses and practices, mainly prepared during the 1980s. These include policies relating to native forest preservation, recreation, grazing, hunting and materials extraction. Some of these will need to be updated in the light of the ecologically sustainable forest management criteria.

RELATIONSHIPS BETWEEN POLICIES, STRATEGIC AND OPERATIONAL PLANS AND OTHER DOCUMENTS

State Forests of New South Wales recognises there are problems in its policy/planning structure. For example, in some cases management elements overlap, while in others the management process is not obvious. The management elements used by State Forests suffer from a number of apparent deficiencies which arise from the way in which instructions are written (from 'Overview of management elements used by State Forests of New South Wales for public forests in NSW in relation to ecologically sustainable forest management/environment management system').

This has allowed the development of protocols and codes of practice at a functional, regional and/or district level which do not necessarily meet the requirements of the ecologically sustainable forest management criteria or the intent of the Corporate Plan, but may reflect a practical interpretation of what is required at district level.

Moreover, the expert working group sees a lack of understanding of the common hierarchy of legislation, corporate and other policies, strategies, operational and other processes, audit

and review. Consequently, there is inadequate appreciation of the links between these components in complying with the organisation's environmental policies and, through them, the legislation. Thus documents produced in good faith have frequently been developed in the absence of clear policies, and these may reflect current practice rather than a response to 'best practice'.

This problem has now been recognised by senior management and plans are being made to strengthen the link between the Government policy and the corporate plan. In addition, the absence of common core policies and strategies on a range of environmental and other issues has also been recognised, and actions commenced to rectify the problem. The State Forests of New South Wales 'Overview of management elements..' notes that:

Policy is now vested in one corporate group in State Forests' Forest Policy and Programs Division with the intent to permeate all future policies and strategic directions with ecologically sustainable forest management principles...

Recommendation 2.10:

In order to reinforce the importance of State Forests of New South Wales's commitment to the policy objectives, the expert working group recommends that State Forests of New South Wales:

- **commits itself to the development of those general and specific policies necessary to implement national and state Government environment and forest policies, and the organisation's corporate objectives;**
- **documents for staff a clear linkage between legislation, corporate and other policies, strategic plans, operational and other processes, and audit and review processes; and, more specifically, the importance of the hierarchy in delivering ecologically sustainable forest management principles; and**
- **develops a policy which, among other things, recognises the ecological and silvicultural principles upon which silvicultural practice must be based, the range of values for which forests are now managed, the need to integrate wood production and environmental objectives through silvicultural practice, and the diversity in silvicultural practice needed to achieve multiple-use objectives.**

NATIONAL PARKS AND WILDLIFE SERVICE POLICY STATEMENTS

The National Parks and Wildlife Service has both a managerial and regulatory role under the legislation which it administers. The National Parks and Wildlife Service has responded to these responsibilities by developing a mission statement which is:

Working with the community to conserve and foster appreciation of nature, Aboriginal heritage and historic heritage in New South Wales.

The mission is being implemented through the development of a corporate plan which has five key program areas:

- Conservation policy, assessment and planning
- Protection of conservation assets
- Promotion of conservation
- Regional park management
- Service wide support and development.

These key programs are supported by some 57 lower order objectives and targets. With respect to ecologically sustainable forest management these include:

- Implement the National Biodiversity Strategy through the development of a State Biodiversity Strategy;
- Provide Service input into the development of model forestry management plans to assist in achieving ecologically sustainable forest management;
- Identify in consultation with other agencies, ways in which the Service can pursue an ecosystem management approach in environmental planning and management; and
- Develop and coordinate a state wide endangered species conservation program, including recovery planning and necessary research and survey.

The content of the corporate plan is, in part, supported by a policy framework defined in a series of documents - including documents providing guidance on the Environmental Planning and Assessment Act; Threatened Species Management Circulars and an internal Threatened Species Management Procedures Manual; and manuals dealing with Wilderness, Law Enforcement and Public Enquiries, and Concessions and Leases. There are also many

internally focused manuals dealing with safety and administrative matters.

Perusal of these manuals indicates that, during the late 80s to early 90s, there was a strong focus on policy development related initially to staff management and associated issues. Later documents reflect environmental issues such as wilderness, vertebrate control, threatened species, and so on. However, a number of the manuals dated between 1989-1993 may be out of date in that they may not reflect policy changes.

THE BALANCE BETWEEN WOOD PRODUCTION AND CONSERVATION IN LAND USE PLANNING

The achievement of a socially acceptable balance between wood production and environmental conservation is at the heart of the RFA process. The principles underpinning this balance are set out in the National Forest Policy and the Report of the Joint ANZECC/MCFFA National Forest Policy Statement Implementation Sub-committee (JANIS) Report).

The National Forest Policy is essentially about 'balanced development'. It provides both for protection of the full range of forest ecosystems and other environmental values; and, 'as one of its principal objectives', the sustainable economic use of native forests and plantations.

The conservation objectives of the National Forest Policy are to be achieved through a CAR reserve system incorporating four elements:

- the Dedicated Reserve system on public land;
- conservation zones within State forests designated in approved forest management plans;
- designated areas on State forests managed by prescription to achieve specified conservation targets; and
- conservation zones on private land protected through covenants that bind successors in title.

The expert working group accepts that the JANIS conservation criteria should be achieved within Dedicated Reserves wherever 'practical and practicable'. However, there are circumstances where greater emphasis should be placed on the other elements of the CAR reserve system.

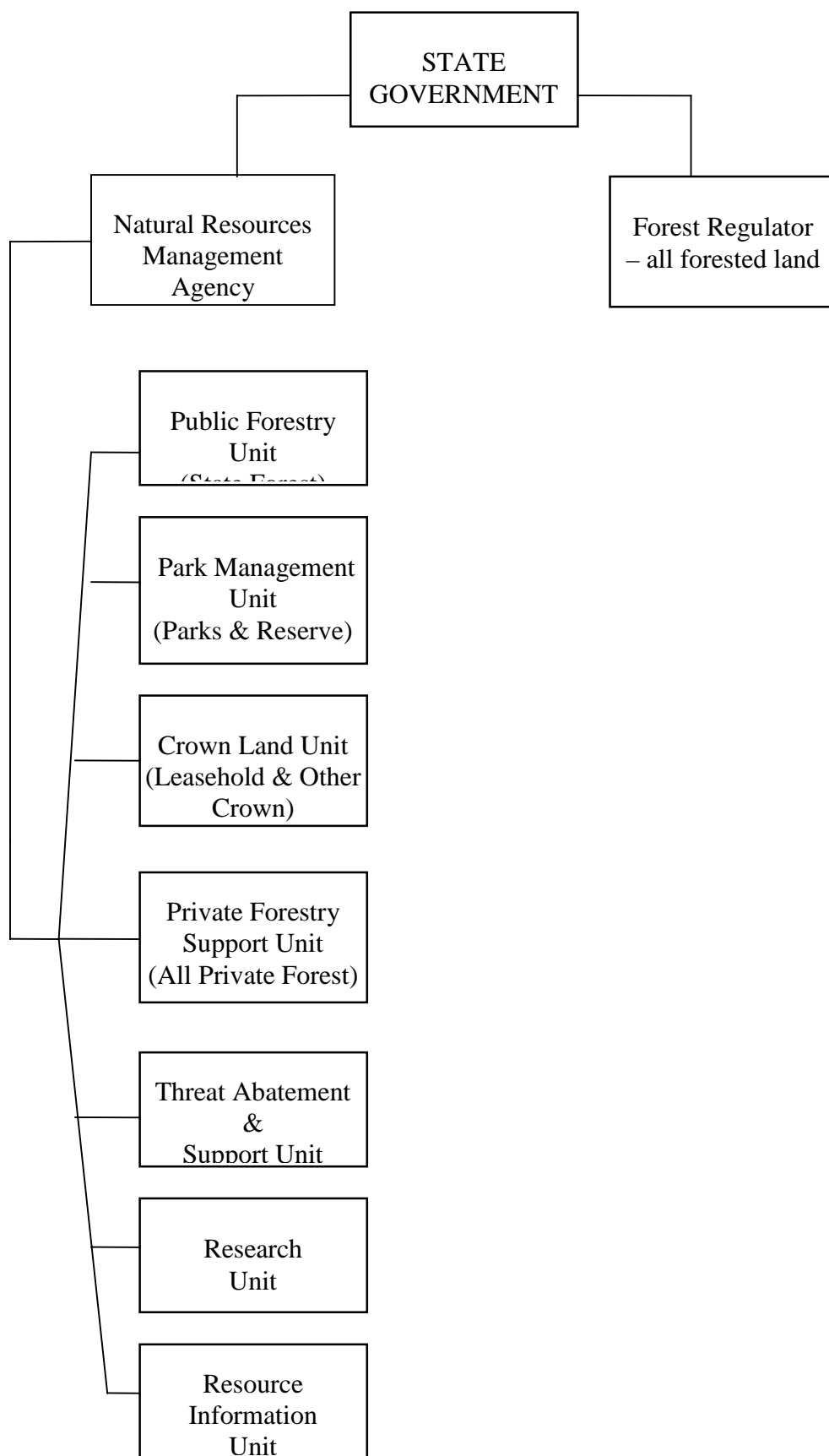
There can be no simple formula for determining the balance between the CAR reserve system elements in achieving the JANIS objectives. This must be done on a region by region and forest by

forest basis. The Group accepts that where it is necessary, on socio-economic ground, to consider a number of CAR elements in meeting the JANIS criteria (for example, in balancing economic and environmental objectives), harvests will remain within ecologically sustainable limits, and account taken in land use planning of the following:

- Where specified forest types are more than adequately represented within the present Dedicated Reserve system, some transfer of forest from national park to state forest might be considered. Reallocation at a whole forest level is not envisaged. Rather, land transfer might be done by adjusting national park-state forest boundaries, and placing the transferred land in some 'special management' category (Chapter 4).
- Where specified biotypes are only moderately represented within Dedicated Reserves, and any increase in that representation would unduly jeopardise regional industry prospects, land use determination might take account of the present forest condition and its future ecologically sustainable forest management management. For example, rather than transfer an unduly large area of forest to national park, part of that forest might be managed for continuing wood production as a special management area. The joint management of Pine Creek State Forest for conservation of koalas and wood production is a good case in point.

This theme is further developed in Section 3.3.7 where a key recommendation (number 3.43) is made.

Figure 1 - Proposed institutional framework for forest management in New South Wales



PLANNING

This chapter examines current information systems, planning and management systems and processes in State Forests of New South Wales and National Parks and Wildlife Service, and the potential of those systems and processes to deliver ecologically sustainable forest management.

The delivery of ecologically sustainable forest management will be possible only where there is access to comprehensive, up-to-date and low-cost information for planning and management of biodiversity, soils, water and economic values at the regional scale and across all tenure boundaries; and where strategic and operational planning and management systems and processes are responsive to an agency's corporate plan and other policies relevant to the delivery of ecologically sustainable forest management.

ESFM INFORMATION REQUIREMENTS

Comprehensive, up-to-date and low-cost information systems for the planning and management of biodiversity, soil, water, cultural heritage and economic values at the regional scale across all tenure boundaries are fundamental to the approval and implementation of models by which ecologically sustainable forest management could be delivered on private and public lands through a combination of dedicated reserves, managed public forests and regional vegetation management plans. There are as yet no such information systems in New South Wales in an integrated format.

While the collation, analysis, communication and dissemination of information for the delivery of ecologically sustainable forest management in New South Wales is currently in disarray, there are proposals to coordinate the exchange of information between separate agencies. From the discussion of the needs and problems of departments, however, the expert working group does not consider that these arrangements will be effective. This is because the major individual departments regard their information bases as strategic and tradeable assets and it is likely that various departments will

perpetuate incompatible information management systems. No single department is responsible for creating, digitising and disseminating environmental data. Different departments and agencies are responsible for separate portions of the total information base. There are substantial gaps in State-wide and regional coverage and there is no free exchange of data between departments or between government and the public. In addition, not all environmental layers required for biodiversity planning have been digitised and government agencies use different and incompatible data storage systems and methods of classification and mapping. Vegetation community mapping has been undertaken by State Forests of New South Wales in State forests, by the Department of Land and Water Conservation in the Western Division, by the National Parks and Wildlife Service in some agricultural areas, and by local councils on some private lands. Substantial gaps in information about private and public lands, including national parks and crown lands, remain. Vegetation mapping and the modelling of vegetation occurrence pre-1750 is also being undertaken in the RFA process. It is essential to overcome information management and exchange problems and to pool all available mapped and digital environmental data so as to identify gaps in current knowledge, to ensure consistency in standards, to plan and prioritise future information surveys and inventories and to deliver ecologically sustainable forest management on regional and State-wide scales.

Recommendation 3.1: Information collation, analysis, communication and dissemination for delivery of ecologically sustainable forest management in New South Wales should be improved by:

- storing, analysing and disseminating State-wide information required for delivering ecologically sustainable forest management, including all existing digital, biophysical, socio-economic and cultural heritage data;
- developing protocols for data collection;
- maintaining standards of data quality, storage and transfer;

- identifying gaps in current knowledge;
- guidance on data 'capture' (collection) and inventory activities;
- better training and advice to staff by agencies
- facilitating the free exchange of data between government agencies and making data available to stakeholders, local councils, and the public; and
- provision of existing information to interested parties for the cost of data retrieval and handling.

A single forest resource information unit should be created within the New South Wales Government to take responsibility for information management.

Instead of pooling available information to facilitate regional and State-wide planning, some agencies are withholding and copyrighting portions of the available database under their control as a means of increasing power and revenue. The National Parks and Wildlife Service has entered into a data-sharing agreement with State Forests of New South Wales, the Australian Museum and the Royal Botanic Gardens, to the exclusion of other government departments, the general public, councils and environmental practitioners. This anti-competitive monopoly is contrary to the basic principles of democratic government, subjects project planners and managers to unnecessary cost and uncertainty, constrains the introduction of regional biodiversity planning, and drains public and private funds by unnecessary duplication and reduced efficiency.

Lack of co-operation between agencies and exorbitant charging causes:

- imposition of costs that hinder the delivery of ecologically sustainable forest management;
- unnecessary duplication of information systems;
- the proliferation of different and incompatible geographic information systems;
- constraints on cross-tenure regional planning; and
- delay in movement away from project-based assessment to regional planning as a tool for the delivery of ecologically sustainable forest management.

These problems are particularly apparent in the capture, storage and dissemination of the location records of threatened species. Specifically:

- several separate databases are operated by different government and non-government

agencies over the same geographic regions (for example, the State Forests of New South Wales database, the Australian Museum, the National Parks and Wildlife Service Wildlife Atlas, the *Rare or Threatened Australian Plant* database, the Royal Australian Ornithologists Union (RAOU) bird database, and regional museum, council and herbarium databases), all of which may hold the same or distinct data in inconsistent formats);

- many biological records held in the National Parks and Wildlife Service Wildlife Atlas are not being released to the public because they are the subject of restrictive agreements with individual donors and agencies (for example, Australian Museum records are not available through the Wildlife Atlas) although these restricted records may be used against private developers by government during the planning (concurrence) process;
- some government agencies are selling wildlife records for profit and restricting their repeated use or the transfer of their data to third parties;
- government claims of copyright over species location records may not be legally supportable, especially as many of these records were initially collected by public and private consultants and volunteers;
- there is no consistency in standards of data quality control and the same records may duplicated in different databases;
- government departments can and do quarantine some species records from public access without transparent or adequate reason or explanation.

Recommendation 3.2: That the New South Wales Government take legal advice on the right to copyright and trade biodiversity records. Departments should only accept records into their databases on condition that they be available for placement in the public domain. Some records may be quarantined from general public access where it can be shown that release would pose a significant threat to population survival (for example, location of species subject to wildlife trade).

Deficiencies in information management within the New South Wales Government are widely recognised and some progress has been made towards improvement. The National Parks and Wildlife Service has prepared a draft action plan under the New South Wales Biodiversity Strategy known as the New South Wales Biodiversity Survey Program to deal with many deficiencies in the inventory, survey and monitoring of biodiversity information. This plan

aims to provide leadership in the gathering, analysing, collating, coordination, communication and dissemination of the information needed to manage the biological diversity of New South Wales. The plan also aims to foster the free exchange of data between participants, the development of uniform standards, the carrying out and funding of regional surveys, and the communication of information via the internet. These goals require some modification to ensure that information is also transferred rapidly and at low cost to end users in the private sector. Private individuals and bodies lack access to data that are available to public institutions. To be involved in the delivery of ecologically sustainable forest management, private individuals must have access to the information databases that cover public tenures. Such free flow of data is essential for the transparency of decisions and processes as well as for the achievement of innovation and best practice planning.

Recommendation 3.3: That the New South Wales Biodiversity Survey Program be implemented as a matter of urgency, subject to modification to improve and guarantee low-cost delivery of information to stakeholders and private and public planners and managers.

A move in this direction has been initiated by the Department of Urban Affairs and Planning. The department has insisted on the release of vegetation community mapping and classification data generated during the RFA process. This initiative should be extended to include the release of all rare and threatened species records and habitat maps, and of the models generated and held by government after completion of RFAs. While much of this information will have limited use in the period prior to signing RFAs, it will be invaluable in generating regional vegetation management plans and property management plans, and in the period following signing for the purposes of wide-ranging planning and assessment processes on private land.

Recommendation 3.4: That all environmental data (including vegetation community maps, threatened species distribution maps and models, and threatened species records) generated and held by government after the completion of RFA's be made available to the general public, stakeholders and planners at no more than the cost of data retrieval and handling.

After the completion of the RFA process, all available information on the distribution of forest communities, the modelled habitats of more common threatened species, and the known location records of threatened species will have been compiled for each

RFA region. This database will, however, fall short of providing all the requirements for regional level planning of a comprehensive, adequate and representative reserve system and the protection of threatened species habitats. This is because data will still be lacking on the distribution of rare and poorly known species. Current knowledge about the distribution and abundance of rare and threatened species in New South Wales is patchy and incomplete. Survey intensity in the State forests of north-east New South Wales, (amongst the most intensively surveyed in the state), is estimated to be about 0.1 percent (one hectare in every thousand). Coverage on private lands is substantially lower. This means that most populations of rare and threatened species, especially plants, have yet to be discovered. This problem cannot be solved by habitat modelling because there are too few location records for rare and poorly known species. This means that the delivery of ecologically sustainable forest management solely by protection of forests in reserves and by regional planning (for example through the preparation of regional vegetation management plans under the *Native Vegetation Conservation Act 1997*) is not possible at present. The protection of rare species and communities in areas of public and private forest that are not part of the reservation system will depend on the continuation of project-based assessments. An important requirement will be the continuation of pre-development surveys of fauna and flora required under the *Threatened Species Conservation Act 1995* and *Environment Planning and Assessment Act 1974*. This will be the case until sufficient resources are available to conduct comprehensive regional surveys of all remnant forests.

Data collected in pre-development surveys should be compiled into a database by the forest information agency so that it can be used, for example, in the development of regional vegetation management plans. At present, the information from individual projects has not been integrated to form a database.

Similar comments apply to surveys for, and protection of cultural heritage and indigenous traditional values.

MANAGEMENT PLANNING

State Forests of New South Wales: Forest planning procedures

The agency's forest planning process has undergone numerous changes since forests were first listed and maintained as an asset under the *Forestry Act 1916*. These changes have been introduced to meet both

organisational (internal) and legal or political (external) needs. The current planning processes derive from a mix of internal and external factors and can broadly be defined as occurring at two levels:

- Strategic management, which includes:
 - Area management plans: prepared under the *Forestry Act 1916* and other Forest Commission policies during the mid to late 1980s to manage the 67 forest areas into which the State was divided. They had an initial life of 10 years; and
 - a map-based forest classification scheme which set the preferred management priority for use, or laid special emphasis on particular forest areas, and that overlaid the area management plans.
- Tactical (operational) management, which could be subdivided into:
 - Environmental impact statements or assessments, which were mostly required by external legislation to identify potential and actual environmental impacts resulting from proposed forest (harvesting) activities, and which lasted for a defined number of years;
 - Flora reserve working plans, Aboriginal place plans and other plans which centred on conservation management;
 - infrastructure plans associated with the development and management of roads and recreational facilities;
 - fire planning, which dealt primarily with fire prevention and suppression;
 - annual plans of operations (order of working) for identified compartments within a management area scheduled for logging; and
 - harvesting plans to manage and control harvesting operations in a compartment.

Strategic plans. Within the agency, the forest management plan, incorporating a ‘preferred management priority classification’ (PMP), has provided the key link between expressions of forest policy and forest operations.

From about 1990, the strong focus on preparing environmental impact statements and the need to respond to the regulatory agencies disrupted the well-ordered process of management plan preparation and review. Thus the management plans available for perusal reflect the timber management orientation of the 1980s and in particular the thrust of the Indigenous Forest Policy. Many of these plans still

apply – at least in terms of wood production management.

Fire planning within the agency is based on a 1997 policy which is concerned primarily with protecting life and property, providing barriers to high-intensity wildfires, reducing the fire hazards created by harvesting and other activities, and producing seedbeds. Nevertheless, it also refers to the use of fire to ‘... maintain specific ecological values’. The fuel management policy is based on defining specific fuel management zones and fire regimes designed to achieve protection as well as ‘ecologically sustained forest management’.

Fire management arrangements at the strategic and operational levels are made in cooperation with Bush Fire Management Committees set up under the *Rural Fires Act 1997* on a local government area basis. Bushfire risk management plans and operations plans are prepared for each area, covering all land tenures. The bushfire risk management plan seeks a balance between the protection of life and property and the conservation of environmental values. It is a balance which takes account of ecologically sustainable development principles and ultimately, but not exclusively, provides the best possible protection to life, property and assets from devastating wildfires.

State Forests prepares an annual fuel management program which is submitted to the relevant Bush Fire Management Committee with respect to its community fire protection and management burning component. Operational fuel management plans are prepared internally by State Forests in relation to fuel management operations in order to provide the information needed to undertake the operation according to the guidelines, and to provide a record of the operations and information for the future.

The agency has a fire manual designed to collate and display policies, instructions and guidelines on fire management; guidelines for the conduct of fuel reduction and post-harvest burns; a coordinated system for reporting fire incidents; and a fuel management database on hazard reduction burning and wildfire. The agency requires periodic District/Regional reporting on fire use, and conducts burning studies and other research into fire.

Grazing within forests is described elsewhere as a threat to biodiversity conservation. However, the agency has long recognised commercial grazing as a legitimate use of public forests. There is a 1984 grazing policy, but this is primarily concerned with the administration of grazing permits and licences. The grazing regime is normally prescribed broadly in the management plan, including the type and

intensity of grazing and the amount of capital improvement needed for grazing management.

Environmental Impact Statements. Following the more rigorous implementation of the Environmental Planning and Assessment Act in 1992, a comprehensive assessment and review of the potential and actual impacts of forest operations was undertaken for 14 management areas where logging was scheduled to occur. The process was managed by a team of State Forests personnel supported by external consultants. However, the process used in the assessments does not appear to be well documented, and no procedures are evident to determine how the work was done or to assess how effective the review process was so as to confirm the credibility of the outcome.

At the time it was introduced, the requirement that environmental impact statements be prepared for all activities that had a significant effect on the environment was seen by many as an environmental panacea for many of the State's environmental problems. However, the process was not designed to deliver ecologically sustainable forest management as it is now understood. For example, the environmental impact statement cannot, and has not been designed to, deliver ecologically sustainable forest management in terms of ecologically sustainable silvicultural practice.

Operational plans. Within State Forests of New South Wales' management system, forest policies and strategic management plans are delivered through numerous types and forms of operational plans, forest practices codes, operational guidelines, circulars, and regional and district instructions which cover the more detailed planning of individual operations or types of operation.

Harvesting plans have been an integral part of the harvesting process for two decades. Because of the failure to update strategic plans in recent years, harvesting plans have assumed a more significant role in management objectives and priorities. The harvest planning process has been refined and now incorporates the requirements of other agencies which have a role in regulating forest operations.

As an adjunct to harvesting plan, the New South Wales Government has recently created harvesting advisory boards to advise State Forests on how to meet supply commitments, and on the environmental considerations for timber harvesting within statutory constraints consistent with government policy. The boards could provide a co-operative forum within which the principal interest groups, other government agencies and the broader community can contribute to the management of State forests.

Harvest plans are developed in accordance with Operational Circular 95/1 which refers to the relevant legislation and the environmental impact statement for the compartment to be harvested. Harvest plans refer to the relevant operating codes of practice, the licence conditions such as those associated with pollution control, and any other special requirements. The current circular does not refer to the Threatened Species Conservation Act but does provide a reference to previous similar legislation. The circular is comprehensive and calls for a mandatory field inspection to verify and refine the data. Harvest plans are also subject to the Regulatory and Public Information Committee and to endorsement from the Environment Protection Authority and the National Parks and Wildlife Service before implementation.

National Parks and Wildlife Service: Planning procedures

The National Parks and Wildlife Service has developed management plans for the assets for which it is responsible. These plans vary in content. The more modern plans include references to biodiversity, heritage values, soil erosion and water quality, and threatened species in the context of ecologically sustainable forest management. The process for the development of a park or reserve plan is documented and made available on request to whoever is developing the plan. The content of the plan is based on a 'model plan' which is intended to provide consistency in the plan development process.

The plans of management include implementation objectives and are accompanied by a financial impact statement which contains details of the cost of implementing the plan in terms of capital and recurrent expenditure. Implementation is funded through district annual programs and is subject to the availability of funding and staff.

The National Parks and Wildlife Service has commenced a review of the current planning process with a view to its improvement. The elements of the review are wide-ranging and include such requirements as benchmarking current practices in other States, public involvement in plan preparation, assessing the effectiveness of the public exhibition process, and a review of the content of the plan.

Department of Land and Water Conservation: Planning procedures

The Department of Land and Water Conservation is responsible for managing the Crown Estate which constitutes 55 per cent of New South Wales lands. This estate includes lands reserved or dedicated for a public purpose such as recreation or travelling stock,

and unreserved lands which may be leased, licensed or left vacant. The Department of Land and Water Conservation is also responsible for commons managed under the *Commons Management Act 1989*.

Before Crown lands can be allocated for use, the Minister administering the *Crown Lands Act 1989* must be satisfied that the land has been assessed under Part 3 of the Act to determine its physical capabilities, suitable uses and, where applicable, preferred uses. The allocation of lands under the *Western Lands Act 1901* is not subject to a land-assessment process.

Although the Department of Land and Water Conservation has policies on the use of Crown lands, these do not relate specifically to the management of forests. The management of forests on Crown Lands is therefore based on the Acts or associated White papers. Formal management plans are only prepared for Crown reserves, not unreserved Crown lands. While there is a standard clause in leases and licences which precludes the taking of timber from unreserved Crown lands, there are currently no policy documents relating to these lands.

The expert working group proposes a new approach to forest planning in New South Wales. This is summarised in Figure 2 and is discussed in detail below.

ASSESSMENT OF PLANNING AGAINST THE NSW ESFM PRINCIPLES

Principle 1A: Biodiversity

Assessment for the protection of biodiversity on public lands is currently regulated by the provisions of the Threatened Species Conservation Act (threatened species and communities) and the Environment Planning and Assessment Act (general environmental values).

Assessment has three essential components:

- description of forest values (for example, biodiversity, cultural heritage) in areas subject to a development proposal or activity;
- assessment of the impacts of proposed activities on forest values; and
- testing the significance of predicted impacts by comparison with the targets of ecologically sustainable forest management.

Exemption from assessment

Some Government agencies believe that assessment of the impacts of proposed activities on forest values

is no longer necessary in some cases, and that the preparation and role of environmental impact statements should be reduced. It is considered that the cost and complexity of impact assessment could be reduced by specifying the exemptions and circumstances under which an assessment is not required. This may apply to biodiversity values when:

- a comprehensive survey and a description of forest values (for example, threatened species and communities) have been completed on the relevant site and the information is available;
- the impacts of proposed development activities on forest values are known and accepted by the scientific community;
- standard prescriptions specified in codes of practice (for example conservation protocols) have been developed and will be adopted to prevent any significant impact on rare and threatened species and communities;
- effective monitoring and enforcement procedures are in place to ensure that standard prescriptions are applied.

In the post-RFA environment, it is likely that standard prescriptions and codes of practice will be available and that monitoring and enforcement procedures will have been planned or implemented in public forests, but it is highly unlikely that comprehensive and adequate surveys of threatened species and other forest values (for example, indigenous traditional values) will have been completed. In practice, it is highly unlikely that sufficient information will be available to forego assessment in most forest habitats. Environmental impact statements should only be abandoned for public forests where pre-logging surveys are a mandatory component of codes of practice (conservation protocols), where monitoring is mandatory and where enforceable, and amelioration measures have been shown to be effective. Environmental impact statements should be retained for proposed activities which require a significant change in silvicultural practice (for example, gap and cluster felling in dry sclerophyll forest) and for which no scientifically conclusive long-term monitoring or impact data is available. On other tenures, impact assessment in some form (environmental impact statement, species impact statements) will continue to be essential for the delivery of ecologically sustainable forest management in the circumstances where:

- land zoning allows the possibility of some level of biodiversity conservation;

- no previous comprehensive biodiversity survey has been undertaken;
- impacts of proposed activities are uncertain; or
- standard prescriptions or conservation protocols (codes of practice) have not been developed or, where standard prescriptions are available, but have not been adopted under the proposed activity.

Recommendation 3.5: Development proposals for forests should be exempt from requirements to undertake 8 point tests and environmental impact statements where:

- they are within specified zones identified on proposed regional vegetation management plans and are incorporated into local environmental plans and regional environmental plans;
- comprehensive regional environmental surveys have been undertaken;
- impacts of activities are known with a high level of scientific certainty;
- approved codes of practice have been adopted for the proposed activities; and
- effective monitoring and enforcement procedures are in place.

Exemption from environmental impact statements and species impact statements could be considered where comprehensive regional environmental survey and planning (including the survey and mapping of threatened species) has been completed and codes of practices for the amelioration of impacts have been formulated for the preparation of regional vegetation management plans, property management plans and revised local environment plans or regional environment plans. National Parks and Wildlife Service has the legislative authority to exempt private and public land from licence requirements under the Threatened Species Conservation Act by licensing property management plans prepared in co-operation with the proposed regulatory unit. This mechanism appears to offer the greatest scope for the delivery of ecologically sustainable forest management outside of reserves, with planning based on previous comprehensive fauna and flora surveys or mandatory pre-logging surveys.

Private native forestry is, at least in the short term, exempt from the requirements of the *Native Vegetation Conservation Act 1997* when operations are considered to be ecologically sustainable (see Chapter 2). Operationally, the Department of Land and Water Conservation considers private forestry to be sustainable if it complies with the standard

mitigation prescriptions (codes of practice) applied to forestry operations on Protected Lands. These protocols are similar to those developed for public forests (see Codes of practice) but are more precautionary in that they restrict logging to low intensity practice (more than 50 per cent canopy retention).

8 point tests

Under the Threatened Species Conservation Act, proponents must carry out an 8 point test to assess the magnitude and importance of any impacts on listed threatened species, population and communities. Where a significant impact is likely, a species impact statement must be prepared and submitted to National Parks and Wildlife Service or a Minister for approval. The preparation of an 8 point test in most cases requires almost as much commitment of time and resources as a species impact statement.

Loopholes in the 8 point test process which can circumvent the objects of the Threatened Species Conservation Act and preclude effective delivery of ecologically sustainable forest management biodiversity values, include the following:

- lack of minimum standards for conducting pre-development surveys of threatened species and communities;
- lack of requirements for approval of 8 point tests by an independent regulatory (biodiversity) authority;
- lack of clear guidelines for distinguishing significant and non-significant impacts;
- carrying out of 8 point tests by consent authorities which may have an interest in the outcome;
- carrying out of 8 point tests where the proponent is itself the consent authority;
- 8 point tests apply only to changes in activity;
- 8 point tests only consider impacts on threatened species, communities and populations.

There is currently no legislation requiring assessments and surveys for 8 point tests to be undertaken to specified minimum standards or by accredited operators. Inadequate surveys that fail to detect threatened species may lead to false conclusions about the significance and level of impact. It is common for 8 point test surveys to detect only a portion of the threatened species actually present on development sites. Consent authorities are responsible for the accuracy of 8 point tests. They include local councils for most developments on private land and government agencies for activities on the public lands which they

manage. Consent authorities often lack the biodiversity expertise to assess the accuracy of 8 point tests, and may have a vested interest in the outcome. It is also common for consultants to come under pressure to carry out limited surveys, and to conclude that impacts will not be significant, so as to avoid the need to involve the National Parks and Wildlife Service. Thus, an 8 point tests should be considered the 'proponents case' and treated as imperfect until evaluated by an independent biodiversity authority.

Recommendation 3.6: That the 8 point test in the Threatened Species Conservation Act be revised to:

- **better reflect regional criteria and targets used for the monitoring and delivery of ecologically sustainable forest management;**
- **specify minimum standards for biodiversity survey and impact assessment;**
- **specify exemptions from the 8 point test process (for example, where proponents adhere to approved codes of practice, undertake activities under approved preferred management priorities and vegetation management plans or within exclusion zones designated under regional planning instruments (regional environment plans, local environment plans, property management plans and proposed vegetation management plans)).**

Under the Threatened Species Conservation Act there is no legal requirement for the assessment of 8 point tests by an independent biodiversity authority such as the National Parks and Wildlife Service. There are no existing guidelines to assist proponents to conduct 8 point tests or to recognise the difference between a significant and non-significant impact. Similarly, consent authorities lack clear and transparent targets for maintaining regional ecologically sustainable forest management values which can be used to determine the significance of impacts under the 8 point test. The National Parks and Wildlife Service has provided little guidance in this matter, leaving decisions on the significance of impacts to consent authorities that may have little biodiversity expertise.

Recommendation 3.7: the Threatened Species Conservation Act be modified to require approval of 8 point tests by the National Parks and Wildlife Service or an independent regulatory agency with appropriate biodiversity expertise.

This recommendation is already substantially fulfilled through the independent assessment of clearing proposals by the Department of Land and

Water Conservation on agricultural land. Its extension to forest remnants on residential land requires only small additional allocation of resources, especially if this extension were facilitated by the use of decision support systems.

While National Parks and Wildlife Service claims to be unwilling to become an approval authority for 8 point tests because of the increased resource requirement, it is already actively involved in the 8 point test process through consultation with councils and developers. Consequently, it appears that the additional step of approval could be achieved with little extra commitment of time and resources.

Information provided to consent or regulatory authorities must be comprehensive, accurate and reliable. It is therefore essential that consent authorities either carry out their own assessments or ensure that assessments by proponents are undertaken to specified minimum standards. The Department of Land and Water Conservation undertakes its own 8 point tests and environmental assessments for processing clearing and forestry applications on private lands. This provides a check on the proponent's case and ensures the maintenance of consistent standards. The cost of assessment has been reduced by preparing in-house guidelines and expert (decisions support) systems for the assessment of clearing and forestry impacts in different regions and tenures. Proponents are required to consult with the Department of Land and Water Conservation at an early stage in the development process and are encouraged to adopt standard amelioration measures which will prevent significant impacts and avoid the need for a species impact statement. This approach has been successfully tested and implemented over many years and serves as a model for other regions and tenures, particularly residential land.

Recommendation 3.8: That the Threatened Species Conservation Act be amended to require proponents to consult with the Forest Regulator early in the assessment process to maximise the opportunity for the modification of activities and proposals to avoid significant impacts where possible.

The Department of Land and Water Conservation commissioned the development of expert and decision support systems to provide a consistent and systematic approach to the assessment and mitigation of clearing and private forestry impacts on threatened fauna and fauna habitats. The earliest systems (based on rapid habitat description, prediction of threatened species occurrence, comparison of impacts with specified minimum limits to determine significance, and adoption of precautionary standardised clearing

codes and conservation protocols to mitigate significant impacts) have been operating successfully since 1993. All Department of Land and Water Conservation field officers have been trained to use the systems at a series of State-wide workshops and refresher courses. The result has been a significant increase in standards of environmental care and protection over large areas of private forest. These systems are being modified to meet the changing requirements of the Threatened Species Conservation Act. The extension of this approach to other tenures, particularly bushland remnants in residential and urban land, would overcome many of the problems and inconsistencies experienced by councils and National Parks and Wildlife Service in interpreting and applying the Threatened Species Conservation Act.

Recommendation 3.9: Local government councils and regulators develop and implement decision support systems for all major land uses to facilitate the cost-effective assessment of impacts on threatened species habitats and the delivery of consistent and transparent significance tests.

Use of a modified and updated version of the Department of Land and Water Conservation decision support system would provide immediate savings in facilitating the preparation of harvesting plans in public forests by:

- cost-effective identification of threatened species' habitats
- identification of species which should be the subject of pre-logging surveys; and
- development of relevant codes of practice (conservation protocols) to be applied to particular areas of forest.

Recommendation 3.10: Guidelines be prepared for determining when activities have a significant impact under the 8 point test, based on regional targets for the delivery of ecologically sustainable forest management and other biodiversity conservation criteria.

The 8 point test currently considers impacts on listed threatened species, communities and populations only. While there is provision under existing legislation and policy to consider impacts on protected fauna and representative communities, there is little evidence of any effective use of this legislation for the protection of non-threatened species' ecologically sustainable forest management values. In most cases, the protection of threatened species has an umbrella effect on non-threatened species. There will be cases, however, where fauna and flora populations and communities on private

land are not adequately protected. Protection of these communities will be important when they contribute to off-reserve management targets (for example, 15 per cent reserve targets). The best long-term solution to this problem lies in regional biodiversity survey and re-zoning—for example, through regional vegetation management plans, to protect identified areas of high conservation value. In the interim, the Threatened Species Conservation Act allows for some protection of such populations and communities where they are listed as threatened populations and communities.

Recommendation 3.11: All ecological communities on private land which are inadequately represented in the CAR reserve system should be considered for listing as endangered ecological communities under the Threatened Species Conservation Act to facilitate protection from potential clearing and degradation.

Current assessment processes under the Environmental Planning and Assessment Act and Threatened Species Conservation Act are generally only triggered by a change in land use. Pre-existing activities and processes which may affect threatened species and biodiversity values may escape regulation and consideration in the assessment processes. Uses which commonly affect biodiversity include frequent burning, predation by foxes and cats, disturbance by other feral animals, grazing on public lands, weed invasion, and private forestry. While some control of feral animals is achieved on agricultural land under existing provisions, this does not extend to most public and private forest. The most appropriate mechanism for dealing with these problems is that of listing these activities as threatening processes under the Threatened Species Conservation Act.

Biodiversity targets for ecologically sustainable forest management

Targets for these and other indicators are expected to be set at state and regional scales under the RFA process. Under this process, initial biodiversity targets will be established on the basis of objective scientific criteria, while final targets may be set by compromise between conservation and socio-economic values determined by stakeholder consensus (see Chapter 1, section 1.7). While the expert working group recognises that some flexibility in setting regional biodiversity targets is desirable and that this can be consistent with the notion of ecologically sustainable forest management, it considers it essential that minimum lower limits for biodiversity targets are set on the basis of the best

available scientific knowledge and the precautionary principle.

Scientific procedures for establishing precautionary minimum targets for regional biodiversity indicators have been explored in the Eden Response to Disturbance project as part of the Eden RFA process. Under this process, minimum limits for the reservation of threatened species' habitat were initially determined by population viability analysis. The resulting models generally aimed to preserve sufficient habitat to sustain populations ranging from 300-4000 individuals. Predictably, it was found that some targets required the preservation of most wood-production areas in Eden as well as existing reserves. Similarly, minimum targets for wood production set by the timber industry left little scope for the introduction of ecologically sustainable forest management practices in wood-production areas. The result of such a process is likely to be a larger national park system and a smaller but more intensively managed wood-production system. It is the opinion of the expert working group that this approach is not consistent with the intent or practice of ecologically sustainable forest management. The group considers that procedures for establishing minimum limits for biodiversity conservation and timber production in RFA regions should allow greater flexibility for the introduction of ecologically sustainable silvicultural practices. This could be achieved in a variety of ways, including the modification of regional boundaries to consider cross-border timber yields and habitat areas in calculation of population viability analysis and productivity targets; and increased recognition and consideration of the role played by ecologically sustainable management of forests outside of reserves in the maintenance and protection of biodiversity values.

Threat abatement

Threat abatement is essential for :

- eliminating and managing pre-existing threatening processes not regulated under the Environmental Planning and Assessment Act or Threatened Species Conservation Act;
- protecting biodiversity values on nature reserves and national parks threatened by exotic animals, frequent fire, grazing and weeds;
- effectively implementing recovery plans for the majority of threatened fauna and flora across public and private forest tenures.

A small number of major threatening processes account for most of the decline in biodiversity in New South Wales. These are:

- fox and cat predation on all tenures;
- habitat clearing on private land, including the fragmentation and isolation of habitat remnants;
- the loss of understorey through frequent prescribed burning in public and private forests (flora and fauna);
- the loss of tree hollows and old-growth habitat components in public and private forests; and
- grazing by domestic stock, rabbits, goats and feral animals.

The delivery of ecologically sustainable forest management requires the elimination or control of these and other threatening processes on public and private tenures.

Fox and cat predation affects all tenures including national parks, but it is most severe in cleared and semi-cleared agricultural lands where there are rabbits, the interfaces between cleared agricultural land and national parks, and open forests in national parks and State forests with a sparse understorey (due to frequent burning and grazing) with low cover from predators.

Australia has lost more species of mammal than any other continent and this decline is due largely to predation by foxes and cats. Historically, mammal decline and extinction in Australia has been attributed to a wide range of other causes including habitat clearing, disease, grazing, desertification and altered fire regimes, but none of these theories has been widely accepted or withstood the test of time. The role of fox and cat predation has been confirmed in recent years by a combination of pattern analysis, experiment, and monitoring. Pattern analyses have shown that extinction and decline are highest where there are large populations of foxes and cats, sustained by introduced rabbits or mice, and lowest in areas where foxes and cats are scarce or absent (for example, offshore islands and dense, wet forest) and dingos are abundant (regardless of grazing history, desertification and other land uses). Most recent attempts to re-introduce mammals to parts of their former range in mainland Australia have failed spectacularly because of fox and cat predation. It is now clear that any attempts to re-introduce threatened mammals will be costly failures unless accompanied by effective fox and cat control.

The Western Australian Government had sufficient confidence in predictions that fox predation is the primary cause of mammal decline to initiate

widespread fox baiting in south-west Western Australia. This has led to an increase in the population of threatened mammals and appears to have rescued the numbat from the brink of extinction. Fox control is likely to be more difficult and costly in eastern Australia because widespread aerial 1080 baiting cannot be used. It can poison native quolls and other carnivores and in time foxes may learn to avoid the baits. However, alternative methods are available and it is time that the importance of a strategic approach to fox and cat control in New South Wales was recognised and acted on, regardless of the difficulty and assumed expense.

Clearing is a major threat to rare and poorly known species, particularly plants and fragmented populations in urban and agricultural remnants. It is also probably the most significant threat to rare plants and a threat to forest remnants in agricultural lands. Up until 1995 clearing in Queensland and New South Wales removed about 200,000 ha of woodland/forest per annum, or 2 per cent of the remaining area. Australia is estimated to be the eighth largest clearer of native vegetation in the world.

Loss of tree hollows and old-growth components required by a large proportion of native fauna is caused by timber harvesting on short rotations. Tree hollows are required by approximately 70 species of vertebrates in north-east New South Wales forests including 92 per cent of arboreal mammals, 24 per cent of birds, 62 per cent of bats and 14 per cent of reptiles. The aftermath of recent wildfires has shown that even species such as the koala, thought not to depend on tree hollows, may use and depend on them to survive hot fires. Loss of tree hollows is relatively easily controlled by retaining large old trees with hollows (habitat trees) and a proportion of old growth in logged forests, but even this control measure is not guaranteed, under current management systems, on private forest or agricultural land.

Grazing by domestic stock, rabbits and other feral animals poses a direct threat to some populations of rare plants and compounds the adverse effects of frequent burning and predation by foxes and cats on public and private lands. Frequent burning reduces the forest understorey cover and complexity. This increases the risk of predation and threatens rare plants which depend on infrequent, hot, fire regimes. The diversity of birds which inhabit the forest understorey may be two to three times lower in frequently burnt forest. In the selectively logged forests of north-east New South Wales (those with enough retained tree hollows) it has been estimated that the adverse effects of grazing and frequent burning on biodiversity are up to 15 times higher than the effects of timber harvesting.

Threat abatement has been under-emphasised and underrated in New South Wales policy, legislation and practice. Only one of the five recognised major threatening processes (loss of habitat trees in logged forest) is well controlled under current legislation, and this only on public land. Clearing impacts on threatened species are moderately well regulated on agricultural land through the provisions of the *Native Vegetation Conservation Act 1997* and the Rural Lands Protection Act, but control on private residential land is weakened by the limitations of the 8 point test process under the Threatened Species Conservation Act. Fox and cat predation is by far the main threat in all public forest tenures in New South Wales, yet there are no effective, broad-area, mandatory requirements for fox and cat control in national parks or other public lands. Rural Lands Protection Boards (comprising rural ratepayers) may make submissions to the Minister to have foxes and cats declared pests in particular areas under the Rural Lands Protection Act. However, the Rural Lands Protection Act is generally an inappropriate vehicle for controlling foxes and cats in public and most private forests. The Act is primarily intended to control pest animals which adversely affect agricultural values on rural lands. It is of little use for listing animals which adversely affect the local environment. Cats are not designated pests under the Act and foxes are only listed in the Moss Vale district to facilitate a National Parks and Wildlife Service brush-tailed rock wallaby recovery program. In public and private forests, the Act has primarily been used to control dingos and wild dogs when they are a threat to sheep and cattle on adjacent cleared agricultural land. The levels of fox, cat and rabbit control implemented by Rural Land Protection Boards to sustain agricultural production are not adequate to deliver ecologically sustainable forest management in public or private forests. Protection of biodiversity values requires much higher levels of fox and rabbit control and population reduction (preferably eradication) and the reduction or cessation of dingo control. It also requires the establishment of barriers between public forest and cleared agricultural land to prevent constant forest invasion by surplus foxes and cats which multiply on agricultural land.

Fox and cat predation are listed as key threatening processes under the *Commonwealth Endangered Species Conservation Act 1992*. A draft Commonwealth Threat Abatement Plan has been prepared to reduce predation by feral cats, but this is difficult to enforce outside Commonwealth lands. There is a mechanism for listing key threatening processes under the Threatened Species Conservation Act which places an obligation on National Parks and

Wildlife Service to prepare Threat Abatement Plans. To date, no threatening processes have been listed under the Act but nominations have been received for fox predation, invasion by bitou bush, high frequency fire, lantana invasion and rabbit grazing. There is justification for making threat abatement the primary vehicle for managing the recovery of threatened species and maintaining ecologically sustainable forest management.

Recommendation 3.12: Fox and cat predation be listed as a threatening process under the Threatened Species Conservation Act and that threat abatement plans should be prepared to reduce the extent and impact of fox and cat predation, particularly on public lands where conservation is a priority.

A variety of mechanisms are available to reduce the threat from cats and foxes including:

- initiating ongoing, State-wide fox, rabbit and cat control programs in public forests, particularly on boundaries with agricultural land and in manageable areas of high conservation value;
- identifying and protecting in reserves, refuge areas which are free of or have a low density of foxes, cats and other exotic pests;
- increase dingo populations in public forest to actively reduce the abundance of foxes and cats in priority areas, and slow or prevent the invasion of forests by foxes, cats and rabbits from agricultural land.
- facilitate dingo population increase by use of such methods as: exclusion fencing instead of baiting to control dingos in high risk areas on the boundary between public forest and cleared private agricultural land; restricting baiting and trapping to local areas of sustained stock attack; or stopping control and compensating landholders for any loss;
- manipulating habitat by minimising frequent burning in national parks and reducing the extent of frequent burning in state forest reserves so as to reduce their suitability for cats, foxes and rabbits;
- eradicating cats, rabbits and foxes from islands;
- continuous trapping and baiting of cats in key threatened species' habitats.

Some fox control is carried out by National Parks and Wildlife Service, State Forests of New South Wales and Rural Lands Protection Boards, but no single government agency is responsible across all tenures for controlling foxes and cats. The National Parks and Wildlife Service lacks the resources for blanket

fox control and so limits control activities to special projects areas. The National Parks and Wildlife Service has localised feral animal and weed control programs which cover the control of foxes, rabbits, cats, wild dogs, feral pigs, feral goats, deer, bitou bush and other weeds. However, the overall scale of operation is small compared with the magnitude of the problem and there appears to be little or no monitoring of the effectiveness of control measures and changes in the extent of the problem.

1080 baits, particularly aerial baits, are used to kill dingos in and on the boundary of national parks and public forests even though this practice is known to kill non-target fauna including the threatened Tiger Quoll. Removal of dingos is also thought have a detrimental effect on threatened species by allowing exotic predators such as foxes and cats to increase in number. Surveys have shown that threatened species vulnerable to fox predation survive best in native forests with an abundance of dingos. Under ecologically sustainable forest management, all possible steps should be taken to sustain natural densities of dingos (and dingos which have hybridised with wild dogs) in public forest, especially where they are currently low, to assist with the control of exotic predators and pests (for example, goats).

The Rural Lands Protection Act may conflict with the objectives of ecologically sustainable forest management and the Threatened Species Conservation Act in requiring landholders to suppress and destroy wild dogs, including dingos, in public forest. This fails to recognise the important ecological role played by dingos in the maintenance of forest ecosystems and biodiversity. Dingo populations are common in the forests of north-east New South Wales where their presence has been attributed to the suppression of foxes, cats and goats, resulting in indirect protection for a range of threatened species. This phenomenon is recognised in the Commonwealth Draft Threat Abatement Plan for predation by feral cats, although that plan fails to note the possible conflict with the objectives of the Rural Lands Protection Act and to recommend ways of rectifying that problem.

The overall aim of pest management in forests should be to sustain dingo populations at natural densities. The north-east forests are the most biodiverse in New South Wales and the only public and private forests with a pristine or near pristine (pre-European) fauna. That has been attributed to the presence of dingos and the scarcity of foxes and cats. Any reduction in dingo populations in northern forests through further wild dog control and agricultural expansion could lead to the decline and even extinction of this

regionally endemic mammal species. Similarly, the recovery of dingo populations in south-east forests and any concomitant decline in foxes and cats may facilitate the recovery of species such as the Long-footed Potoroo. If the maintenance and enhancement of dingo populations is found to facilitate the protection and recovery of threatened species by controlling foxes and cats, this approach could be one of the most cost-effective methods of fox, cat and goat control.

Recommendation 3.13. The potential conflict between the objects of the Rural Lands Protection Act and ecologically sustainable forest management principle 1 be removed to ensure the protection and maintenance of dingo populations in public forests.

This could be achieved by exempting public forests from the requirements of the Rural Lands Protection Act within a specified distance from their boundaries with cleared agricultural land. Future regional vegetation management plans should identify the interface between cleared agricultural land and public forest as a zone requiring special management for the control of vertebrate pest species.

State Forests of New South Wales has initiated routine fox baiting and cat trapping (as required under the Conservation Protocols) in the Eden RFA region which is funded by income from woodchipping. Rural Lands Protection Boards may carry out some fox control on agricultural land, the boundary of public forests and some national parks under contract to the National Parks and Wildlife Service. However, the overall scope of fox control is far short of what is necessary to achieve widespread recovery of threatened fauna.

It is recommended that a single threat abatement unit be created to develop and implement regional cross-tenure threat-abatement plans and to implement threatened species Recovery Plans. A single threat abatement unit is necessary to:

- ensure consistency in resources for the control of introduced pests and other threatening processes across tenures;
- develop and coordinate approaches to the protection and management of threatened species, populations and communities on private lands;
- coordinate cross-tenure approaches to mitigating cumulative impacts and to monitor threatening processes and the effectiveness of control measures on a regional basis.

It is envisaged that the threat abatement unit would include and expand many of the functions currently

undertaken by National Parks and Wildlife Service zone teams.

Recommendation 3.14: A Threat Abatement Unit should be created to develop regional cross-tenure threat abatement plans (to counter significant threatening processes) and to implement Recovery Plans for threatened species.

Emphasis should be on greatly improved resources for the control of foxes, cats, other feral animals and weeds, grazing, inappropriate burning regimes and other threatening processes. The Threat Abatement Support Unit should also provide assistance and advice to private landholders in the control of threatening processes and the implementation of species Recovery Plans on private land. Regional fox and cat control can lead to improvement in threatened species abundance, as shown in Western Australia, but only with a greatly increased commitment of resources.

Recommendation 3.15: Current resourcing for threat abatement, particularly fox and cat control, be increased substantially (for example, by an order of magnitude).

Many threatened species vulnerable to fox and cat predation are now confined to 'refuge' areas where the risk of predation is low. These areas include the moist escarpment forests with a dense understorey scattered along the escarpment of the Great Divide, the coastal heaths and most of the areas of north-east New South Wales that have a natural forest cover. The areas are also distant from large expanses of cleared agricultural land and support good dingo populations. Current proposals to deliver ecologically sustainable forest management through a representative CAR reserve system and complementary off-reserve management cannot guarantee effectiveness because refuge areas may not be adequately protected in the CAR reserve selection process and there is no mandatory on-reserve or off-reserve control of foxes and cats. Emphasis on achieving 15 per cent targets for all communities in the CAR reserves may increase the representation of drier forest types, which are generally infested with foxes and cats, at the expense of moist productive old growth which generally has few foxes and cats and abundant diversity of threatened species. The current CAR reserve selection processes do not appear to give sufficient consideration to off-reserve conservation and on-reserve threats from processes such as predation and fire. Modelling and mapping refuge areas where the risk of predation by foxes and cats is low should be a

priority for the proposed State-wide threat abatement unit.

The adverse effects of fox and cat predation are aggravated by the frequent control burning of understorey in State forests and national parks to reduce the risk of wildfire. Wildfire is a natural process in Australian forests. It sustains fire-dependent plants, controls insect pests and diseases, and initiates the natural seral changes favoured by some native fauna and flora. Graziers' burning practices in State forests and the frequent control burning in State forests and on private lands, substantially conflict with the objectives of the Threatened Species Conservation Act and may preclude the delivery of ecologically sustainable forest management. The *Rural Fires Act 1997* requires that consideration be given to threatened fauna requirements, but fear of prosecution from neighbours combined with the desire to exclude wildfire from wood production forests ensures that a high proportion of public and private forest is subject to inappropriate fire regimes. The frequency of unregulated fire could be lessened by revoking grazing licences (where possible) in public forests except where approved grazing management plans are in place. As well as promoting frequent burning, (to produce green pick for cattle) forest grazing has the added disadvantage of being more constant, uniform and widespread in effect than fire and of affecting forest understorey in moist gullies and refuge areas which normally have some natural protection from frequent fire.

National Parks and Wildlife Service has a statutory responsibility under the Threatened Species Conservation Act to prepare recovery plans for approximately 40 species per year over the next three years. The obligation to produce a large number of species recovery plans in a very short period is detracting from the real task of controlling threatening processes. Effective control of these would eliminate the need for most individual species recovery plans. The majority of species at risk are threatened by a small number of factors including feral animals, clearing on private land, and frequent burning and grazing.

Until effective procedures for dealing with these problems have been resolved and implemented across all public and private tenures, the preparation of individual recovery plans will involve considerable duplication and expenditure of resources with little or no improvement in species conservation status above the current levels.

Recovery Plans risk becoming little more than expensive summaries of current knowledge attached

to funding wish-lists, with little guarantee of delivering improvements in threatened species' status. The effectiveness of Recovery Plans is blunted by the lack of political will to enforce protection measures on private lands and in National Parks and Wildlife Service's lack of authority by imposing management constraints on other public land-management authorities without approval or involvement of stakeholders in a process of consensus. At present, officers of National Parks and Wildlife Service have no authority to enter private land for the purpose of threatened species survey and management. This is a significant impediment to the recovery of threatened species on private land.

Recommendation 3.16: That current legislation be modified to enable officers of National Parks and Wildlife Service to enter private land for the purpose of threatened species' survey and management.

As most threatened species are distributed across a wide range of tenures, cross-tenure management issues are a key factor in recovery management. Recovery plans are only as effective as the current legislation and the policy on clearing, predation, frequent burning, loss of habitat trees and other threatening processes.

Recommendation 3.17: Threat abatement plans must be prepared for all recognised major threatening processes (including fox and cat predation, clearing on private land, loss of tree hollows, grazing, frequent burning, weed invasion and disturbance by exotic animals) as a matter of urgency (within three years). These plans should be prepared prior to or concurrently with recovery plans prepared for individual threatened species significantly affected by these processes. Recovery plans should be prepared for groups of threatened species affected by common threatening processes and prioritised according to extinction risk. Consideration should be given to extending completion dates for individual recovery plans for threatened species at low risk.

In the short term, while threat abatement plans are in preparation, it would be appropriate to focus on arranging threatened species into groups affected by common processes and prioritising them and individual species according to risk and recovery opportunity. Instead of preparing 120 individual recovery plans, it would be more appropriate to prepare a greatly reduced number of plans for large groups of species threatened by common processes such as fox predation, cat predation, clearing, loss of

tree hollows and old growth in State forests, grazing, and frequent burning.

Codes of practice

Codes of operational practice provide an important element supporting the achievement of ecologically sustainable forest management. The expert working group did not formally review the scientific basis of codes of practice and related protocols operating in New South Wales forests. Rather, it considered the effectiveness of the systems used to implement these codes and their coverage.

Departmental roles and responsibilities

The National Forest Policy Statement includes a general requirement for the development of codes of practice to protect environmental values by regulating the level and type of disturbance acceptable in particular forests. Apart from this, there is no statutory process or obligation to develop codes but all land management agencies should be encouraged to develop their own codes of practice in consultation with National Parks and Wildlife Service to achieve effective compliance with policy and legislation processes.

The Department of Urban Affairs and Planning, when determining state forest environmental impact statements, takes guidance from the National Parks and Wildlife Service and independent experts to set the conditions for minimising impacts. The Department of Urban Affairs and Planning has also recently developed, in cooperation with other departments, a Code of Practice for private plantations (Timber Plantations 'Environment Protection' Harvesting Code 1997). Owners who wish to bring their plantations under the provisions of the *Timber Plantation (Harvest Guarantee) Act 1995*, must obtain accreditation and subsequently manage according to this Harvesting Code.

The Environment Protection Authority is responsible for regulating pollution in streams and rivers across all tenures by issuing licences to pollute, but the Department of Land and Water Conservation is responsible for water quality monitoring and licensing water offtake. The Department of Land and Water Conservation issues licences that limit water offtake below the 90th percentile of the lowest flow, leaving some water for environmental flows. The Environment Protection Authority is moving towards pollution prevention rather than control, by guiding rather than prosecuting and by using performance

objectives in licences rather than strict prescriptions. The Environment Protection Authority can direct other agencies to apply best practice management to minimise impacts on other values, including biodiversity, soil, air and water, but its current effort is largely confined to pollution control.

The National Parks and Wildlife Service has developed agreed 'conservation protocols' for the regulation of forestry activities in public forests, but these have not been extended to the regulation of timber harvesting in private forests. The National Parks and Wildlife Service collaborated with the Department of Land and Water Conservation in developing clearing guidelines for the Western Division but has not developed clearing guidelines for other regions or activities on private land.

State Forests of New South Wales have developed codes of practice to provide guidance to employees and contractors working in State forests and rules and procedures to be followed to minimise environmental impacts. The codes, published in four parts, cover operations in native and plantation forests, road and track maintenance, and plantation establishment. Requirements to observe the codes are contained in several operating licences held by State Forests of New South Wales (for example, Pollution Control Licence). The agency has developed internal procedures for assessing compliance including an internal audit function (discussed in Appendix A). State Forests of New South Wales have also developed and implemented accredited training courses for operators, supervisors and forest planners in relation to the soil and water protection procedures contained in these codes and licences.

The Department of Land and Water Conservation has developed codes of practice for clearing and forestry on Protected Lands but not for activities affecting crown land. These lands, including road reserves and travelling stock routes, have an important conservation role in the Central Division. The Department of Land and Water Conservation forestry protocols differ from those of the National Parks and Wildlife Service in not requiring pre-logging surveys for threatened and sensitive flora and fauna, but compensate for this by restricting harvesting intensity to lower levels than in public forests. However, since current Department of Land and Water Conservation protocols do not specify minimum rotation times, landholders may circumvent the intent of the

harvesting intensity protocols by re-logging the forest after a short time.

Assessment of Requirements for Effective Codes of Practice systems

Codes of practice contain the methods and practices necessary to ensure that environmental impacts caused by workplace activities are minimised or eliminated. They are usually written to guide operational activities rather than for long-term planning or other activities. They are usefully supported by more detailed information in the form of field guides and manuals. Codes usually contain a requirement to monitor particular activities and outcomes and are themselves subject to an audit to ensure that they are complied with. Aspects that contribute to the success of codes of practice include the following:

- Since codes relate primarily to field activity, they should be written in a style suitable for their primary audience, (forest workers and operators), rather than in a legal style aimed at supporting enforcement.
- Guidelines for activities must be sufficiently detailed to provide clear guidance on methods and practices (for example, for site assessment) and in some cases may refer to associated management prescriptions, field guides or manuals that provide relevant instructions.
- Codes require an extensive process of education and/or training when they are introduced. There is also a need for ongoing practical involvement and periodic refresher training for those who implement the codes.
- There is a trade-off between the complexity of procedures and the degree of success in implementation procedures. Many important operational decisions must be made on the spot by operators in situations where a subsequent follow-up is not readily possible. Recognition that codes are part of a system involving procedures, operators, supervisors, and auditors and not simply a stand-alone document is important. There must be a high degree of support and ownership of procedures by operators. Procedures and processes must therefore be practical and capable of ready implementation.
- Acceptance also depends on competent and consistent supervision and audit for compliance, clear procedures for handling non-compliance, or complaints; and, where necessary imposition of sanctions.

- Codes require regular updating because of new knowledge or because of continual improvement in the operational capability of equipment.
- There is also a need for ongoing research to verify the effectiveness of the best management practices applied in achieving environmental protection. This can be achieved by a combination of monitoring environmental outcomes and targeted research which is often more cost-effective. Because most Code systems are still new, many procedures were developed to be precautionary. Research can play a vital role in refining more cost-effective procedures.

State Forests of New South Wales have already developed several important codes for the harvesting and management of public production forests. These codes meet many of the criteria listed above. A parallel code and support system should be developed for those aspects of the operations of the National Parks and Wildlife Service that affect the environment, such as fire management and road and track construction and maintenance.

There is an urgent need to develop a functional code system to support the improvement of forest operations (including clearing) on private land.

Significant resources must also be allocated to the development of codes and their effective implementation on the ground.

Recommendation 3.18: Application of effective codes of practice to guide planning and operations is critical to achieving ecologically sustainable forest management, but currently codes are only applied in a significant way in public wood production forests.

The role of codes of practice in supporting the implementation of ecologically sustainable forest management in New South Wales should be expanded by:

- developing and approving legally binding codes to address all important activities across all land tenures in New South Wales forests, including wood production, conservation reserve management, grazing, pest management and clearing.
- ensuring that such codes contain sufficient detail to guide protection of environmental values at appropriate scales;
- providing adequate resources to expedite the development of such codes and their effective implementation in forested areas;
- implementing codes within the framework of an environmental management system in public forests to facilitate:

- agencies and organisations implementing codes to demonstrate compliance with codes through independent means;
- regular public review processes to ensure that codes reflect continual improvement and best-practice concepts.

Biodiversity Codes

Development and specification of amelioration measures for mitigating biodiversity impacts is a routine step in the process of impact assessment. For certain classes of major activity, where impacts are relatively well understood as a result of extensive prior impact assessment (for example in public forestry), it is possible to develop standardised amelioration measures (referred to as conservation protocols in public forestry) which can be routinely applied to prevent significant impacts and thus provide a mechanism for reducing the duration and cost of development approval.

In order to be effective in the delivery of ecologically sustainable forest management, codes should:

- include pre-development survey for species of rare flora and fauna that require special amelioration measures if present;
- include precautionary protection measures for all individual threatened species or groups of species that could be present and that are known to be sensitive to the development;
- aim to maintain biodiversity and environmental values at specified target levels (which may be at sustainable but lower than natural levels);
- be monitored to ensure compliance and effectiveness.

Recommendation 3.19: As some codes of practice and conservation protocols are necessarily precautionary at the present time, codes should be subject to ongoing fine tuning and regional modification on the basis of independent expert advice and the results of new research. Any changes to codes of practice should flow through to Conditions of Consent for approved activities and this should be the preferred mechanism for progressive refinement and modification of environmental protection standards rather than undertaking new environmental impact statements and species impact statements at regular intervals.

Codes of practice for the regulation and planning of habitat clearing should be quite separate from those designed to regulate habitat modification (for

example, by forestry). Habitat clearing requires greater attention to corridors and links, minimum targets for the size of remnants, edge management, and partial clearing trade-offs as a solution to compensation for financial loss. Minimum clearing constraints on private land are an inescapable requirement for the delivery of ecologically sustainable forest management in the Central Division of New South Wales because public land for conservation is scarce.

Recommendation 3.20: A code of practice be developed for the regulation of clearing on all tenures including residential lands, and the codes specify minimum levels of vegetation retention and provide guidelines for the maintenance of corridors and links.

The basic principle underlying clearing protocols should be a reversal of past clearing patterns. Instead of clearing leading to create vegetation fragments in a matrix of cleared land, codes should ensure the creation of fragments of cleared land in a matrix of continuous natural vegetation through a combination of retention and restoration where possible. A set of basic clearing design rules should be developed to ensure that there is no fragmentation and isolation of remnants and that retained vegetation is contiguous across property boundaries.

The use of performance measures for licensing pollution rather than applying minimum prescriptions (for example, vegetation buffers for protection of streams in logged forests) is relatively untested and potentially costly and difficult to implement and enforce, because performance criteria will be site-specific whereas prescriptions can be more generic. It would be more appropriate to have an iterative combination of the two approaches in the following sequence:

- application of precautionary minimum prescriptions;
- monitoring of performance in relation to targets;
- correlation of prescriptions and outcomes; and
- review of precautionary prescriptions.

This approach would require the cooperation of all water management agencies (Department of Land and Water Conservation, Environment Protection Authority and Department of Fisheries) or the creation of a single freshwater management agency.

Problems in delivery of ecologically sustainable forest management

Forest managers (notably State Forests of New South Wales) working with regulatory agencies,

have implemented a number of licences, protocols and codes of practice together with compliance and audit procedures for field forestry operations in New South Wales. Most of these have well-developed support systems (see Appendix A).

However, some important deficiencies and problems remain, including the following:

- The coverage of codes of practice is incomplete. Further codes are needed, for example, for reserve management, private forestry, clearing etc.
- There are clear inconsistencies in the application of codes, licences and protocols between public and private tenures.
- There are overlapping or multiple responsibilities for the regulation of performance in relation to some ecologically sustainable forest management principles, and regulatory requirements replace or overlap conditions in codes. This can lead to confusion in application of codes and procedures required to conform to regulations by field personnel.
- There is a lack of guidance for those developing codes, as to the appropriate degree of environmental protection required. Codes, licences and protocols typically focus on a specific component of ecologically sustainable forest management. However, the proposed rules or procedures usually affect a number of such principles. Improved procedures are required to ensure that all relevant aspects of ecologically sustainable forest management are considered, particularly where there are clear interactions between values such as in the selection of 'best practice' procedures.
- The current focus of many of the codes is State-wide, although some of the licences and protocols are regional or location-specific. There is a need to introduce further mechanisms for local adaptation of State-wide codes, to ensure local effectiveness and to avoid the consequences of over-precautionary guidelines set to cover 'worst case' scenarios. A greater reliance on monitoring and analysis of environmental results, and direct feedback to improve prescriptions should lead to more flexibility and reduced emphasis on State-wide rules.

Too many agencies are involved in the regulation of environmental impacts and the development of conservation protocols. Four government departments have been involved in developing conservation protocols for State Forest land and

two separate regulatory processes affect the application of stream protection buffers in State forests.

Lack of guidance in determining the balance between conservation and development goals for public forestry is the fundamental cause of conflict with the conservation movement. Management of public forestry is now largely regulated by decisions of the National Parks and Wildlife Service, the Environment Protection Authority, Department of Urban Affairs and Planning, and decisions from the Land and Environment Court. While some of the larger issues should be resolved through the RFA processes, there will be an ongoing need to resolve questions about the relative weighting of ecologically sustainable forest management values in the assessment of the potential impact of practices, and the drafting of codes. It is recommended that codes and related prescriptions should be approved by a forest regulator, that would ensure a balance is achieved according to ecologically sustainable forest management principles.

Current state forest conservation protocols are generic and designed to provide a precautionary approach to conservation. They may be unnecessarily precautionary at some regional and local scales. There is a need and opportunity for greater fine tuning of prescriptions (for example, habitat tree retention prescriptions) to accommodate local site variation. This could be achieved by developing expert systems to direct the modification of prescriptions under particular regional circumstances, much as has been proposed for the soil erosion hazard prediction components of the Pollution Control Licences. There are also significant advantages in the application of an approach by the managing agency, with a greater emphasis on environmental monitoring, analysis and direct feedback to revision of procedures. There is less need for extensive, externally regulated codes of practice where effective environmental management can be demonstrated.

Bioregional planning for ESFM

Bioregional planning for ecologically sustainable forest management involves the following:

- survey, classification and mapping of natural communities, species' habitats and populations;

- assessment of the conservation status of remnant communities by consideration of such matters as condition, size, location, connectivity, refuge from fire and predators, and representation in existing reserves;
- regional zoning for a range of uses including the following:
 - conservation reserves
 - retained areas off-reserve
 - sustainable forestry
 - clearing or modification with development consent
 - clearing or modification without development consent

A prerequisite for ecologically sustainable forest management is the delivery of a State-wide, comprehensive, adequate and representative conservation reserve system. A comprehensive and representative reserve system is one which protects examples of all forest communities in New South Wales. An adequate reserve system is one with features such as good condition, security from threatening processes, large size, replication and connectivity. These will help to ensure the long-term viability of representative communities.

The National Parks and Wildlife Service has a statutory responsibility under the *National Parks and Wildlife Act 1974* to investigate and acquire new areas for inclusion in parks and reserves. Although there is no specific requirement under this act to deliver a 'comprehensive, adequate and representative' reserve system, this goal is understood within the Service's overall responsibility for nature conservation throughout New South Wales. Historically, acquisition of new areas for national park in New South Wales has largely been confined to leftover public land because of the lack of financial resources to buy areas of high conservation value on private land. The principal problem facing government in the delivery of a reserve system is how to protect and maintain high conservation value areas on private land until they can be acquired for the public reserve estate.

Under the Environmental Planning and Assessment Act, the National Parks and Wildlife Service has a statutory consultative role to advise the Director General of the Department of Urban Affairs and Planning on matters relating to the zoning for protection of biodiversity during the preparation of state environmental planning policies (SEPPs) and regional environment plans (REPs); and to advise

local councils in the preparation of local environment plans (LEPS) and local environmental studies (if, in the opinion of the council, threatened species may be affected by such plans or studies). This mechanism offers the greatest potential for off-reserve bioregional planning and the delivery of ecologically sustainable forest management goals. Regional or strategic approaches to land-use planning overcome the problem of cumulative habitat loss (the tyranny of small decisions) that arises when development applications are considered on an individual project basis (as under the assessment provisions of the Threatened Species Conservation Act). Regional planning can also reduce the cost of compliance by confining environmental assessments to those areas (zones) where they are most needed. This approach is adopted by some map-based State environmental planning policies (for example, wetlands and littoral rainforest). There is scope for the development of a new map-based SEPP for regulating the clearing and development of forest remnants on urban and residential land. The current SEPP 19 for protecting Bushland in Urban Areas is designed to protect urban bushland remnants zoned as open space. It does not guarantee the delivery of ecologically sustainable forest management because it is not based on mapped areas of conservation significance and does not include minimum regional targets for bushland retention. Some Local Government Areas have tree preservation orders or local environment plans which include provision for the retention and management of trees and which could be adapted to deliver ecologically sustainable forest management biodiversity goals in urban areas.

Clearing in residential areas is not covered by the Native Vegetation Conservation Act but can be regulated by local environment plans and is regulated on a project basis by the provisions of the Threatened Species Conservation Act. Over the long term, it would be more appropriate to replace project-based assessment with bioregional conservation planning through progressive survey, mapping and classification of all forest and natural vegetation remnants in residential areas, and by re-zoning under regional vegetation management plans and local environment plans, to provide appropriate protection to areas of conservation significance, corridors and links. Current legislation under the National Parks and Wildlife Act allows powers of entry to any premises for the purposes of 'identifying and mapping critical habitat, and... investigating the presence or condition of threatened species, populations or ecological communities and their habitats'. These powers do not permit more general surveys for effective bioregional planning and may need to be broadened to allow access by officers of

the Department of Land and water Conservation and the National Parks and Wildlife Service to carry out bioregional surveys on private land for conservation planning purposes. In the interim, it will be necessary to retain the 8 point test and to modify the interpretation of it to give more emphasis to the assessment of cumulative impacts and the maintenance of regional reservation targets.

Cumulative habitat loss is a major problem not adequately covered by current project-based planning and assessment. This leaves the door open for progressive approval of many small developments, each too small to be significant in their own right but which collectively may remove entire communities or habitat remnants. This is a particular problem in private agricultural and urban lands. A two-hectare interim exemption on agricultural land under the Native Vegetation Conservation Act leaves scope for progressive habitat clearing at the property scale.

Recommendation 3.21: The 8 point test be modified to include provision for assessment of cumulative impacts and consideration of regional targets for vegetation retention.

Cumulative impacts can be overcome by either:

- comprehensive regional biodiversity survey and planning which identifies and protects all significant areas by zoning (for example, under regional vegetation management plans, local environment plans and regional environment plans); or
- setting maximum allowable limits for cumulative community or habitat loss where developments are assessed on an individual or piecemeal basis.

At present there are no private and few public regions with set targets for vegetation retention. The Department of Land and Water Conservation has set maximum allowable limits (targets) for the removal of particular communities by clearing and development on public lands in the Western Division of New South Wales. These limits take into account land suitability (mainly grazing of natural pasture), regional variation in the conservation significance of different communities, and the degree of previous clearing of these communities elsewhere in New South Wales. A maximum clearing limit of 5 per cent applies to Bimble Box Pine Lands because this type has been extensively cleared in the adjacent Central Division of New South Wales. Similar maximum allowable cumulative targets are required for urban bushland remnants and agricultural remnants on freehold lands.

This modification may only be necessary as an interim measure before the completion of State-wide

regional vegetation management plans. Strategic planning is the best long-term solution to the management of cumulative impact but, in the interim, some modification of the project-based assessment and approval mechanism is necessary. To date, regional planning approaches to the delivery of ecologically sustainable forest management off-reserve have been constrained by:

- a lack of comprehensive regional environmental (bio-physical, cultural heritage) survey data;
- a lack of guidelines and standards or targets for interpreting biodiversity patterns, mapping zones of conservation significance, and for achieving ecologically sustainable forest management goals;
- a lack of resources for revising existing local environment plans and regional environment plans; and
- a lack of clear legislative responsibility for setting reservation targets.

Detailed information on vegetation communities needs to be prepared by the National Parks and Wildlife Service or the proposed new forest information unit. In the first instance, material generated through the CRA process should be captured. Further work will be required to improve the coverage of information on private land. Additional scientific and technical expertise may also be required for the effective working of these committees. This role should be fulfilled by the proposed information and research units (see key recommendations 1 and 11).

Recommendation 3.22: The current system of project-based assessment and approval for private forests should be replaced by one based on:

- regional (cross-tenure) land use planning (for example, regional vegetation management plans);
- preparation of a private forest management plan;
- use of codes of practice for all significant activities within each planning zone;
- preparing private forestry management plans, where forestry is proposed on specific sites;
- enhanced monitoring by the forest manager; and
- periodic review of the private forest management plan and its outcomes in terms of ecological sustainability, undertaken by the forest regulator.

Existing national parks and reserves are highly fragmented and isolated by cleared land, or dispersed in a matrix of variously modified private and public forest. Little consideration has been given to the planning and management of corridors between parks, reserves and retained areas on a State-wide scale to facilitate flora and fauna dispersal and genetic exchange. The failure to consider ecologically sustainable forest management connectivity goals on a State-wide basis can be attributed to the fact that there is no single government agency charged with the responsibility for coordinating land-use across all tenures in New South Wales. At present no agency can compel another to adopt contiguous and sympathetic zoning across tenure boundaries. There is scope for the dedication of corridors and links between national parks and reserves where they are connected by public lands such as state forest, crown land and road reserves. The Department of Urban Affairs and Planning has, for example, through its statutory powers to determine state forest environmental impact statements, recommended the establishment of a retained habitat link between coastal and inland national parks in the Eden region where timber harvesting will be modified to facilitate the movement and dispersal of fauna. This concept should be extended to all land tenures.

Recommendation 3.23: Coordinated cross-tenure plans for habitat corridors and links across all private and public tenures should be developed.

Plans should be prepared according to strict guidelines which include the points made in recommendations 3.24, 3.25 and 3.26.

Recommendation 3.24: The development of a regional approach to private forest management based on regional vegetation management plans and private forest management plans should be expedited. Improved vegetation management plans should use information derived from comprehensive regional environmental surveys that take into account the conservation status of forest ecosystems across all tenures and consider such elements as biodiversity, soil, water and cultural heritage. The vegetation plans must also acknowledge the fundamental distinction between clearing for agricultural and residential purposes and sustainable native forest management.

Committees preparing regional vegetation management plans must possess adequate technical expertise in relation to the science/practices involved in ecologically sustainable forest management. Processes to effectively capture relevant information need to be developed.

In terms of the forest resource, regional vegetation management plans must:

- assess effects of management practices on individual forest values at an appropriate scale, which may be larger or smaller than the area covered by the plan, when setting zone boundaries;
- include minimum targets consistent with regional determination of the comprehensive, adequate and representative (CAR) reserve system for retention of forest cover;
- indicate specific zones and procedures essential to meet CAR reservation targets for forest communities that are inadequately protected on public land;
- maintain or increase the values related to ecologically sustainable forest management above regional targets;
- identify areas of forest suitable for restoration;
- contain a requirement for monitoring compliance with plans;
- include coordinated cross-tenure plans for habitat corridors and links in and between forests across all tenures; and
- involve landholders at an early stage in the planning process.

Private forest management plans should be prepared according to strict guidelines that:

- include systematic vegetation, habitat and fauna surveys as a foundation for planning;
- implement standardised 'clearing codes' to maintain forest connectivity across tenures;
- maximise opportunities for development trade-offs in urban areas as an incentive for conservation.

Recommendation 3.25: Private forest management plans and threat abatement plans should be prepared to an approved standard and approved by the forest regulator.

Recommendation 3.26: Compulsory codes of practice designed to achieve sustainable management of private native forests must be put in place. An appropriate vehicle would be a State environmental planning policy.

Principles 1B and 1C: Ecological sustainability of forest ecosystems

Ecologically sustainable forest management Principles 1B and 1C seek in an integrated way to maintain productive, healthy and dynamic ecosystems. While of particular relevance to the delivery of ecologically sustainable forest management within the wood-production forest, the principles will also be important in the management of nature reserves where these are affected by historical disturbances (logging, fire) and require some level of restoration.

Ecologically sustainable forest management Principle 1B will be achieved where there is optimum site production. This requires that account be taken of ecosystem processes which (i) maintain the health and productivity of the forest, for example, through disturbances which help to maintain a stratum of understorey species able to contribute to soil improvement and fauna habitat; (ii) maintain full site regeneration following harvesting – often dependent on seedbeds created by fire or mechanical soil disturbance; and (iii) maintain the dynamic growth of trees to maturity – requiring an appreciation of the effect of site factors on the competitive ability of species, the need for the periodic creation of canopy gaps of appropriate size, and where necessary, periodic release of regrowth from over-wood competition.

Ecologically sustainable forest management Principle 1C places constraints on the level or intensity of activities within the forest in pursuing optimum site production. For any given ecosystem it will be necessary to have some appreciation of that point beyond which disturbance to the ecosystem will begin to have adverse effects on forest productivity, health and vitality and its susceptibility to pests and diseases. For example:

- Given the sensitive relationship between species and community patterns on the one hand, and the availability of site resources on the other, the maintenance of natural species mixtures and structures could be important in ensuring a healthy balance between those resources and the demand the forest makes on them. This could be particularly important where site resources (notably water and nutrients) are limited.
- Loss of ecosystem nutrients following an intense slash fire may not be balanced by nutrient inputs during the subsequent rotation or logging cycle, particularly on sites of low to moderate quality. In this case the need to conserve nutrients may restrict silvicultural and harvesting regimes.
- Threats to ecosystems from pests and diseases often, though not always, arise where species patterns, stand structures and ecological processes are no longer in balance with site resources. The achievement of ecologically sustainable forest management may depend on the restoration of the appropriate suite of attributes where the forest has been degraded, and its productivity, health and vitality have been adversely affected.

A detailed discussion of ecologically sustainable silviculture is beyond the scope of a report focusing on management systems and processes. However, the concepts bearing on sustainable silviculture are discussed in *Ecology and Silviculture of the Eucalypt Forests* (Florence 1996), and particularly in Chapter 14 (pp. 343-377). This explores the effects of harvesting on species and community patterns and ecosystem processes, the effect of harvesting and fire on forest soils (focusing particularly on soil nutrients), the susceptibility of forest and woodland trees to stand stagnation and dieback, insect predation, and the conservation of wildlife within the wood production forest. The Group accepts that the principles of ecologically sustainable silviculture examined in this work should be considered in developing silvicultural strategies and practices for the native forests.

The New South Wales forests are in a variable condition. At one end of the spectrum, the forest retains natural species and community patterns, and is near fully stocked and dynamic. At the other end, the forest is generally run down and in a poorly productive condition, and regrowth forest may be in a more or less stagnant condition or may exhibit some level of tree decline and dieback.

Parts of the wet sclerophyll component of the forest have failed to respond adequately to past harvests; there may be inadequate eucalypt regrowth, a dense understorey of wet sclerophyll and rainforest element shrubs, and a serious incursion of exotic species, notably the prolific lantana. Attempts at biological control of lantanas have not succeeded, and site restoration will now depend on progressive site clearing and enrichment planting of species native to the site. This will be an expensive operation and may be planned over several cutting cycles.

The incidence of conspicuous tree decline, or reduction in wood quality, is not widespread in New South Wales forests, but it is serious enough where it occurs (for example, the widespread dieback and death of Sydney blue gum caused by a psyllid and associated pathogens, and the impact of a wood-boring beetle on blackbutt wood quality). In these and other cases, there is a tendency to focus on

specific causal agents (for example, a fungal disease or insect predators), rather than to explore the phenomenon in terms of historical disturbances that may have upset some sensitive community-environment balance and increased the susceptibility of trees to pathogenic organisms or insect predation (see Florence 1996, chapter 14).

There are a number of ways in which this might happen in eucalypt forests. Changes in the frequency of species within mixed species communities (as a consequence of fire, harvesting or cultural activities) may, on specific sites, predispose *Monocalyptus* species to soil pathogens, or *Symphyomyrtus* species to insect predation. Changes in natural fire regimes (notably lengthy fire-free periods) may affect normal nutrient mineralisation processes or alter the balance between favourable and harmful organisms. And reduction in the vegetational or structural complexity of forests can affect the ecosystem 'checks and balances' which help to maintain the productivity, health and vitality of communities.

The expert working group believes that State Forests of New South Wales must not only maintain an effective research response to any forest dieback, but also develop a facility to evaluate possible causes in terms of site and ecosystem functions, and, as far as possible, take remedial action to restore communities to a more or less natural condition.

Despite these comments, the expert working group accepts that, given the ecological and growth attributes of eucalypts for most sites and communities, there can be considerable opportunity to work in harmony with nature. That is, no single silvicultural prescription or set of prescriptions will be solely applicable to any given forest or forest type. Rather, within the bounds set by ecological principles, silvicultural practices may be determined that can deliver different management objectives and priorities, including the balance between wood production and environmental conservation as prescribed in the strategic plan. Given the incorporation of 'long term social and economic benefits' within the ecologically sustainable forest management principles, the trade-off between wood production and environmental values will be one of the critical factors influencing silvicultural decisions.

An evaluation of the extent to which current management systems and processes are able to deliver ecologically sustainable silvicultural practice, must take into account the provisions within strategic and operational plans, current silvicultural and other forest use strategies, and their likely effects on the productivity and ecological stability of forest ecosystems.

Ecologically sustainable yields

Ecologically sustainable forest management Principle 1B requires that the rate of removal of any forest product be consistent with ecologically sustainable levels. This is taken to mean the derivation of yields taking account of all ecologically sustainable forest management principles in forest management, including the precautionary principle. For example, constraints would be placed on *commercial* wood production on resource-limited sites.

Reasonable confidence in the ability to predict future forest growth at spatial points in the landscape as well as saw-log quality (for example, incidence of defect, size of log for individual species), is fundamental to achieving ecologically sustainable forest management. Capacity to do this is currently low in some New South Wales forests. The forest may be characterised by complex species and community patterns, considerable structural and growing stock diversity, and wide variations in the tree growth condition. Earlier policies did not pursue sustained yield harvesting (Chapter 1) and the associated failure to invest in an adequate information base has also contributed to this problem.

These issues are being considered in detail through the assessment of sustainable yield forecasts and methods being undertaken as part of CRA processes.

Recommendation 3.27: The current program of forest inventory, growth plot measurement, and growth modelling should be maintained and improved post-RFA. This is essential in order to achieve the key objective of sustainable wood production. External peer review of systems, and the use of expertise outside State Forests of New South Wales need to be part of ongoing efforts to improve spatial prediction of forest growth, including the effects of contrasting silvicultural practices on long-term forest production.

Area Management Plan and Preferred Management Priorities

The pre-1990s Management Plan was primarily designed to regulate wood production. Regulation of growing stock was based on determination of a sustainable harvest – though the information base for this was often limited, and the process was still influenced by historical levels of cut and commitments to dependent industries. Harvesting tended to be based on a standard silvicultural prescription designed to eke out supply to industry, and little account was taken of the ecological attributes of species, species and community patterns, and structural diversity throughout the forest. While there was an awareness of important ecological,

silvicultural and management concepts relevant to ecologically sustainable practice (as illustrated in the Forestry Commission's 'Silvicultural Notes'), it cannot be said that the Commission was managing 'forest ecosystems' and determining ecologically sustainable yields as required in the ecologically sustainable forest management principles.

A number of more positive approaches to conservation were recorded in management plans from the late 1980s. For example, the 1998 Management Plan for the Kempsey Management Area lists Flora Reserves and Forest Preserves, areas zoned for protection or special management under the preferred management priority system, and plants and animals of particular conservation significance. However, there is no provision to maintain or manage habitat for specified plants and animals, for example, through more specialised silvicultural regimes. Rather, the plan simply argues that, given the prescribed silvicultural practices, the recovery of habitat values is likely to be rapid after logging.

Special Management Areas prescribed within the preferred management priority classification will have most relevance in delivering ecologically sustainable forest management principles where they relate to the conservation of biodiversity and protection of soils and water. However, these areas also offer a special challenge in terms of the criteria for ecologically sustainable silviculture. For example, within Special Emphasis Flora and Fauna zones, the conservation of wildlife habitat may require a particular focus on the residual tree species composition, for both shelter and food, ensuring that the scale and intensity of activities are controlled and benign and, where necessary, maintaining and restoring the attributes of degraded forest.

It may be necessary in delivering ecologically sustainable forest management to prepare special management plans for forest of particular environmental significance. A good example of such a plan is that developed to conserve the koala in Pine Creek State Forest. The plan was drawn up by a scientific committee and the process overseen by an advisory committee representing the regional stakeholders. The plan is concerned with maintaining or improving the productive capacity and sustainability of forest ecosystems in order to optimise both koala conservation and wood production. The plan nominates six zones based on vegetational and environmental attributes, and their potential as koala habitat. One of these zones is fully protected from logging. A number of silvicultural methods (from conservative selection logging to patch cutting and clearfelling), each with emphasis on the conservation of koala food-source trees, are

nominated for the other zones in order to achieve, overall, a balance between wood production and koala conservation. This recognises that management systems for ecologically sustainable forest management must be capable of generating diversity in silvicultural practice consistent with the ecological attributes of the forest, the objectives of management and the circumstances of each operation.

Silvicultural Strategies

An account of silvicultural practice, and the rationale for that practice, are normally given in the management plan. Silvicultural practice within the east coast forests has been based principally on a management system designed to eke out supply to industry by retaining those trees and species with the greater production potential, and ensuring they have room to grow; and within the Eden Management Area, through a system of 'clearfelling with retention of prescribed stand components'.

These management systems will not necessarily have delivered the ecologically sustainable forest management criteria relating to the maintenance of natural community patterns and ecological processes, the maintenance of productive and healthy forests, the restoration of degraded ecosystems, and ecologically sustainable harvests.

The Group notes in particular that the failure over several decades to provide for the regular recruitment of new age/size classes within the uneven-aged forests may be jeopardising the achievement of ecologically sustainable product yields for quite some time. This deficiency was recognised by State Forests of New South Wales in 1994 in their introduction of the 'Gaps and Clusters' technique to the forests. This was designed to create regeneration openings at each harvest, and the progressive recruitment of new age classes. However, there was community opposition to the proposal and the early implementation standards, and the practice was discontinued. Canopy openings were subsequently limited by the Government to 50m width – a blanket prescription which is not necessarily consistent with the ecologically sustainable forest management criteria, and needs to be amended in formulating new silvicultural policies and strategies for the forests.

The future delivery of ecologically sustainable silviculture requires that a strategic silvicultural plan be prepared for New South Wales forests – consistent with the statement of silvicultural policy. State Forests of New South Wales recognise this in their 'Overview of management elements':

At the present time, silviculture, the dynamic principle at the heart of forest management, is in

a policy limbo. The range of appropriate silvicultural systems and practices available for application to both native forests and plantations needs to be fully described at all levels in any ecologically sustainable forest management/EMS framework.

A silvicultural strategy might deal with, for each forest type:

- the environmental relationships of the forest type (helping to appreciate limits to disturbance and change in forest ecosystems);
- the principles of ecologically sustainable silviculture applying to the type;
- the ecological and silvicultural attributes of the species influencing stand regeneration and stand dynamic processes;
- the potential values and roles of the forest other than wood production;
- the range of silvicultural methods and intensities of disturbance consistent with ecologically sustainable practice;
- ways in which the different silvicultural methods might be used to achieve different objectives and priorities; for example, primary emphasis on wood production in parts of the type, and primary emphasis on wildlife in others;
- the periodic establishment of regeneration within the uneven-aged forests and progressive recruitment of new size classes; and
- practices to restore forest degraded by past practice.

The strategy might apply not only to the forest types as currently designated, but also to significant vegetational and structural variations within the types. For example, the 'Dry Blackbutt' type may be a near-blackbutt monoculture at one end of its vegetational spectrum, and a complex mixture of species with different attributes at the other. Silvicultural solutions may differ appreciably at different points within the spectrum. For example, canopy openings may be considerably greater within good quality forest comprised mainly of blackbutt, and more variable but generally smaller within the mixed species forest.

The expert working group sees silviculture in terms of practices which respond to planning at the wider landscape level, delivering a number of objectives in an integrated way. This will require a high level of expertise and field experience in a number of disciplines, and a good sense of professionalism in seeking the appropriate balance between wood

production and environmental conservation. State Forests of New South Wales will need to look to the development of these attributes in its professional staff, or adopt a team-based approach to silvicultural planning and implementation.

Because the delivery of ecologically sustainable silvicultural practice will be monitored, it will be necessary to prepare a silvicultural plan defining the objectives and priorities for each planning area (for example, several compartments), and showing, in broad outline, the silvicultural regimes which might be applied to the units of the forest that have different vegetational and structural attributes.

Recommendation 3.28: A silvicultural strategy should be prepared for New South Wales forests. This should be based on an analysis of the present forest condition and, for each forest type, deal with:

- the environmental relationships of the forest types – and the relevance of this to silvicultural practice;
- the ecological and silvicultural attributes of species and stand dynamic processes;
- ways of achieving full site regeneration;
- the environmental and economic values of species and communities;
- an appropriate mix of silvicultural methods which can be used to achieve a set of management objectives;
- practices to restore degraded forest in an environmentally sensitive way.

Recommendation 3.29: State Forests of New South Wales consider the need to develop within the native forests the range of size classes (each in a dynamic condition) required to deliver ecologically sustainable product yields.

Recommendation 3.30: State Forests of New South Wales ensure that the ecological and silvicultural expertise which its professional staff will need in order to achieve management objectives and maintain ecologically sustainable ecosystems is enhanced through appropriate training and education programs.

Fire management strategies

Wildfires, post-harvest burns, and regular fuel reduction or prescribed burns have positive and negative impacts on forest ecosystems. The positive effects of moderately intense fire include the partial sterilisation of soil, enhanced nutrient availability, a more favourable soil biological environment for root

growth, and establishment of a soil-improving shrub stratum which also serves as a food source for some arboreal animals. As a consequence of these positive effects, the crown and diameter growth of recovering trees may be stimulated (Florence 1996, Chapter 8). The negative effects of moderate to high intensity fire are largely the damage caused to tree boles and wood quality and accelerated losses of soil and litter nutrients. There are also positive and negative effects where fire of relatively low intensity is used regularly to reduce fuel accumulation and wildfire hazard (positive benefits). Some of the negative effects of prescribed burning are discussed in Florence (1996). It is not surprising that fire in forests is a controversial topic, making it difficult to assess the consistency of fire management systems with ecologically sustainable forest management principles.

The recently enacted Rural Fires Act seeks to achieve a balance between the protection of life and property from wildfire, and environmental issues. It places greater emphasis on environmental conservation in bushfire management. The Act requires that certain activities for mitigating and suppressing bushfires (and other fires), coordinating bushfire fighting, and protecting people and property be carried out with respect for the principles of ecologically sustainable development.

A bushfire risk management plan sets out arrangements for the reduction of bushfire hazard in rural fire districts. On the one hand, the use of fire may be prohibited in all or specified circumstances – because of the effects on flora or fauna or cultural heritage values; and on the other hand, a local authority may require a private land owner or occupier to carry out specified hazard reduction work. Another important feature of the Act is that, for the first time, there is provision for public participation in the preparation of bushfire risk management plans and, for landowners, the right to object to or appeal against local authority notices.

A fire system might contribute to the delivery of ecologically sustainable forest management where the policies, strategies and fire management practices are designed to achieve a socially acceptable balance between:

- the periodic use of low-intensity fire to reduce the fuel accumulation and protect the forest against highly damaging wildfires;
- complete protection of forest from fire in order to protect soils and water and conserve biodiversity and environmentally significant communities; and

- the use of managed fire (of nominated intensity) to help maintain fire-dependent ecosystem processes, elements of faunal habitat, seedling regeneration and stand productivity.

The appropriate balance may be achieved where there is a mosaic of protected forest areas, and areas which are burned at different frequencies and intensities; and where the mosaic pattern has been defined using all available scientific and technical knowledge. This should now be considered separately under the Rural Fires Act. Fire planning in this way requires comprehensive information on forest biodiversity and the effects of fire on that biodiversity. In their response to the Eden Management Area Environmental Impact Statement, the National Parks and Wildlife Service expressed concern that, in preparing fuel management plans for areas, inadequate account was taken of listed threatened species, rare or threatened Australian plants species, and vegetation communities of conservation significance. State Forests of New South Wales may need to take greater account of this in preparing these plans, and delivering ecologically sustainable forest management.

In order to ensure that appropriate fuel management is carried out on all tenures, access to all databases, particularly those held by government agencies, should be made available to State Forests, other land and fire management agencies and local Bushfire Committees.

Recommendation 3.31: That State Forests of New South Wales incorporate within its fire management strategy the principle that all available social, cultural, scientific and technical knowledge be used in determining a socially acceptable balance between resource protection, conservation, and cultural and production objectives.

Grazing management strategies

Given the recognition of forest grazing as a ‘threatening process’, it is necessary to question whether grazing should retain a place in public forest management based on ecologically sustainable forest management principles. In revising its grazing policy, State Forests of New South Wales must balance the threat posed by grazing against its socio-economic value to local people.

Recommendation 3.32 That permission to graze in public forests be conditional on the preparation of plans which deal with the protection of biodiversity values and the delivery of ecologically sustainable forest management through

mechanisms such as fencing and stock exclusion from environmentally sensitive areas.

Harvesting plans

As they relate to silvicultural decisions, State Forests of New South Wales guidelines for harvesting plans require documentation of forest types by stand condition and other parameters, and any local variations to the standard forest types. Silvicultural prescriptions are normally presented in terms of the objectives of tree marking for both uneven-aged forests and regrowth forest thinning, and any 'gapping' rules applying to the forest. For example, the Harvesting Plan for Compartment 233 Gladstone S.F. requires the retention of trees capable of increasing in value, and the removal of the occasional group of mature trees to create favourable conditions for the establishment and growth of regeneration – groups so created to have a maximum diameter of 50m randomly distributed over the harvest area.

As for the strategic management plan, the silvicultural decision-making processes as expressed in current harvesting plans are not consistent with the delivery of ecologically sustainable silvicultural practice or ecologically sustainable product yields.

The present practice of submitting harvesting plans to the regulatory agencies and Regulatory and Public Information Committee for each compartment or group of compartments is a time-consuming and expensive procedure. The expert working group believes that State Forests of New South Wales professional staff would be far more effectively employed in a range of field activities designed to achieve a better balance between wood production and environmental objectives – as designated in the strategic management area plan.

The Environmental Impact Statement

While the environmental impact statement has helped to bridge the gap between timber-oriented management of the past and management based on ecologically sustainable forest management principles through prescriptions for protecting flora and fauna, requirements for State Forests of New South Wales to set levels of timber production, protection of cultural heritage, including Aboriginal sites, and prescriptions to protect soil and water values, it remains largely a descriptive document which presents an account of current practices and standards, and justifies them in terms of environmental impacts and safeguards. The expert working group recognises that the environmental impact statement process has extended an appreciation of environmental management within State Forests of New South Wales and the matters

which must be taken into account in formulating management strategies. Moreover, many environmental impacts have been mitigated through the environmental impact statement process and the conditions for approval by the Minister for Urban Affairs and Planning. While the Environment Protection Authority regulations prescribe the contents of an environmental impact statement, including consideration of ecologically sustainable development and the analysis of options, the environmental impact statement as developed has provided only limited scope for lateral thinking about objectives, practices and standards, or for exploring the ecological underpinning of those practices and standards, and it offers little scope for taking account of vegetational and structural diversity at the site-specific level. This is illustrated in the application of a single silvicultural system across the Eden Management Area in a way which cannot respond to the area's inherent site, vegetational and structural diversity, and hence may not fully meet the provisions of the ecologically sustainable forest management principles, particularly Principles 1B and 1C.

The Group believes that the preparation of an environmental impact statement will be unnecessary where a more comprehensive planning and monitoring process is in place. That process might provide for:

- land-use determinations, as made through the RFA process;
- incorporation in strategic management area plans of all wildlife protocols, pollution control provisions and the codes of practice needed to deliver ecologically sustainable forest management;
- a greater appreciation of ecological diversity and its management significance, principles of ecological sustainability, and the need for greater diversity in silvicultural practice to achieve management objectives;
- provision for assessment of the environmental impacts of activities, ongoing refinement of practices to ameliorate impacts and, where warranted, site-specific environmental analysis.

In addition to duplicating much of the content of a strategic management area plan, the preparation of an environmental impact statement would consume resources better spent on field supervision and monitoring operations.

Principle 1D: Conservation of soil and water resources

The values include the maintenance of soil conditions important for forest growth and biodiversity, soil carbon storage and changes in water yield and quality.

The current approach in New South Wales to the protection of soil and water resources has the following main elements:

- the development of catchment management plans that include a range of strategies for the protection of soil and water values (largely under development) – these have no power to protect soil values *per se*, but deal more with water supply and use;
- the use of the preferred management priority classification for state forest land to list areas where the special management emphasis is catchment protection – these are areas that form catchments for domestic water supplies or environmentally sensitive aquatic ecosystems;
- the use of a ‘protected’ land classification system on private land that is currently administered by the Department of Land and Water Conservation, and the application of the Soil Erosion Mitigation Guidelines for Logging (*Standard Erosion Mitigation Guidelines for Logging*) to harvesting operations on private land;
- planning and management activities conducted by the National Parks and Wildlife Service on conservation lands;
- the specification of goals and guidelines for soil and water protection in forest practices codes; and
- the application of conditions specified in a Pollution Control Licence granted by the Environment Protection Authority for harvesting in a State Forest.

Catchment Management Planning

The New South Wales Government announced major water reforms in August 1997 that focuses on improving the health of rivers and groundwater, and improving the security of water-supply to users.

Under the reforms, unregulated coastal rivers (as distinct from those rivers regulated by a head storage, primarily westward flowing) with forested catchments were to be classified by early 1998 as stressed, unstressed or of high conservation value. The classification will determine the priority to be given to the development of a management plan by community-based river management committees. River Management Plans (river flow and water

quality management plans) will be developed for stressed rivers and those of high conservation value through a local water management committee. River flow management plans will ‘define water access rights and put in place measures to fix the water sharing rules for a five year resource secure period’. Water quality action plans will focus on ‘pollution reduction strategies from point source pollution and broad scale catchment land use strategies for diffuse pollution’ (*Water Reforms: Information for Water Users*, Department of Land and Water Conservation, September 1997).

The argument concerning coastal streams is that the main factor affecting river health is not the total amount of water taken but the timing of it. Water is generally taken from streams during low flow periods, which correspond to dry conditions.

The focus of the reforms in terms of river flow is on water taken out of the river rather than on activity in the catchment that determines the flow into the river. References to the broader catchment context seem to stem from a concern with pollution rather than with water yield. The effects of forest management on local water use deserves more emphasis. The failure to consider water yield issues in the context of in-stream flows may be because the agenda has been determined by problems associated with regulated inland rivers rather than coastal rivers. Eighty per cent of water use occurs in inland New South Wales (20 per cent in coastal New South Wales) where only 25 per cent of the run-off occurs.

Total catchment management under the *Catchment Management Act 1989* is currently under review. A consultant’s report was to be assessed by members of the State Catchment Management Coordinating Committee by the end of 1997 (*Water Reforms: Information for Water Users*, Department of Land and Water Conservation, September 1997). Early indications are that fundamental changes will not be made. Current government policy is to create new committees (for example, regional vegetation management committees and river management committees) rather than to use existing catchment management committees, which must comprise a majority of landholders and in some cases are perceived to be unrepresentative of all stakeholders.

Catchment planning for the protection of soil and water and other values is considered important in the National Forest Policy Statement, but still relatively underdeveloped in New South Wales. Correcting this situation will require a major effort as well as effective public participation. Broad land-use planning is required to deal effectively with water values. The forest practices code deals mainly with

local scales and provides little guidance on water yield. Effective codes of practice for agriculture as well as for forestry will be needed to achieve water objectives in catchments where both land-uses are important.

Recommendation 3.33: Catchment management planning that incorporates the role of forest management on water yield and quality needs to be strengthened and expedited. Such planning must be linked closely to the development of regional vegetation management plans that have biodiversity as a primary focus, but which clearly have consequences for other catchment values. There is a need to clarify how Catchment Management Committees and Regional Vegetation Committees can effectively work together. Effective catchment management will require the development and implementation of codes of practice for major tenures and land-uses. The effectiveness of guidelines forming codes, and of other protocols (for example, the Pollution Control Licence) in protecting water values needs to be evaluated, as a matter of high priority, utilising research and monitoring.

Preferred management priority classification for State forests

The mapping of areas of State forest where the major management intent is catchment protection is distinct from, but complementary to forest Area Management Plans. The preferred management priority classification is broad in its prescription, spatially detailed and subject to continuous revision.

Catchment protection areas may require the development and application of stringent management prescriptions and the imposition of appropriate wet-weather logging controls to maintain water quality and catchment stability, and to prevent accelerated soil erosion.

Initial classifications are made by the District Forester, reviewed by the Regional Planning Manager and approved by the Regional General Manager. Certified maps are held in local State Forests of New South Wales offices. Review is internal and on-going as a part of district planning.

There are no documented criteria on why forested land should be classified in this way (for example, soil type, erodibility, slope class, stream category etc.). This effectively makes it impossible to ensure consistent classification within or between regions. Documentation of the reason for classification is extremely brief (for example, need to maintain water yield and quality within a catchment), and there are no links to specification of prescriptions needed to

achieve protection. While prescriptions are specified in more tactical (for example, harvesting) plans, a basis for why they need to be modified to give special protection to catchments is needed but does not exist (for example, in codes of Practice, application of Standard Erosion Mitigation Guidelines for Logging etc.).

Maps are available for inspection by the public in district State Forests offices, but there appears to be no process for public input into decisions on the classification of particular areas. Review of classifications and approval of change are entirely internal processes.

The preferred management priority classification has some value in protecting soil and water values, but it requires better documentation of the process and reasons for classification of specific forest areas. Experts and the public need to be better involved in decision making and periodic review.

Recommendation 3.34: Existing classifications used by State Forests of New South Wales should be reviewed as part of the preparation/revision of Area Management Plans following completion of the RFA process. Improvements would result from:

- providing documented guidelines to aid more consistency in allocations
- better documenting the reasons for classifications
- directly linking the requirements for special management prescriptions to the source of, or as a guide to, those prescriptions (for example, codes of practice, management manual, conservation protocol etc.)
- better involving 'experts' and the public in decisions.

Management of protected lands

'Protected lands' are areas of private land that have been mapped as requiring assessment and special management in relation to any proposed use. These lands include steep (>18°) country, riparian zones within 20m of a stream, and other environmentally sensitive areas. Applications to use any such areas are made to the Department of Land and Water Conservation, which assesses impacts on soil and water (and other) values before approval (sometimes with conditions) or rejection of the application. The Standard Erosion Mitigation Guidelines for Logging apply where the application is to harvest private forest. The guidelines cover roading and snig tracks, ground water management, filter and protection

strips, felling, snigging and timber extraction tracks and log dumps.

Issues are:

- Some areas of sensitive land may not have been mapped as protected lands initially.
- The existence of systematic processes to check that private land owners are complying with the requirements.
- Whether conditions are attached to permission to use protected lands actually achieve protection of soil and water values.

There are currently no formal processes to ensure the protection of soil and water values on other (non-protected) private land. The Department of Land and Water Conservation has the power to make a Soil Protection Order where practices are considered unsustainable. Likewise, the Environment Protection Authority will investigate complaints of activities that threaten water quality. In practice however, neither of the procedures is widely used.

Recommendation 3.35: The adequacy of the protected lands classification in relation to erosion, and of mechanisms for ensuring compliance with it, should be reviewed by a panel external to the Department of Land and Water Conservation. Riparian areas in farmland should be maintain and improved.

Management of Other Private Forests

On private land, clearing of native vegetation for plantation establishment is covered by provisions in the Native Vegetation Conservation Act, which are described and evaluated in Chapter 2. The Forest Practices Code Part Three (Plantation establishment and maintenance) provides adequate guidance for the protection of soil and water values on private land.

A major gap in coverage by codes of practice, applies to harvesting native forest on non-protected private land. Currently there are no effective guidelines for protecting soil and water values that can be applied in more than a voluntary manner. A code of practice that applies to all forested land needs to be developed.

Recommendation 3.36: Mechanisms need to be developed to ensure effective protection of soil and water values on other private forested land. These mechanisms are best specified in a code of practice that applies to all private forest.

Planning and management by the National Parks and Wildlife Service

The National Parks and Wildlife Service has an obligation to protect water quality under the *Clean Waters Act 1970*. The Environment Protection Authority does not require the National Parks and Wildlife Service to undertake any specific action to achieve this (equivalent, for example, to adherence to the Standard Erosion Mitigation Guidelines for Logging for forest harvesting).

The Environment Protection Authority can investigate complaints, but rarely does so.

Currently there appear to be no consolidated guidelines for National Parks and Wildlife Service activities that give emphasis to protection of soil and water values at regional landscape or local scales. For example, prescribed burning activities will increase the threat to soil erosion and water quality in particular parts of the landscape. No specific planning appears to currently be in place to assess these risks, and to mitigate potential impacts. The National Parks and Wildlife Service Fire Management Manual does not consider soil and water values in any systematic way. Guidelines for the construction and maintenance of roads and tracks do not exist.

Recommendation 3.37: The National Parks and Wildlife Service needs to develop systematic procedures for assessing threats to soil and water values, and guidelines for mitigating such threats. These elements should form part of a code of practice for management of conservation areas.

Use and development of Forest Practices Codes on State Forests of New South Wales land

A code of forest practice outlining goals and guidelines for the protection of soil and water values has been developed for harvesting in State forests, and for the establishment, management and harvest of accredited plantations on public and private land (Timber Plantations 'Environment Protection' Harvesting Code 1997).

A draft (Part 4) of the Code, dealing with forest road and fire trail construction and use, has also been prepared. The sections of the codes dealing with soil and water protection must be read in conjunction with the Pollution Control Licence, and the Standard Erosion Mitigation Guidelines for Logging. Together, these provide a comprehensive set of guidelines for harvesting operations. As the scientific basis for many of the guidelines is still meagre, monitoring of their effectiveness in achieving protection of soil and water values is essential to on-going improvement of them.

One area where evaluation of effectiveness is especially critical is the prescriptions for stream filter and buffer strips (also specified in the Pollution Control Licence, and Conservation Protocols). The scientific underpinning for these is minimal. There is a need to protect headwater streams and to adopt a precautionary approach. Drainage depressions (ephemeral streams) are currently protected by buffer strips (where trees are harvested but where machine disturbance is not permitted) but the adequacy of these on soils of low permeability is unknown.

Recommendation 3.38: Further research, and targeted monitoring of water quality is needed to evaluate the effectiveness of currently prescribed riparian buffer and filter strips. Further research is urgently needed to refine the local application of guidelines for protecting water quality and aquatic habitat under a range of environmental conditions.

Use of a Water Pollution Control Licence

Harvesting activities in State forests are regulated by a Harvesting Plan (an approved and legal document) that includes guidelines and mandatory prescriptions about the Pollution Control Licence granted by the Environment Protection Authority, or compliance with the Standard Erosion Mitigation Guidelines for Logging.

Currently State Forests of New South Wales operate under a Pollution Control Licence which effectively subsumes the Standard Erosion Mitigation Guidelines for Logging. The Pollution Control Licence contains schedules dealing with harvesting/roading planning, assessment of water pollution hazard and specification of associated management conditions, specification of management practices to mitigate pollution risk, and auditing and monitoring requirements. A range of concerns about the practicability and reliability of current methods (as used in the September 1996 Pollution Control Licence) to estimate erosion risk and water pollution hazard based on the SOILOSS model and individual coupe assessments, has led to proposals to develop improved systems.

State Forests of New South Wales and the Environment Protection Authority signed a Memorandum of Understanding (MOU) in April 1997 agreeing to develop improved systems (both regulatory and forest management) for the conservation of soil and water values as part of forestry operations in New South Wales. Key elements include: development of a new hazard assessment system; definition of field survey needs, mitigation protocols and Best Management Practice;

annual licensing of State Forests of New South Wales activities together with self-audit; Environment Protection Authority audit on a selection of compartments; monitoring of water quality to confirm adequacy of protocols; and provision of better training and field guides. The MOU specified a timetable of implementation that would culminate in a new licence by July 1997.

The expert working group understand that the new licence will not be implemented before early 1998. The detail of documents underpinning the new system were not available to the expert working group (for example, field survey needed to conduct the assessment, management protocols to mitigate risk, processes for monitoring effectiveness and refining the system). The level of detail presented in the document 'Soil erosion and water pollution hazard assessment for logging operations' (Environment Protection Authority, State Forests of New South Wales Department of Land and Water Conservation, August 1997) is sketchy in relation to these issues, and raises many unanswered questions. The expert working group concludes that validation of the new system is essential. This requires a good system of ground observations and monitoring of water quality. Priority must be given to considering these issues soon after implementing the new licence. This is more important than, and must be given auditing priority over, the implementation of a system that may not be effective. Monitoring of effectiveness, combined with enhanced research and development in this area to progress the development of improved systems is an urgent requirement.

Recommendation 3.39: Testing of the effectiveness of the new Pollution Control Licence protocols for assessing soil erosion and water pollution hazard, based on ground observation and monitoring of water quality, should be initiated immediately. Such testing must be given at least equal weight as is given to auditing of compliance with the new system.

Principle 1E: Positive contribution of forests to global geochemical cycles

The expert working group has confined analysis to change in carbon (C) cycles because forest management can have a major impact on these, and such impacts are much more predictable than change in other elemental cycles.

The current approach to maintaining the contribution of forests to global carbon cycles has four main elements:

- planning to maintain as much forest cover as possible in New South Wales, including some conversion of agricultural land to plantations;
- expecting that conversion of mature native forest to regrowth stands will have a minimal effect on forest carbon storage;
- expecting that over time the scales of a forest rotation or longer carbon release from management burns will be equivalent to that from decomposition plus wildfires; and
- a judgement by land management agencies that their current activities do not have a major impact on carbon budgets.

Planning to maintain forest cover

Planning at a number of levels aims to maintain forest cover in the long term. No public land is being cleared for conversion to plantations. A significant area of forest is being cleared on private land; only a small part of this land is being converted to plantations, with the remainder going to non-forest uses. Plantation areas are being expanded at a rate of about 10,000 hectares per year, mostly on ex-agricultural land.

The current rate of agricultural land clearance is uncertain in New South Wales, but is thought to be significant (~100,000 hectares per year). This will result in a large release of carbon from woody biomass and soil per hectare in the short term. The degree of loss in the longer term is unknown but is still likely to be large, even where plantations are established, because they will be harvested on relatively short rotations before a large accumulation of C in biomass occurs. Plantation wood will also in many cases have a short residence time before sequestered carbon is released as carbon dioxide.

There is a strong need to raise awareness of the economic and other benefits of maintaining a productive forest cover on the large areas of private native forest in New South Wales.

Carbon storage

Most current harvesting of native forest in New South Wales is of mature stands and a considerable area is harvested annually. This will continue for another 20 to 30 years, in association with a progressively increasing reliance on regrowth forests. Thinning of regrowth will progressively increase.

Little information is available to accurately model the scale of changes in carbon storage associated with forest harvesting and regeneration. The progressive conversion of mature stands to regrowth will lower the storage of carbon in standing biomass (i.e. reduce

C density). The pre-harvest quantity of sequestered carbon is unlikely to be re-accumulated in the regrowth stands where smaller and younger (<100 years old) trees will be harvested. The areas of greatest uncertainty are the pattern of carbon re-accumulation in forest biomass, the effects of harvesting and fire regimes on changes in the soil carbon store, and the residence time of carbon in harvested forest products. The expectation that conversion of mature native forest to regrowth stands will have minimal effect on carbon storage is unlikely to prove correct.

Carbon balance

Prescribed fire is used for regeneration and hazard reduction purposes.

Current fire regimes are very different from those occurring in nature, and their effects on ecosystem carbon budgets is uncertain. The main unknown is the effect of management burning and wildfire on forest productivity and long-term soil carbon storage. Carbon storage in forest litter and residues is unlikely to be affected by management burning in the longer term. Further study will be needed to reduce these uncertainties and to clarify whether the expectations are likely to prove correct.

Carbon budgets

At present no explicit attempt is made to manage for carbon retention.

To date, other management objectives have been given priority because the effects of management on carbon budgets have been considered small. Research is required to determine the validity of this assumption. A process of data collection and modelling should be initiated to enable the effects of management on the carbon budget of New South Wales forests to be reliably estimated. Specific matters to be investigated are forest clearing, plantation establishment, change in the age-class distribution of native forests, the effects of fire management, and the residence time of carbon in forest products. Although changes in the forest carbon budget need to be calculated for New South Wales, they need to be interpreted from both State and national perspectives. For this reason, the approach used in New South Wales needs to be compatible with any national effort to quantify the effects of forestry activities on the carbon budget. The development of a joint State-Commonwealth approach to this matter is urgent, so that collection of obviously important data in New South Wales can begin as soon as possible.

Recommendation 3.40: Data collection and modelling should be initiated to enable the effects of management on the carbon budget of the total New South Wales forest estate to be reliably estimated. The approach adopted must provide information that can be interpreted by New South Wales and within a national perspective; it is thus a joint New South Wales-Commonwealth responsibility.

Principle 1F: Long term social and economic benefits

There are many socio-economic benefits to be derived from the native forests, including the supply of clean water, the harvesting of a range of forest products, recreational use of the forest, grazing, bee-keeping, supply of extractive materials (rock, gravel) and others. There are also intangible social welfare benefits. People may value the aesthetic attributes of a forest, its tranquillity, its biological complexity and structural diversity, the spiritual uplift it provides, or simply knowing that it is there. Forests may be managed for use which involves disturbance (for example, wood production, grazing, some aspects of recreation) yet retain much of their intangible value.

A critical role for forest planning is to maximise net socio-economic benefit by striking the best balance between uses. This requires:

- access to adequate economic and other information about the possibilities for supply of values from the region's forests, and society's demands for these various values;
- the use of a comprehensive planning framework that effectively incorporates consideration of all values;
- minimisation of distortion of markets for forest outputs, particularly in the pricing of products or services; and
- the adoption of a planning process that is ongoing, rather than 'once off', which continues to monitor performance in relation to implementation and the economic and other information that underpins the plan and adaptation to the changes.

Economic information

The availability of economic information is poor for many forest values. The collection of economic data about forest use is most complete with regard to those products traded openly in markets (log supply), while for other values (recreation, water, intangibles) little is known. Some critical areas where information is lacking include the responsiveness of supply and demand to changes in price (for example,

log supply, recreation), and the demand for intangibles.

While considerable efforts are being made to overcome these deficiencies during the RFA process, and the new data will be most valuable to decision makers, it will be incomplete because in some cases effective data collection and analysis require more time, and in others, effective methodologies are yet to be developed.

It is important to recognise that the ability to achieve the highest possible socio-economic benefits in both the RFA and the Strategic Area Plans of State Forests of New South Wales and the National Parks and Wildlife Service are affected by the incompleteness of the economic data. Continuation of economic research and data collection for a considerable period are required to refine the basis of future plans.

Recommendation 3.41: There is an urgent need for further development of economic research capability in the agencies responsible for forest management and for the collection and analysis of economic information on forest uses. The formation of a social and economic research group within the proposed Forest Research Unit to serve all agencies would achieve considerable benefit through economy of scale and a broader perspective on the issues.

Planning

The absence of critical economic data makes the task of forest use planning for both production forest and national park difficult. In the absence of soundly based economic information, increased reliance must be placed on the effective participation of a wide range of stakeholders as a proxy for society's economic and social viewpoint. The development of planning processes for complex natural resource management is also in a comparatively early stage of development. Important issues include the ability to present diverse information effectively to planners, ensuring representativeness for all stakeholder groups, and the management of group processes to ensure participative planning.

Recent developments in computer technology, particularly in Geographic Information Systems technology and in environmental systems modelling are providing important support tools for presenting the information on the biophysical systems, but the usefulness of these is constrained by the adequacy of input data. There is an even greater deficiency in the absence of similar representations of the corresponding regional socio-economic systems.

Distortion in the pricing and supply of forest values

Several players exercise a large influence in the markets of some forest values (for example, State Forests of New South Wales and several large sawmill groups for log supply; National Parks and Wildlife Service and State Forests of New South Wales in the area of forest based recreation). Price setting in the market for these forest uses is a difficult issue, particularly in the case of log supply agreements where there is no competition, and supply levels are constrained by physical availability and policy direction. Setting prices at too low a level encourages demand, but can also encourage the conversion of logs to low-value products and the resultant higher harvest levels can have increased detrimental effects on other values. Setting high log prices reduces the demand and can restrict processing options to higher-value products, but can reduce the total socio-economic output where processing industries become uneconomic.

State Forests of New South Wales has recently developed a new approach to setting hardwood log royalties. This places greater recognition on inherent log qualities and market opportunities for log processors. It has resulted in a greater range of log prices, with considerable increases for some high-value species. In general, higher-value species present greater opportunity for value-adding processing. The higher market prices send a signal to growers that should encourage investment in silviculture to increase the future supply of more valuable logs. Prices established by State Forests of New South Wales have a considerable influence on the prices received by other growers. The further development of a more competitive log market is encouraged.

Maintaining ecologically sustainable forest management

The contribution of regional forests to socio-economic values cannot be optimised or fixed at a single point in time. Over time there are (a) changes in the level of demand and willingness to pay, (b) changes in the physical possibilities for supply, and (c) changes in the cost of supply. All three factors are usually interrelated. These changes will inevitably continue after the completion of the RFA, and ongoing attention to the planning framework is required.

These unplanned-for changes in demand arise through the development of new industry, increases in population and/or wealth, and the development of recreational facilities and the balance in recreational demand between National Parks and other forests.

Unplanned changes in supply arise from fire, the willingness of private owners to supply and, in the longer term, from improved access and harvesting technologies and improved silvicultural practice, and recognition of the need to curtail recreational use in areas of high conservation value. There are also opportunities for planned changes in supply. Increased investment is possible in the public forests. Little is known about the private forest resource in New South Wales and its potential to contribute to long-term social and economic benefits. It is probably appropriate to say that much of the resource has been subject to 'logger's selection' and is now well below optimum condition. It should be possible to improve that condition progressively, enhancing the social and economic benefits from the sector.

Recommendation 3.42: That there be a survey of the private forest resource potential and economic prospects for its management. This function should be allocated to the Private Forestry Support Unit.

Achieving a balance between wood production and environmental conservation

The balance of supply of conservation and socio-economic benefits and the actual forest management units supplying these can usefully be adjusted over time. Greater flexibility in land-use decisions, and greater emphasis on the complementary management of State forests in meeting conservation targets, could lead to a higher level of conservation and socio-economic benefit. It should also be possible in land allocation to ensure social and economic benefits are maintained for the short term while working to further expand value-adding processing, improve the productivity of the public and private native forests, and build up an alternative hardwood plantation resource. It is envisaged that where forest has important environmental attributes, it might be placed temporarily in some special management (wood production) category and transferred to national park tenure as circumstances permit. In summary, key areas of particular short-term importance (for example, for sawlog, habitat, or recreational opportunity) can be moved into and out of the production area over time.

Recommendation 3.43: Consistent with the intent of the National Forest Policy Statement and the nationally agreed JANIS conservation criteria for forests, conservation targets should be met through a combination of dedicated forest reserves, areas protected within State forests, and areas zoned for management by special prescription. Increased consideration

should be given to the capacity of forest areas outside national parks and reserves, often referred to as 'non-dedicated' or 'off-reserve' forest, to contribute to meeting conservation targets, because in some circumstances this 'off-reserve' component can result in enhanced and more balanced ecologically sustainable forest management outcomes. Resources should be committed to quantifying the potential of carefully managed private native forests to contribute to conservation objectives.

While establishment of a comprehensive, adequate and representative system of forest reserves represents a significant step in achieving protection of conservation values, active on-going management of the reserve system is also crucial. Increased emphasis must be given to managing the biological resource for specified objectives, taking into account the contribution of all tenures.

The factor of greatest importance to net socio-economic outcomes is often the unpredictable change in the cost of providing the supply of forest values (for example, logs, recreation). Reductions in cost arise from technological improvement (for example, in harvesting or transport) while increased operational costs to forestry and park management arise from factors such as changes to codes of practice and conservation protocols. In recent years, significant operational changes were implemented in response to inter-organisational factors, and many of these were not adequately evaluated in terms of social costs and benefits. The ability to do this requires a capacity to predict and model costs and benefits at the planning stage, accurate monitoring of costs and benefits during implementation, and a close link between the operational and longer-term planning systems to ensure that the principles of adaptive management can be effectively deployed. This latter phase is of particular importance, because the procedures and protocols are often interim, or experimental in nature. They require ongoing fine tuning in response to careful study of their efficiency and effectiveness. These abilities appear not to be well developed at present and have been limited by the separation of responsibilities between agencies.

Recommendation 3.44: Improved mechanisms are needed for collecting and utilising information to enable cost-effective decision making. Accounting practices that allow full costing of all inputs to forest management should be developed. Without efficient costing of management efforts, the delivery of ecologically sustainable forest management components (environmental, social and economic) is at risk, and opportunities to develop more cost-effective procedures could be lost. Systematic trials to assess the cost-

effectiveness of alternative operational prescriptions should be undertaken. In particular, 'impact costing' should be used to ensure stakeholders fully appreciate the cost implications of their expectations.

Principle 1G: Heritage

The expert working group made no assessment of the ecological sustainability of management of cultural heritage values, including Aboriginal cultural heritage values contained within Principle 1G. Cultural heritage values are currently being assessed by the NSW Cultural Heritage Working Group through the project, 'Protecting Cultural Heritage Values and Places in NSW Forests'.

MANAGEMENT PLANNING FOR ECOLOGICALLY SUSTAINABLE FOREST MANAGEMENT: A SYNTHESIS

Regional planning: the Regional Forest Agreement

The following planning hierarchy is proposed:

Effective delivery of ecologically sustainable forest management requires planning at a number of levels. The highest level (regional planning) will be represented by the RFA process, and conducted across all forests (public and private) to assess the regional capability to produce/deliver the various forest outputs demanded by the community, to reach consensus about the targets for each value, to represent a regional consensus about the trade-offs between values needed to achieve a balanced ecologically sustainable forest management outcome, and (for public forest at least) to allocate areas of forest to their respective uses.

While the regional plan might be expected to stand for the period of the RFA, progress reports should be made at five-year intervals. Moreover, as there is inevitably continuous change in all aspects of the forest, and in the community and industrial demand for forest goods and services, it will be desirable to develop structures to permit re-examination and updating of the regional plan at periodic (say ten-year) intervals.

The overall aim of restructuring management systems and processes for private lands should be the replacement of project-based approval and management arrangements with regional land-use zoning, codes of practice, monitoring and regulation. It is envisaged that development approvals will be exempted from requirements to undertake 8 point tests and environmental impact statements within

specified zones identified on regional vegetation management plans – and incorporated in local environment plans and regional environment plans – where (i) comprehensive regional biodiversity surveys have been undertaken, (ii) approved codes of practice are available and will be adopted for the proposed activities, and (iii) effective monitoring and enforcement procedures are in place.

Similarly, the overall aim of restructuring management systems and processes for State forests should be the formulation of a more socially acceptable balance between conservation and production functions of the forest – through enhanced protection of forest ecosystems in nature reserves, complementary ‘off-reserve’ management, the preparation of comprehensive strategic and operational plans with the potential to deliver all ecologically sustainable forest management principles, updated codes of practice to reflect best practice, and more effective reporting, monitoring and audit of activities.

Strategic Management Area Plans

Plans for private forests:

It is envisaged that the preparation of a private forest management plan will be required for each property before commercial operations are conducted. These might be brief documents, but will require details such as an area map and forest description, consideration of the status of the forest types in relation to a regional vegetation management plan or other conservation status information and, possibly, soil and terrain in relation to slope stability and erosion hazard. An approved forest management plan could be used to establish forest areas as being under sustainable management, and might provide exemption from the imposition of zoning restrictions under local environment plans. An approval process might be developed whereby professionals with appropriate training can be accredited as forest planners by the Forest Regulator. Beyond this planning level, a separate activity plan would be required for each major management activity.

Recommendation 3.45⁵: The preparation of a Private Forest Management Plan should be required for each property and approved by the Forest Regulator before commercial operations are conducted.

Plans for public forests:

The strategic Management Area Plan holds the key to ecologically sustainable management within State forests and national parks, and requires the ongoing development of planning processes. Planning for

ecologically sustainable management will be a complex activity because of large forest areas, environmental and vegetational diversity, and the interests of multiple stakeholders.

There is a view that the RFA (regional plan) will also constitute the strategic Management Area Plan for State forests. This may be appropriate for some regions such as the Eden region. However, the expert working group has some concern about the level of detail within the RFA, particularly where a region is divided, for management control purposes, into three or more management areas. These management areas may have different environmental and vegetational attributes, service different industries with different product emphasis, and have their own local stakeholders wishing to contribute to management decisions.

Thus, the expert working group sees the hierarchical planning process based on the RFA (regional plan), one or more strategic Management Area Plans for State forests and individual plans for national parks, and tactical (operational) plans, with follow-up audit and monitoring (see Figure 3).

The strategic Management Area Plan will:

- provide for public participation at a number of stages in the plan preparation, including representatives of Aboriginal communities as determined by those communities;
- reference legislation, all policies and other plans, codes of practice and other operational documents which might be called upon in implementing the Plan;
- give an account of all forest attributes which will be critical in achieving ecologically sustainable forest management, including the species and community patterns and their environmental relationships, a historical appreciation of the structural attributes and productive condition of each forest type, forest wildlife and wildlife habitat, sites of environmental, cultural and heritage significance, and so on;
- state and justify all objectives of management and the priorities accorded them;
- present the conservation strategy for the forest based on the provisions of the regional plan (RFA) and a more comprehensive analysis of the environmental attributes of the forest; and on this basis,
 - prepare a zone plan, for example, for State forests and a preferred management priority plan showing areas additional to those determined in the RFA which might be

excluded from logging or managed for special purposes (flora and fauna conservation; soil, water and landscape protection, etc);

- reference the protocols/prescriptions for conservation of rare and endangered species where present (or likely to be present); and
- for State forests, present prescriptions for conserving plants and animals or helping ensure their recolonisation after logging (within the general wood production zone);
- reference the codes of practice dealing with roads and fire trails, and soil and water protection, to be read in conjunction with the Pollution Control Licence, and the *Standard Erosion Mitigation Guidelines for Logging*;
- include a monitoring program to evaluate the reliability of impact assessments and amelioration measures;
- present the objectives of wood supply or other uses, based on an appreciation of ecologically sustainable usage levels, targets set for different uses, risk assessment, prospects for meeting these targets in the short and longer terms, and ways of maintaining or enhancing the social and economic benefits derived from the forest;
- analyse options for balancing the different roles and values – or determine any trade-offs which may be needed to ensure a socially balanced solution to competing objectives;
- for State forests, present a silvicultural strategy showing
 - how multiple objectives may be achieved to the greatest possible extent by taking account of existing vegetational and structural diversity, and through diversity in silvicultural practice; and
 - how parts of the forest which have been degraded through past activities will be restored;
- reference plans for other forest activities such as fire management, grazing and any others relevant to the forest;
- present a financial statement demonstrating likely income, administration costs and anticipated management expenditure;
- provide for assessment of the environmental impacts of activities, ongoing refinement of practices to ameliorate impacts and, where warranted, site-specific environmental analysis; and

- ensure the Plan is auditable so that it can be subject to an effective review process.

Recommendation: 3.46: Strategic planning in public forests must be strengthened. While the format of plans prepared by the National Parks and Wildlife Service generally meets requirements for ecologically sustainable forest management, there is a need to complete plan preparation for all parks. For State Forests, a new strategic management area planning model able to deliver ecologically sustainable forest management needs to be developed. Such management area plans:

- must be developed by the responsible management agency;
- should initially draw on and be consistent with regional forest agreements;
- must be approved by the forest regulator (see later);
- should require an annual report to the regulator on achievements in relation to the plan;
- must be subject to periodic review (for example, at 5–7 year intervals) or as required by exceptional circumstances, and
- after review, should be resubmitted to the forest regulator for approval.

The strategic management area planning process must:

- assess environmental impacts in sufficient detail to allow management plans to replace the environmental impact statement process;
- set targets (for example, sustainable yields, size of animal populations, degree of site disturbance);
- provide opportunities for public exhibition and comment;
- allow determination by the forest regulator; and
- provide opportunity for review by the courts.

This process would be ongoing, providing a basis for adaptive management and continuous improvement, and represent the primary public forum for discussion and involvement in forest management.

Recommendation 3.47: Given the distribution of forest across several land tenures, National Parks and Wildlife and State Forests should coordinate their approach to the management of the comprehensive, adequate and representative reserve system, often referred to as the CAR reserve system (which is based on criteria defined by JANIS, the committee

established to ensure the implementation of the Natinal Forest Policy Statement), (see also Key Recommendation 13B).

Operational (activity) plans

Operational planning is comparatively well developed for the management of fire protection by most agencies, production and related activities on state forest and, in the case of private property applications, under the *Native Vegetation Conservation Act* – but less so for other tenures or activities (national parks, other crown lands, private property). This is partly a consequence of lesser degrees of activity.

Operational planning is a critical component of the hierarchy of plans which will regulate management of State forests. The plan will reference all codes, field guides for operations and other relevant documents. It will specify an area of forest to be harvested during a 2 to 3 year period. It will identify the ecological attributes of the forest; make provision for surveys identifying sites of environmental, cultural, heritage and Aboriginal significance, and the distribution of rare or threatened Australian plants and threatened wildlife species (or the likely habitat of those species); identify any sites which may be problematic in terms of soil and water conservation; and present a silvicultural plan showing how multiple-use and ecologically sustainable forest management objectives will be achieved through diversity in silvicultural methodology. Operations should be subject to internal audit (compliance with plan), monitoring of outcomes, and evaluation of ecologically sustainable forest management (see Chapter 7).

State Forests of New South Wales have compiled an Ecosystem Management Field Guide for South East Forests. This organises knowledge, research and regulatory requirements into one operationally functional document in order to streamline the process for delivering regulatory requirements to the forest manager. This approach is commended by the expert working group.

Figure 2 - Proposed forest planning linkages in relation to existing tenure

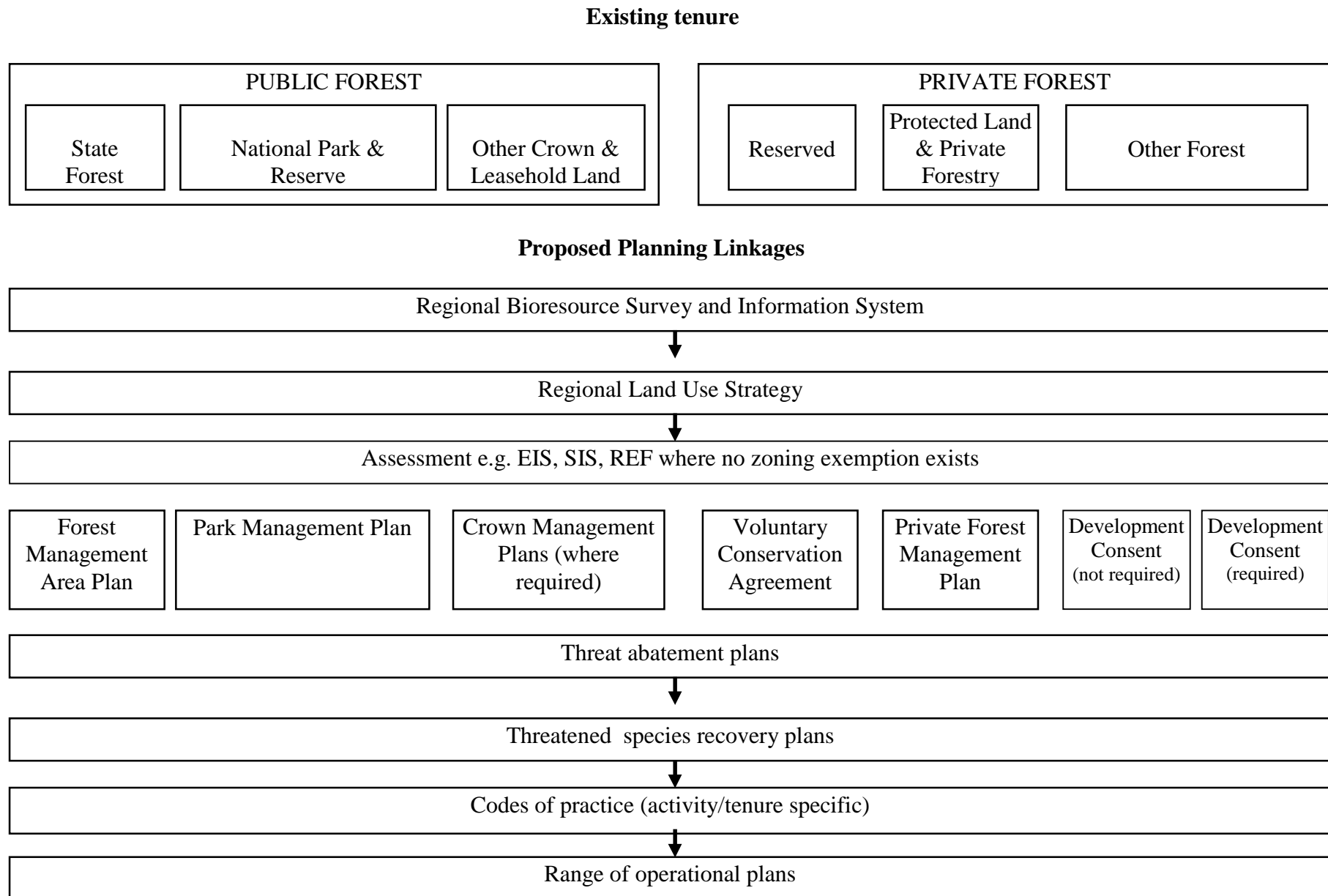
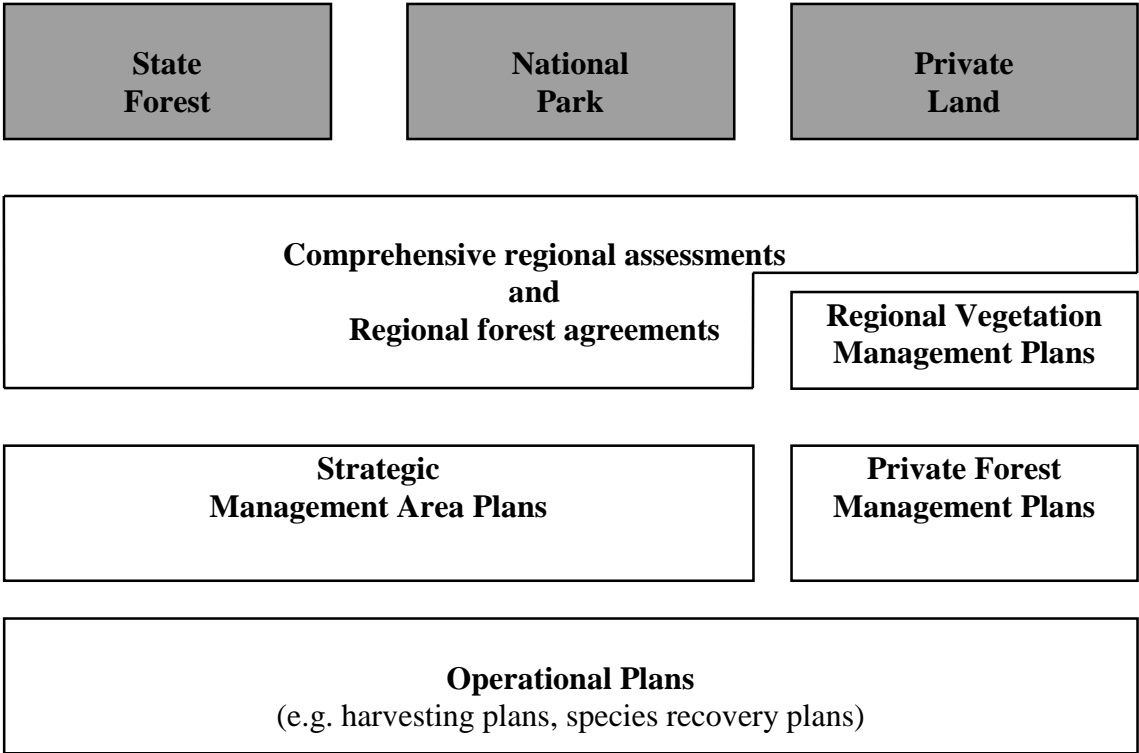


Figure 3 - Relationship between strategic and operational plans for different forest tenures in NSW



PUBLIC PARTICIPATION, INCENTIVES/ REQUIREMENTS AND THE PRECAUTIONARY PRINCIPLE

This chapter describes and reviews current management arrangements in relation to public participation in the decision-making process, incentives and requirements in relation to implementation (of ecologically sustainable forest management Principles 2 and 3), and the role of the precautionary principle (Principle 4) in achieving ecologically sustainable forest management.

PUBLIC PARTICIPATION

Introduction

Ecologically sustainable forest management Principle 2 requires provision for public participation, access to information, accountability and transparency in the delivery of ecologically sustainable forest management.

In relation to Principle 2, the National Strategy for the Conservation of Australia's Biological Diversity provides that:

- the co-operation of conservation groups, resource users, indigenous peoples, and the community in general is critical to the conservation of biological diversity; and
- processes for and decisions about the allocation and use of Australia's resources should be efficient, equitable and transparent.

There is currently considerable variation in New South Wales legislative provisions for public participation in resource decisions. Members of the public can participate in resource decision-making processes at two different levels:

- strategic planning
- operational planning.

Strategic Planning

At the strategic planning level, the core legislation, which has the potential to cover both private and publicly owned land is the *Environmental Planning and Assessment Act 1979*. One of its objects is:

...to provide increased opportunity for public involvement and participation in environmental planning and assessment.

There are legally guaranteed opportunities to comment on draft planning proposals, at the level of Local Environmental Plans and Regional Environmental Plans, but opportunity to comment on draft State Environmental Planning Policies lies in the discretion of the Minister. For example, there was no opportunity for public comment before the introduction of State Environmental Planning Policy 46, although the resulting reaction from the rural community makes it unlikely that this approach will be taken in the future. Regional vegetation management plans made under the *Native Vegetation Management*

Act 1997 must be placed on exhibition for public comment.

There are specific provisions about public participation in the strategic planning of land in public ownership. Management plans for national parks have to be exhibited for public comment, and these comments are then referred to the National Parks and Wildlife Advisory Council, which includes community representation. Management plans for nature reserves and wilderness areas are not placed on public exhibition, but are referred to the Advisory Council. It was not until 1995 that a process for the public exhibition of draft management plans for State forests was introduced. Finalised plans must be available for inspection by the public. The Director-General of National Parks and Wildlife can prepare a management plan for a State forest, but only with the consent of State Forests.

Anybody at all can nominate a species, etc. for listing under the *Threatened Species Conservation Act 1995* (TSCA s.19). After the Scientific Committee has made a preliminary determination, it must invite public submissions. Public submissions must also be considered in relation to declarations of critical habitat (*Threatened Species Conservation Act* ss 41-42).

Within other agencies, in particular the Department of Land and Water Conservation, there is a long tradition of non-statutory strategic planning.

There is currently no legislative provision for the development of strategic plans by the Department of Land and Water Conservation and opportunities for public comment depend on practice. For example, there was extensive public involvement in the development of component policies under the State Rivers and Estuaries Policy by the DWLC:

Working groups, with membership from both Government and community groups have been used extensively. Wider community consultation on policies occurred through workshops and written submissions (New South Wales Water Reform Fact Sheet Number 3, *Water Resource Management Policies*).

The Protection of the Environment Operations Act 1997 will allow the Minister for the Environment to make Protection of the Environment Policies (PEPs), which would be prepared by the Environment Protection Authority and made available in draft form for public comment. A

Protection of the Environment Policy, for example, could be made to provide guidelines or standards relating to private forestry management practices designed to prevent diffuse water pollution.

Project Control

At the operations level, there are various approaches to public participation in legislation on forest issues, which raises questions about the transparency of process.

Where development consent under the *Environmental Planning and Assessment Act 1979* Part 4 is not required for a particular proposal, the provisions of the Environmental Planning and Assessment Act Part 5 may apply and allow public comment on proposals which require an environmental impact statement because they are likely to significantly affect the environment. Currently, the forestry activities of State Forests are covered by Part 5, and on a number of occasions an environmental impact statement has had to be placed on public exhibition.

On the other hand, proposals requiring development consent that fall under the Environment Planning and Assessment Act Part 4 need to be accompanied by an environmental impact statement only if they fall within the very detailed list of designated development set out in Schedule 3 of the Environmental Planning and Assessment Regulation 1994. In these circumstances, the environmental impact statement must be placed on public exhibition for public comment. In addition, third party merit appeals are available to objectors to designated development. The list of designated development includes, for example, wood or timber milling or processing works with a particular capacity. Forestry and land clearing operations which require development consent do not fall within the list, whatever their impact on the environment.

The interim exemption from development consent for sustainable native forestry under the Native Vegetation Conservation Act means that these activities are unlikely to be subject to public comment unless they fall within the Environment Planning and Assessment Act Part 5. In this case an environmental impact statement must be prepared for public comment if the proposal is likely to significantly affect the environment. There are, however, generally no rights of third party merit appeal under Part 5, and response to public inquiries is discretionary.

Inconsistencies of this kind are a barrier to effective public participation in decision-making processes.

Where a species impact statement (SIS) is required, it must be placed on public exhibition if it has been prepared under the *Threatened Species Conservation Act 1995* or the Environment Planning and Assessment Act Part 5. This is not the case, however, if it is prepared under the Environment Planning and Assessment Act Part 4. This would appear to be an oversight. There is no basis in policy for such a distinction.

Apart from situations where an environmental impact statement and/or a species impact statement has to be prepared, putting a particular proposal out for public comment will only be legally required if it has been classified as 'advertised development' under the Environment Planning and Assessment Act (through provisions in an environmental planning instrument, a development control plan or regulation), if it has been identified in a development control plan as requiring public notification (e.g. the new category of complying development introduced by the *Environmental Planning and Assessment Amendment Act 1997*) or if there are special provisions in other legislation. There are no special provisions for the public exhibition of particular proposals to clear native vegetation under the Native Vegetation Conservation Act. There is no provision in the *Protection of the Environment Operations Act 1997* allowing public comment on applications for pollution control licences, although the Environment Protection Authority does consult with stakeholders on the frameworks of the more complex licences. The Government's position is that the right to comment on environmental impact statements under the Environmental Planning and Assessment Act Parts 4 and 5 is adequate. However, this is a one-off opportunity, whereas pollution licences are subject to regular review and adjustment. Moreover, if environmental impact statements for logging in State forests become less frequent after the RFA is completed, then the Environmental Planning and Assessment Act channel for public participation will be closed, although the gap may be filled by adequate provision for public comment during the strategic management planning process.

The fact, however, that there may in some circumstances be no legal requirement for public participation in decision-making processes relating to specific activities in forests does not

prevent decision-makers from inviting it as a matter of practice.

Access to the Courts : Standing to Sue

Under a number of pieces of legislation, anyone can bring proceedings to remedy or restrain breaches of particular legislation (for example, Environment Planning and Assessment Act, Threatened Species Conservation Act). However, a broad standing provision appears in section 25 of the *Environmental Offences and Penalties Act 1989* which, although contained in legislation concerned primarily with pollution control, applies generally to breaches of any legislation and rules made under legislation which cause or are likely to cause harm to the environment. Under this provision, it must be shown that there is at least a threat of 'harm to the environment'. In practice, however, this will not present a major obstacle because 'harm to the environment' is defined very broadly. In addition, the leave (permission) of the Land and Environment Court must be obtained. Before granting this, the Court must be satisfied that (EOPA s.25(3)):

- the proceedings are not an abuse of the process of the Court;
- the proceedings are in the public interest; and
- there is a real or significant likelihood that the requirements for the making of an order will be satisfied.

As this decision is made by the court, inappropriate obstacles do not appear to be in the way of proceedings. However, under the current provision, unlike specific provisions in other legislation, there is no power to make an order remedying, as distinct from restraining, breaches.

Recommendation 4.1: Section 25 of the Environmental Offences and Penalties Act should be amended so as to allow an order to be made requiring remediation of unlawful activity.

Stakeholder Representation in Decision-Making Processes

Exhibition and comment provisions only require that comments be taken into account, not that they be necessarily incorporated in decisions. Stakeholder misunderstanding of this position has led to increasing dissatisfaction with exhibition and comment provisions. In its search for an alternative, the Department of Land and Water Conservation and State Forests have turned increasingly to another model of public

participation which allows stakeholder representatives to participate at an early stage in the decision-making process, with the aim of achieving negotiated outcomes, while still leaving the final decision on whether to approve a strategic plan with the Minister. This is the approach taken under the Native Vegetation Conservation Act, where regional vegetation committees will play a major role.

However, this approach may give rise to concerns about the representativeness of the stakeholders invited to participate.

The Native Vegetation Conservation Act aims to achieve a balance between conservation and rural interests on Regional Vegetation Committees (RVCs) by including two representatives to be nominated by the New South Wales Farmers Association. However, it has been suggested that a relatively small proportion of rural ratepayers are members of the New South Wales Farmers Association. One alternative would be to include elected rural representatives on Rural Lands Protection Boards (RLPBs) on RVCs. They are democratically elected by all ratepayers, the Boards have existing responsibility for management of 2.7 per cent of the State's land area and a higher proportion of vegetation remnants on rural areas, and many Rural Land Protection Boards have established relationships with landcare groups, pest and weed control authorities, and roadside vegetation conservation groups.

There are lessons to be learnt from experience with Catchment Management Committees and Trusts. Under the *Catchment Management Act 1989*, Committees and Trusts must comprise a majority of landholders or land users in the area, in addition to representatives from those having an interest in environmental matters, local government and officers of government departments responsible for resource use and management. The requirement for a majority of landholders is widely regarded as having undermined the credibility of Catchment Management Committees in the eyes of some groups, and led to their increasing marginalisation when it comes to allocation of critical decision-making responsibilities.

Apart from the question of representativeness, there is some concern that community-based consultation at the local community level will not give adequate attention to the limits placed on development by the biophysical environment, particularly the need to conserve biodiversity, but

will place much greater weight on socio-economic considerations.

Recommendation 4.2: The expert working group acknowledges the benefits of direct stakeholder participation in negotiated outcomes. The opportunity for public comment in decision-making processes should be focussed at the strategic planning level, for example:

- environmental planning instruments (including regional vegetation management plans);
- strategic management area plans (including both forest and park management plans); and
- cross-tenure threat abatement and species recovery plans.

Greater attention should be given to ensuring that those nominated to membership of consultation committees adequately represent stakeholder interest.

Regional managers should negotiate with Aboriginal groups on the most appropriate ways for them to contribute to the formulation of strategic plans.

Opportunities for public participation at other levels should be confined to situations where there is likely to be a significant effect on the environment and where decision-making processes have not been properly implemented.

In order to facilitate the regional forest agreement process and forest management after agreements are negotiated, ongoing formal processes (such as regional forest forums) need to be strengthened to raise awareness and understanding of ecologically sustainable forest management and how it can be achieved in New South Wales forests.

REQUIREMENTS AND INCENTIVES

Getting the Right Balance

Ecologically sustainable forest management Principle 3 requires that governments ensure that legislation, policies, institutional framework, codes, standards and practices related to forest management require and provide incentives for ecologically sustainable management of the native forest estate. This raises the crucial issue of the appropriate balance between carrot and stick – between economic instruments and command and control regulation.

The reluctance to confront this issue at a policy level is a recurring theme in broad policy

statements, resulting in an ad hoc, poorly coordinated approach across legislation.

The *National Forest Policy Statement* 1992 adopts the kitchen-sink approach, providing that strategies available for use by the States in achieving ESFM:

...may involve controls over land clearing and/or land use covenants between landowners and Government or mechanisms to encourage retention of native vegetation. This may include legislatively backed controls (p 27).

Similarly, the *National Strategy for the Conservation of Australia's Biological Diversity* 1996, gives no clear lead to jurisdictions as to the appropriate balance between regulation on the one hand, and approaches based on incentive and agreement on the other, in seeking to induce private landholders to manage their land in a manner which is sympathetic to biodiversity conservation. There is a commitment to negotiating heritage agreements (para 1.5.1), and commitment to 'controlling broad-scale clearance' (3.2.2).

The most recent version of the Joint ANZECC-MCFFA NFPS Implementation Subcommittee (JANIS) document on the CAR reserve system (JANIS 1997) makes no mention of regulatory approaches and emphasises 'the development of incentives for the establishment of mechanisms to ensure protection, such as covenants on leasehold and freehold lands' (para 4.2). The reality is, however, that strategies which rest on voluntary cooperation will not provide a viable alternative to land-use regulation, including clearing controls, unless significant financial resources are committed.

There should be clear acknowledgment of the limitations of different strategies. In the absence of accompanying incentives, regulatory strategies may only serve to alienate landholders, and cause consternation in agencies which have no law enforcement tradition. On the other hand, strategies based on voluntary agreement may not encourage cooperation from particular landholders because the incentives offered are not sufficiently attractive. Where ecologically sustainable forest management requires significant restrictions on productive use of land, one approach would be to combine land-use regulation with the provision of incentives for active management of the land.

Regulatory Failure?

There are extensive provisions in New South Wales law to regulate private and public land use in the interests of biodiversity conservation and land and water conservation, thereby putting in place requirements. At the same time there is substantial evidence of failure in implementation, at least insofar as conservation on private land is concerned.

In the first place, command and control regulation rarely, if ever, completely prohibits activities. It nearly always provides for exceptions to prohibitions to be made on a case-by-case basis through licensing, consent, permit, etc. processes. As a result, decisions are simply delegated to decision-makers who make decisions on the merits of particular proposals in light of the factors spelt out in ecologically sustainable forest management Principle 1. There is nothing in the existing legislation or practices of the courts to guarantee that these factors will in any sense be given even equal weight: what weight they are given will depend on the values of the particular decision-maker.

Secondly, regulatory approaches which require private landholders to act against what they are likely to see as being in their economic interests depend substantially on vigorous enforcement for their effectiveness. In practice, there is evidence on the part of some government agencies of a failure of will at this level. Quite apart from this, agencies simply do not have the resources to pursue such a policy. Enforcement of environmental criminal law by specialist agencies is in practice fundamentally different from the enforcement of other areas of criminal law by the police.

These comments should not be taken as endorsing the use of command and control regulation of private landholders, but simply as pointing to the fundamental divergence between the law as it appears in Acts of Parliament and as it is administered on the ground. Legislation raises unrealistic expectations on the part of the community which are undermined in day-to-day administration. This leads to a lack of transparency. The question that needs to be answered is whether any function is served by legislation for which there is no commitment to enforce. If the function of particular legislation is essentially symbolic, then this should be made clear to the community.

One way of dealing with this question is the issuing by agencies of prosecution guidelines,

such as those issued by the Environment Protection Authority (*EPA Prosecution Guidelines*, August 1996).

Where prosecutions can be undertaken through more than one piece of legislation by more than one body (for example, The Native Vegetation Conservation Act and the Threatened Species Conservation Act), there are no clear lines of responsibility.

Some agencies clearly feel uncomfortable with their law enforcement role in relation to private landholders. There is necessarily a tension within those agencies whose cultures are based on cooperation rather than confrontation: for example the extension arm of what used to be the Soil Conservation Service and the role of the National Parks and Wildlife Service as park manager, as distinct from off-park enforcer.

The National Parks and Wildlife Service has the power under the Threatened Species Conservation Act to nominate particular 'routine agricultural activities', ordinarily exempt from the regulatory provisions of the legislation and to subject them to regulation. However, recent preliminary proposals by the Service to regulate commercial bush-rock removal, commercial dead timber removal, activities interfering with water flows to wetlands and pesticide and herbicide application on private land met with such hostility in community consultation exercises that the Service has decided that it would be preferable to pursue an educational and incentive-based strategy rather than relying on regulation. In fact, bush-rock and dead timber removal almost certainly do not fall within the definition of routine agricultural activities, and as a result they are prohibited, unless licensed, where removal would cause damage to the habitat of a threatened species (National Parks and Wildlife Act s118D). There is a clear tension here between the formal pronouncement in the legislation, the expectations that this creates in certain section of the community, and the enforcement policy pursued by the particular agency.

Recommendation 4.3: Legislation should provide clearer guidance to enforcement agencies on the implementation of regulatory requirements. See, for example, *Soil Conservation and Land Care Act 1989*, s 29(1)(c) (SA), which provides that one of the functions of a soil conservation board is to 'implement and enforce this Act within its district and to endeavour to do so as far as

possible on the basis of first seeking the co-operation of owners of land within the district'

The Need for Incentives

Government needs to give careful thought to the appropriateness of using sticks without accompanying carrots, particularly where the activities of rural landholders are concerned. Enactment of symbolically impressive legislation is inexpensive and may serve short-term political interests, but it is unlikely to achieve ecologically sustainable forest management unless it is accompanied by incentives, particularly in areas where its effect is to substantially restrict development on land in private ownership. The reality is that regulatory strategies which require the auditing of compliance across large areas of rural land in small communities which are not convinced of the benefits of regulation are unlikely to succeed. The danger is that such strategies will alienate rural landholders in a context where conservation cannot be achieved simply by imposing restrictions on land use. Biodiversity conservation requires active management of the land. Regardless of whether command and control regulation is effective in restricting land use in the interests of conservation, it is certainly of limited utility when it comes to persuading private landholders to carry out positive management activities, as distinct from restricting land uses.

It is cheap but inefficient to set up command and control regulatory regimes relating to private land. In practice, these are substantially symbolic because inadequate resources are devoted to providing decision-makers with background information through the strategic planning process, to auditing compliance, and to providing incentives for active management. There is some evidence that this has happened in the past in New South Wales.

The more recent focus on strategic planning through the RFA process and proposed regional vegetation management plans, and the greater emphasis given in the Native Vegetation Conservation Act to funding the active management of native vegetation on private land, through property agreements and the native vegetation management fund, are encouraging developments.

Incentives are particularly crucial where private landholders are involved, and where active management is required, going beyond land use restrictions. Active management of the land, for

example, for biodiversity conservation purposes, will not be achieved through command and control regulation alone. The National Forest Policy Statement committed governments to 'develop a range of incentives and programs to promote sustainable management of native forests on private land designed to ensure active management of private native forests for both ecologically sustainable wood production and nature conservation' (p 27).

Types of Incentives

Incentives can be delivered through targeted voluntary agreements with individual landholders or offered generally through the tax system. An example of the latter is found in section 75D of the *Income Tax Assessment Act 1936*. This allows an income tax deduction in the year of expenditure for the capital cost of operations designed, among other things, to prevent land degradation on areas not currently affected. Land degradation includes the degradation of natural vegetation. This would allow a deduction to be claimed, for example, for the erection of fences to exclude stock and pests from particular areas. The approach taken in section 75D is designed to deliver land conservation as distinct from biodiversity conservation. Apart from this, the general offer of incentives through the tax system does not permit the more careful targeting required where biodiversity conservation is the objective. A review of section 75D in 1994-5 was promised in the National Forest Policy Statement, but does not appear to have taken place.

Recommendation 4.4: Section 75D of the Income Tax Assessment Act should be reviewed as a matter of urgency, with a view to making it more sensitive to the needs of ecologically sustainable forest management.

Individual agreements between landholders and government represent a more carefully targeted approach. Under the Soil Conservation Act 1938, the Minister for Land and Water Conservation can make advances to landowners to enable them to carry out works 'necessary to ensure the conservation of the soil of those lands, the mitigation of erosion or the conservation of water resources'. This narrow conception of land degradation would not allow advances to be made for biodiversity conservation. Apart from this, advances must be repaid with interest.

Under the National Parks and Wildlife Act's section 69B, the Minister for the Environment can enter into Voluntary Conservation Agreements

with landholders for a wide range of nature conservation purposes. In return for the landholder agreeing, for example, to restrict land use, refraining from carrying out certain activities or agreeing to carry out specified activities, the Minister can provide assistance and technical advice, including financial assistance. Recent amendments to the *Local Government Act 1993* exempt land under conservation agreement from local government rates.

Conservation agreements run with the land, in the sense that they bind those who purchase the land in the future (National Parks and Wildlife Acts s69E). In practice, however, relatively few agreements have been reached. An important factor here has been the lack of resources available to the National Parks and Wildlife Service to negotiate these agreements, and to provide even the minimal inducements required by landholders who have a commitment to nature conservation. The expert working group was told that there were eleven expressions of interest in entering into conservation agreements in the Eden area, but only sufficient resources to process two each year. One difficulty with reliance on Voluntary Conservation Agreements is that they may not reflect the Service's priority areas for land acquisition. Management and pursuit of Voluntary Conservation Agreements in areas of low conservation significance may not be an appropriate use of valuable conservation resources.

Under the Native Vegetation Management Act, money may be allocated from the Native Vegetation Management Fund to provide financial assistance to landholders who are prepared to enter into voluntary Property Agreements (PAs) which identify protected areas of vegetation and agreed methods and practices of vegetation management. PAs will run with the land, so as to bind successors in title if they are registered. There is no clear indication, however, of precisely what form the financial assistance will take. In terms of attractiveness to landholders, for example, there is a big difference between payments for fencing to protect sensitive areas and stewardship payments for active management.

In addition, there is no commitment to providing incentives to all of those who are restrained from clearing native vegetation under the provisions of a regional vegetation management plan, and denial of development consent. A commitment to provide management incentives to all those restrained from clearing and prepared to enter into a Property Agreement would draw a close

connection between carrot and stick, and avoid perceptions of unfairness, while still making it clear that incentives were for active management, and not paid as compensation.

Removing Disincentives

When we turn from conservation forests on private land to production forests, the market already supplies significant incentives. In this context, a crucial issue is the removal of *disincentives* which discourage ecologically sustainable forest management practices. The National Forest Policy Statement (p 27) recognises that the removal of disincentives can itself provide effective incentives.

The Industry Commission has found evidence of a number of disincentives to growing trees for timber production. Consequently, 'decisions on vegetation management by agricultural and pastoral landholders are being driven primarily by the potential to increase returns by expanding grazing and conventional cropping activities' (Industry Commission, Inquiry into Ecologically Sustainable Land Management, Draft Report, Chapter 12). The disincentives listed include:

- the absence of a separate tenure for trees growing on land which would allow them to be sold independently from the land;
- potential double taxation of forestry profits;
- uncertainty about rights to harvest, stemming from changing environmental considerations; and
- pricing policies of Government forestry agencies, which may result in prices charged not reflecting the costs of supply.

Note, in relation to the third of these points, that in New South Wales, special legislation, the *Timber Plantations (Harvest Guarantee) Act 1995*, has been enacted to give greater security in relation to harvesting rights to owners and managers of timber plantations which have been accredited, but this does not apply to non-plantation native forests managed for wood production on private land. In relation to the second point, the National Forest Policy Statement committed the Commonwealth Government to a comprehensive public ruling by the Australian Tax Office clarifying the taxation treatment of native forests and plantations used for commercial wood production.

Recommendation 4.5: The final recommendations of the Industries

Commission relating to the removal of disincentives to private forestry should be reviewed with a view to their immediate implementation.

THE PRECAUTIONARY PRINCIPLE

The precautionary principle provides the primary incentive for survey and research to remove uncertainty from impact assessment and mitigation. The precautionary principle has particular relevance:

- where surveys for identification of threatened species, populations and communities affected by activities have been inadequate;
- where scientific knowledge is unable to predict the magnitude and importance of impacts;
- when setting minimum targets for reservation and retention to ensure long term viability; and
- when setting codes of practice to ameliorate poorly known impacts.

Commonwealth and State Governments have made much of the precautionary principle as one of the key principles of ecologically sustainable development. It has appeared in a number of broad policy statements, in particular, the National Strategy for Ecologically Sustainable Development (1992, p 8) and the National Strategy for the Conservation of Australia's Biological Diversity (1995, p 5). It also appears in the Intergovernmental Agreement on the Environment (IGAE) (para 3.5.1) and the National Forest Policy Statement. Two pieces of Commonwealth legislation specifically embrace the precautionary principle, including the *Great Barrier Reef Marine Park Act 1975*, which requires management plans to be informed by the principle (s 39Z(1)(b)). A number of others incorporate a general reference to the concept of ecologically sustainable development in, for example, provisions delineating the objects of legislation or objectives/functions of government agencies. This includes the *Endangered Species Protection Act 1992* (ss 32(3)(c), 34(3)(c), 60, 70, 81) which requires it to be considered in relation to the making of recovery plans, threat abatement plans, interim conservation orders, permanent conservation orders and impact assessment conservation orders.

The precautionary principle is now specifically incorporated into a number of pieces of New South Wales legislation, including the objects sections of the Environmental Planning and

Assessment Act and the Native Vegetation Conservation Act. Much of this is by cross-reference to the provisions of the *Protection of the Environment Administration Act 1991* (NSW). This provides that, in pursuing its objective of protecting, restoring and enhancing the quality of the environment of New South Wales, the Environment Protection Authority (EPA) must 'have regard to the need to maintain ecologically sustainable development'. The precautionary principle is one of the principles which can assist in the achievement of ecologically sustainable development. It is defined as follows:

[I]f 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.

Although the Environment Protection Authority has traditionally been principally concerned with issues of pollution control and waste disposal, it does have a broad brief, and this is reflected in its more recent involvement in the protection of instream flows and the licensing of logging in State forests in relation to water pollution. Moreover, the Environment Protection Authority has broad powers to become involved in the activities of other agencies. Under section 12 of the Protection of the Environment Administration Act it can ultimately issue directions to public authorities and local councils to do anything within their powers which will contribute to environment protection or to cease doing anything which adversely affects environment protection. Environment protection includes activities aimed at protecting, restoring and enhancing the quality of the New South Wales environment, having regard to the need to maintain ecologically sustainable development. This would allow the Environment Protection Authority to issue directions relating to the application of the precautionary principle.

A version of the precautionary principle also appears in Schedule 2 of the Environmental Planning and Assessment Regulation 1994, but it is directed to those responsible for submitting environmental impact statements rather than to those making decisions on whether to give approval after considering environmental impact statements. See also the National Parks and Wildlife Act, s 91CC(2)(b) (appeals against stop work orders); *Timber Industry (Interim Protection) Act 1992*, ss 4, 10(1) (strategies for promoting ecologically sustainable development in relation to logging operations).

There is still a considerable amount of uncertainty about the precise meaning of the precautionary principle in the context of biodiversity conservation, as distinct from pollution prevention and control where it has received most attention. In that context, the issue has frequently been whether measures should be taken against environmental degradation allegedly caused by ongoing activities, whereas in the biodiversity context much of the damaging impact is likely to come at the very beginning of proposed projects and is likely to be irreversible.

One matter which is clear is that the version of the precautionary principle which appears in the legislation does not give priority to conservation considerations over socio-economic considerations in situations where there is no scientific certainty.

In *Leatch v National Parks and Wildlife Service* ((1993) 81 LGERA 270), Stein J's adoption of a precautionary approach led him, on appeal, to overturn a decision of the National Parks and Wildlife Service to grant a licence to 'take' endangered species by destroying habitat to build a bypass. He believed that one permissible approach is to conclude that the state of knowledge is such that one should not grant a licence . . . until much more is known (at 284). He made it clear, however, that the decision could be reconsidered once adequate research into the presence of the Giant Burrowing Frog had been carried out.

In *Greenpeace Australia Ltd. v Redbank Power Company Pty Ltd.* ((1995) 86 LGERA 143), Pearlman CJ operated on the assumption that the precautionary principle was a relevant factor to be considered by the Land and Environment Court in determining a third party appeal on the merits against a decision by a local council to give development consent to designated development in the form of a power station which used coal washery tailing as a fuel. This decision is significant from the perspective of biodiversity conservation because a number of major initiatives in this context rely on the development consent process set up under the Environmental Planning and Assessment Act for their regulatory muscle, for example, the Native Vegetation Conservation Act.

Pearlman CJ in the *Greenpeace* case stated (at 154-155):

The application of the precautionary principle dictates that a cautious approach should be adopted in evaluating the various relevant

factors in determining whether or not to grant consent; it does not require that the greenhouse issue should outweigh all other issues. . . [It] should not outweigh all other factors relevant to a determination of whether or not to grant consent, but must be taken into account in the Court's overall assessment of the project.

The legislation under consideration in the *Leatch* case has now been amended by the Threatened Species Conservation Act. However, these amendments specifically incorporate the precautionary principle into decision-making processes. In deciding whether or not to licence damage to the habitat of an endangered species, population or ecological community or to give concurrence to other approvals where her concurrence is required, the Director-General of National Parks and Wildlife is instructed to take into account the principles of ecologically sustainable development, including the precautionary principle. The approach taken here is the same as that taken by Pearlman CJ: the precautionary principle is simply a factor to be considered alongside a number of other factors, including social and economic considerations.

The issue is, however, whether the principle is simply something to be taken into account, and perhaps overridden in the context of a particular proposal by pressing economic considerations, or whether it is a special approach to making decisions.

Two of the regulatory agencies interviewed specifically indicated that they applied the precautionary principle in the regulatory decision-making process: the Department of Land and Water Conservation and the Environment Protection Authority. In particular, the Environment Protection Authority indicated that it applied the principle when making decisions about the grant of pollution licences in determining areas where available evidence suggested that there was a high risk of erosion, and in determining management protocols in medium risk areas.

Questions which arise include:

- How should decision-makers deal with proposed activities where there is no scientific evidence of likely impact, for example, the effect of fire on a particular species of plant?
- Under what circumstances, if any, should a particular proposal be delayed while more scientific research is carried out?

- If the precautionary principle is read as requiring that more research should be carried out before a decision is made, does it have anything to say about how that research should be carried out – for example, the number and timing of surveys?

There are several well-established precautionary practices, including the following:

- automatic protection of habitats of rare and poorly known species in reserves or retained areas where development is prohibited;
- where surveys have been inadequate, threatened species are assumed to be present if populations are known from the surrounding region (for example, within 20km), as determined by the National Parks and Wildlife Service Wildlife Atlas records or the equivalent, and habitat present is potentially suitable for the species;
- where knowledge of impacts is inadequate a variety of methods are used, most commonly that a species will be impacted if the habitat or habitat components on which it depends are modified or removed (for example, if a species requires tree hollows, the removal of trees with hollows will have an impact). Where the essential habitat requirements of a species are not known (for example, foraging requirements of many frogs affected by logging and burning) and no expert is prepared to guess, the precautionary principle dictates that no disturbance of significant habitats (as determined on the basis of ecological and socio-economic criteria) should be permitted until science or monitoring has shown that the activity is unlikely to be harmful; and
- minimum targets for habitat area have been set using a variety of models designed to predict population and habitat viability. The predictions of PVA models are generally based on a combination of genetic theory, life history parameters and environmental disturbance risk. These models are theoretical, unvalidated and highly precautionary but are likely to remain in use until more suitable viability assessment models are developed.

The most appropriate way of avoiding the difficulties of applying the precautionary principle at the operations level is through comprehensive bioregional planning, involving adequate survey and conservation evaluation.

The creation of a CAR reserve system by preserving viable populations of threatened

species and communities in CAR reserves, where no knowledge of response to development is required is precautionary.

Under the Native Vegetation Conservation Act, one argument might be that, where there is some evidence of serious or irreversible environmental impact on biological diversity, regional vegetation management plans should defer identifying areas for clearing until adequate information is collected to allow the assessment of the impact on biological diversity.

Recommendation 4.6: Guidelines be prepared for interpretation and implementation of the precautionary principle for the delivery of ecologically sustainable forest management.

IMPLEMENTATION

INTRODUCTION

The systems and processes of forest management in New South Wales were assessed to determine their ecological sustainability. The assessment involved five State Government departments, State Forests of New South Wales, National Parks and Wildlife Service, Department of Land and Water Conservation, Department of Urban Affairs and Planning, and Environmental Protection Agency. A checklist prepared from the information contained in the project specification for the assessment of New South Wales management systems and processes for the delivery of ecologically sustainable forest management (dated 20 August 1997 and amended as necessary) was used to conduct the assessment. The process required discussions with executive and departmental managers, with field, zone and area staff and, with respect to State Forests, staff at Eden.

This chapter evaluates how the principles of ecologically sustainable forest management are applied within the departments and thus cumulatively across the State, identifies impediments to their implementation and suggests ways these impediments may be overcome.

DEPARTMENTAL SITUATION

State Forests of New South Wales

State Forests' role is primarily one of managing State forests as specified under the *Forestry Act 1916*. Consistent with the use of State forests for the purposes of forestry and of flora reserves for the preservation of native flora, the Act requires the service to conserve and utilise the timber on Crown-timber lands to the best advantage of the State; and to preserve and improve, in accordance with good forestry practice, the soil resources and water catchment capabilities of those lands. The service must also take all practicable steps that it considers necessary or desirable to ensure the

preservation and enhancement of the quality of the environment.

In addition to complying with the Forestry Act, State Forests must also comply with legislation such as the *Environmental Planning and Assessment Act 1979* (EP&AA) and the *Threatened Species Conservation Act 1995* (TSCA).

Because of its age, the Forestry Act makes no mention of the principles of ecologically sustainable forest management as such, but does include references to soil and water conservation, good forestry practice, the preservation of native flora and the preservation and enhancement of environmental quality. State Forests has responded to this legislative framework by developing mission, vision and values statements and an environmental policy. The latter contains a commitment to meeting legislative and regulatory requirements as well as implementing sustainable forest management. The policy mentions biodiversity, healthy and productive forests, heritage and cultural values, best practice and communication with relevant interested parties.

State Forests' commitment to its environmental and other statements is implemented through a corporate planning structure that identifies key result areas and objectives, such as 'sustainability in forest management through world's best environmental practice', and by defining 'the forest resource available for long term sustainable forest management'. These key result areas and objectives are supplemented by performance indicators and, in some cases, targets.

Although these ecologically sustainable forest management-related key result areas and objectives are set out in the corporate plan, under the current accounting system it is not possible to determine the level of resources allocated to or expended on their achievement. Some ecologically sustainable forest management-related components can be identified at district level through local accounting practices but these

practices are not consistent across all districts. Further, government policy may make it necessary for district offices to divert funds allocated to ecologically sustainable activities to other legitimate purposes, thus negating to some extent corporate objectives for ecological sustainability. This redirection of funds may be difficult to detect within the current accounting system.

Neither the corporate plan and its objectives nor the environmental policy are well supported by other policy statements. For example, there are no current statements relating to conservation, flora and fauna, water and soil management or the precautionary principle, although in the latter case this concept is defined in the *Protection of the Environment Administration Act 1991*, Section 6 (2). The absence of specific policy statements on these sustainability criteria has allowed the development of protocols and codes of practice at a functional, regional and/or district level. These protocols and codes do not necessarily meet the requirements of the criteria for ecological sustainability, or the intent of the corporate plan, although they may reflect a practical interpretation of what is required at district level.

Discussions with State Forests staff at all levels indicate that there is a lack of understanding of the common hierarchy of legislation, corporate and other policy, strategy (planning), operational and other processes, and audit and review. The links between these management system components and the way they comply with the organisation's environmental policy—and through it with the relevant legislation—are also not clearly understood. This lack of knowledge has led to management inconsistencies throughout the organisation. Some levels and locations have focused on producing planning documents while others have produced codes of practice and still others manuals and instructions. These documents have been produced in good faith and frequently have been developed in the absence of clear policy. Thus they reflect current practice rather than best practice. In addition, older documents such as the *Operations Manual*, remain in use in some locations in the absence of more up-to-date information.

This problem has now been recognised by senior management and plans are being made to strengthen the link between Government policy and the corporate plan. In addition, the absence of common core policies and strategies on a range of environmental and other issues has also been recognised and discussions with planning staff

have confirmed that action to rectify this problem has begun. This action is commendable; however, the long absence of such policies or the development of policies where none existed previously may lead to reluctance in the workplace to their acceptance unless the policies are formulated in consultation with staff from all levels in the organisation. It is also important that such policies be applied consistently and subjected to regular review.

The forest planning process has undergone numerous changes since forests were first identified and maintained as an asset under the Forestry Act. These changes have been introduced to meet both organisational (internal) and legal or political (external) needs. The current planning processes can broadly be defined as occurring at the following levels:

■ Strategic.

Management at this level includes:

- Area management plans, which were prepared in the context of the Forestry Act and other Forest Commission policies during the mid to late 1980s to manage the 67 forest areas into which the State was divided. These plans had an initial life of 10 years but have not been reviewed since the introduction of environmental impact statements.
- A map-based forest classification scheme which sets management priorities for particular forest areas and is overlaid on the area management plans.

■ Tactical (Operational).

Management at this level could be subdivided into:

- Environmental impact statements or assessments (EIS/EIA), to identify potential and actual effects of proposed forest (harvesting) activities. These assessments are largely driven by external legislation and last for a defined period;
- Reserve, Aboriginal place and other conservation management plans;
- Infrastructure plans associated with the development and management of roads and recreational facilities;
- Fire planning, which deals primarily with fire prevention and suppression;
- Annual plans of operations (order of working) for identified compartments

within management areas scheduled for logging; and

- Harvesting plans to manage and control harvesting operations within compartments.

Following the implementation of the Environment Planning and Assessment Act in 1992, a comprehensive assessment and review of the potential and actual impacts of forest operations was undertaken for the 14 forest areas where logging was scheduled to occur. This process was managed by a team of State Forests personnel supported by external consultants. During the current assessment of forest management for its ecological sustainability, a review of several of the environmental impact statements raised during that period revealed that the process used to assess environmental impact was not well documented. It is not possible to determine how the work was done or to assess the effectiveness of the review process. For example, perusal of some of the public submissions on the Eden environmental impact statement indicate that the internal review process was inadequate. Records offer no indication of the rationale behind the process or whether the same process was applied consistently across all environmental impact statement/assessment documents.

Prior to harvesting, district offices develop plans of operations based on a sustainable yield model developed by Margules in 1995. These plans are developed annually and no long-term, three–five year cutting plans were sighted. No procedure (the documented means by which policy is defined and standardised and a systematic method of performing specified tasks is established) is available to indicate how the plans are developed or whether yield is sustainable.

The requirements of the environmental impact statements/assessments are implemented through the harvest plan. Harvest plans are developed in accordance with Operational Circular 95/1 which refers to relevant legislation and the relevant environmental impact statement. Harvest plans call up relevant operating codes of practice, licence conditions (such as those associated with pollution control), and any other special requirements. The current edition of the operational circular does not refer to the Threatened Species Conservation Act but does refer to earlier similar legislation. The circular is comprehensive and calls for a mandatory field inspection to verify and refine the data. Harvest plans are also subject to public comment through the Harvest Advisory Board and some plans are

subject to a review by the Environment Protection Authority and the National Parks and Wildlife Service prior to implementation.

Licensed contractors (providers of raw materials, intermediate processing, equipment or services, etc.) undertake the logging. Their conditions of contract refer them to the harvest plan, State Forests' codes of practice and licence conditions. In accordance with the code of practice, contractors are also required to report any pollution they cause or encounter. Contractors' staff are required to be licensed for particular tasks and it is the responsibility of the supervising forester to ensure compliance.

No comprehensive approach to monitoring and measurement was apparent from a perusal of some harvest and management plans. For example, three-yearly and other management reports examined are of a very general nature and do not provide a specific assurance that licences or other conditions are being complied with. Further, there is no indication that harvest plans reflect changes that have occurred since the environmental impact assessment was completed or that changes in work practices are subject to formal review to determine whether they alter existing impacts or cause new impacts that warrant further protection measures and amendments to the plans.

Some monitoring and measuring is evidenced by harvesting inspection reports. However the reliability of these reports is suspect. For example, Section 2 Soil and Water Protection, 2., the term 'machinery encroachment' as written implies that a 'Yes' in the appropriate column means that encroachment has occurred whereas the checklist notes (Forest Practices Guidance Note 96/2) is worded so that a 'Yes' answer indicates that encroachment has not occurred.

Confirmation that legislative requirements or conditions of environmental impact statement determinations are being met is not readily evident and the identification of non-conformance with licence conditions or other regulations is not well controlled. Although it is evident that incidents of non-conformance are identified, they are not always documented and thus it is not possible to determine whether corrective and/or preventive action had been taken or was effective.

With respect to the five principles of ecologically sustainable forest management, State Forests is not able to document that it is meeting the requirements of sustainable development as defined in its corporate plan, or that conditions of

environmental impact statement determinations are being achieved. Principles 1 and 4 are addressed to some extent in the 14 environmental impact statements, Principle 2 is addressed through legislative requirements and is also evident through State Forests' external communications activities, Principle 3 is addressed through legislative requirements and Principle 5 is outlined in the various codes of operating practice developed and promulgated by State Forests.

State Forests is a traditional organisation with a significant number of long-serving staff who have made forestry their life. This has led to a high level of regional/district autonomy and until recently has meant that the organisation was operationally focused rather than policy focused. Since the early 1990s, political and legislative changes have resulted in a more policy-driven organisation, a change that is reflected in corporate plans, more detailed planning, greater public consultation, the development of codes of practice and the conduct of internal audits. Despite these changes, the organisation is still largely reliant on the knowledge and experience of its employees, especially those in the field. Unless an effective environmental management system is put in place, State Forests will continue to be unable to demonstrate its ability to meet its own environmental policy.

National Parks and Wildlife Service

The National Parks and Wildlife Service has both a regulatory and managerial role under the legislation that it administers. This legislation is contained in the *National Parks and Wildlife Act 1974*, *Wilderness Act 1987*, and *Threatened Species Conservation Act 1995*. The service also has a role under the *Environmental Planning and Assessment Act 1979*.

The Acts the service administers make no reference to the five principles of ecologically sustainable forest management referred to earlier. However the Threatened Species Conservation Act and the Environmental Planning and Assessment Act do go some way towards addressing the principles. These Acts both refer to ecologically sustainable development.

The service has responded to its legislative and managerial responsibilities by developing a mission statement, which is:

Working with the community to conserve and foster appreciation of nature, Aboriginal

heritage and historic heritage in New South Wales.

The mission is being implemented through the development of a corporate plan that has five key program areas, as follows:

- Conservation policy, assessment and planning
 - Policy
 - Resource assessment and planning
 - Research survey and information
- Protection of conservation assets
 - Nature conservation
 - Aboriginal heritage conservation
 - Historic heritage conservation
- Promotion of conservation
 - Park facilities and services
 - Community relations and education programs
- Regional park management
 - Regional park management
- Service wide support and development
 - Government liaison
 - Finance and business coordination
 - Managing for performance.

The definition of terms such as biodiversity, nature conservation and ecologically sustainable development in the corporate plan are not necessarily aligned with definitions of the same terms in other documents.

The key program areas are supported by some 57 lower order objectives and targets. With respect to ecologically sustainable forest management these include:

- Implement the National Biodiversity Strategy through the development of a State Biodiversity Strategy, March 96;
- Providing service input into the development of model forestry management plans to assist in achieving ecologically sustainable forest management, May 96;
- Identifying, in consultation with other agencies, particularly the Department of Urban Affairs and Planning and the Resource Conservation Assessment Council, ways in which the service can pursue an ecosystem

management approach to environmental planning and management, May 97;

- Developing and coordinating a State-wide endangered species conservation program, including recovery planning and necessary research and surveys, July 96.

The corporate plan is implemented through a strategic management cycle which aims to ensure that the plan is funded and is subject to monitoring and review. Examples of this appear in the 1996 update to the corporate plan, which reports on progress in implementing the plan. Contributions to the strategic management cycle come from the head office functional directorates of corporate services, policy and planning, legal, operations and technical services; from regional and district offices in relation to park/reserve management; and from zones in terms of managing on and off park legislative requirements.

Corporate plan objectives are, in part, supported by a policy framework defined in a series of documents. These include a document on environmental planning and assessment (in draft form), which provides guidance on the Environmental Planning and Assessment Act; Threatened Species Management Circulars and an internal Threatened Species Management Procedures Manual and Wilderness (draft) manuals relating to law enforcement and public enquiries, and manuals concerning concessions and leases. Other more internally focused manuals are available on dangerous goods, staff safety, infectious (human) diseases, staff development, contract management and human resource management.

Perusal of these manuals indicates that during the late '80s to early '90s there was a strong focus on policy development, initially related to staff management and associated issues. More recent documents reflect concern for environmental issues such as wilderness, vertebrate pests, threatened species, etc. However a number of manuals written between 1989–93 may well be out of date in not reflecting subsequent policy changes. In addition, distribution and updating of manuals is not controlled, so the degree of use either in the field or head office could not be determined.

The National Parks and Wildlife Service has plans of management relating to those assets for which it is responsible. The plans sighted, including those for the Kosciusko, Lane Cove and Marramarra National Parks, and Bungonia State

Recreation Area, varied in content. The Kosciusko plan is a comprehensive document that includes management functions whereas the remaining plans are more focused documents and exclude this section. The more modern plans sighted include references to biodiversity, heritage values, soil erosion and water quality, and threatened species in the context of ecologically sustainable forest management.

The process for developing a park or reserve plan is documented in a procedure held by Field Services Division and available on request to the individual developing the plan. The proposed plan is based on a 'model' that is intended to provide consistency in the plan development process. The internal process by which this consistency is achieved is not well documented. An outline of the process is available but its existence is not promulgated. The content of the document containing this outline is not prescriptive and offers little guidance on how to write a plan. No verification process is evident and although plans are subject to a detailed review within Field Service Division and the results of reviews are well documented, the process itself is not included in the process outline.

Plans of management contain implementation objectives but no targets. Each plan is accompanied by a financial impact statement that contains details of the cost of its implementation in terms of both capital and recurrent expenditure. Plans are implemented through a district's annual program. Implementation is subject to the availability of both funding and staff. There appears to be no requirement within specific plans or the 'model' plan to monitor or report compliance either with the implementation process or with the content of the plan. The process includes public involvement in the development of the plan and also public exhibition of the plan prior to seeking ministerial approval and adopting the plan.

Concern with the current planning process is evident within the service and a review has been initiated with the objective of improving the process. A project brief has been prepared and the review is in progress. The elements of the review are wide ranging and include such requirements as benchmarking current practices in other States, public involvement in plan preparation, assessing the effectiveness of the public exhibition process, and plan content. However, the process does not appear to include an examination of the planning process itself in terms of documenting and managing the process, financing the plan and

monitoring the plan's effectiveness as both a short and long term instrument in park/reserve management.

A review of head office policies and manuals did not reveal a risk assessment policy or strategy. Discussions with regional staff indicated that risks associated with fire or pest management are evaluated from historical information, and are not consistent between region/districts. The Threatened Species Conservation Act contains some consideration of risk assessment in terms of identifying threatening processes.

Discussion with staff confirmed that with respect to ecologically sustainable forest management there is little direct evidence to demonstrate that the service is implementing ecologically sustainable development. Staff stated that such implementation is executed as a matter of course in their approach to park/reserve management. As evidence of this commitment, staff cited compliance with the Threatened Species Conservation Act and the Environmental Planning and Assessment Act with respect to fire management (through the development of a fire management protocol), the issues addressed in the plans of management for parks/reserves, the development and use of survey design protocols for pre-logging and pre-roading, and a jointly developed conservation protocol for timber harvesting on State forests land.

To demonstrate compliance with the principles of ecologically sustainable forest management or ecologically sustainable development it is necessary to demonstrate the level of expenditure committed to achieving such an outcome. Such information would allow a value judgement to be made in terms of the short and long-term effectiveness of current management strategies. Using the service's current accounting system it is not possible to identify accurately the funds allocated or expended on the maintenance of ecologically sustainable development or its key components. The service is purchasing an asset management system which may enable it to better identify such funds.

Under the current organisational structure, zones manage the on and off-park regulatory requirements administered by the National Parks and Wildlife Service. Zones receive and implement assessments and species impact statements under the Threatened Species Conservation Act and issue Section 90 consents as required. In these circumstances the service is required to take into account the precautionary

principle and the principles of ecologically sustainable development. These activities are performed in accordance with the Environmental Planning and Assessment Act and manual and the Threatened Species Conservation Act Manual.

With respect to the principles of ecologically sustainable forest management, the National Parks and Wildlife Service is not able to document effectively that it is managing the forests in an ecologically sustainable fashion. .

Despite identifying biodiversity, natural and cultural heritage values, soil and water and ecosystem health and vitality as significant issues, these aspects are not monitored in a way that demonstrates managerial compliance with Principle 1. With respect to Principle 2, the service is largely governed by regulatory processes; compliance with those processes, and therefore with Principle 2, can be demonstrated. In the same manner, the service can exhibit some compliance with Principle 3, as a result of compliance with regulatory requirements and with part of Principle 4, again in terms of compliance with the Environmental Planning and Assessment Act and the Threatened Species Conservation Act. Compliance with Principle 5 is hard to determine and there is no indication that this principle is actively considered by the service.

The National Parks and Wildlife Service is an organisation with a strong corporate policy focus supported by plans of management at park/reserve level. The organisation is sustained by competent and experienced staff. However the reliance placed on the knowledge of these staff, coupled with an absence of documented procedures to manage critical processes—including the monitoring of effectiveness and performance—leave the service vulnerable, as it would be unable to demonstrate compliance with particular legal or other requirements either to the courts or in the public domain should it be necessary to do so.

Department of Urban Affairs and Planning

The principal Act administered by the Department of Urban Affairs and Planning is *The Environmental Planning and Assessment Act 1997*. This Act contains three principle objectives, one of which has seven parts which could be considered at a broad level to encompass the principles of ecologically sustainable forest management.

In its corporate policy statement the department defines its role as follows:

To set the environmental planning framework for NSW and to plan, develop and implement environmental housing and urban and rural policies and practices that promote the sustainable management and use of land and other resources.

The department is composed of five divisions that reflect those of its functions that are directly relevant to this study namely, State and regional planning, housing and metropolitan, environmental policy and assessment, corporate management and resource and conservation. It has other functions but these are not directly relevant to this study.

The corporate plan contains a series of goals, outcomes and key actions that are intended to encompass the objectives contained in the Act; however, the alignment of these aspects of the corporate plan with each ecologically sustainable forest management principle is not explicit. The corporate plan is also broadly linked to the annual budget based on funding bids for key action items and varies from year to year in the weighting it gives to the specific objectives of the Act.

The objectives in the Act are implemented by a range of mechanisms, including policies, environmental planning instruments (such as local and regional environmental plans and State Environmental Planning Policies[SEPPs]), directions under Section 117, strategies, management plans, environmental assessment and co-ordination, and liaison/negotiation processes with stakeholders.

The Act and associated regulations define the processes for plan preparation and environmental impact assessment. However, no associated procedures setting out the process to be followed in decision making were sighted. For example, while the process for reviewing the environmental impact statements prepared by State Forests was described effectively (Schedule 2 of the Regulations and Directors General's requirements), there was no documented procedure available to indicate that reviews could be performed with consistency.

In situations where the Minister or the department is the consent authority for development, no systematic audit process takes place to ensure either compliance with the requirements of the Act or the effectiveness of the outcome except with respect to SEPP (State Environmental Planning Policy) 34, where consent conditions issued under Part 4 of the Act have been audited. In all other cases, reliance is placed on members

of the public or other environmental interest groups for ensuring that consent requirements are being met. Approvals under Part 5 of the Act are made to the determining authority, which in the main is State Forests, and it is that organisation's choice as to whether the approach is implemented.

The department may prepare environmental planning instruments for controlling development, protecting the environment or for conservation purposes under Part 3 of the Act. These may include local, regional or State environmental plans or policies. Guidance material is available for the preparation of local environmental plans, e.g. best practice notes and circulars to Councils, and environmental planning instruments (EPIs) are prepared in accordance with processes set out in the Act.

Local environmental plans generally provide the framework for development in local government areas and as a requirement under the Act must be reviewed by Council. The Act also requires the department to undertake regular and periodic review of regional environmental plans and State environmental planning policies. However, the review period is not nominated and even when a review is commenced it may take years to complete. Regional environment plans are generally only reviewed in changed circumstances. Ministerial consent of local and regional plans is required and the form, content and structure of regional plans and State environmental planning policies are also determined by the Minister. The department assesses local environmental plans for consistency with State regional planning policies for the Minister's consideration when deciding whether to make a local environmental plan. However audits of local and regional plans to gauge compliance are not performed.

Guidelines to help various industries prepare environmental impact statements and undertake environmental impact assessments have been prepared. In addition, there are specific guidelines relating to economic effects and evaluation in environmental assessment and to ecologically sustainable development in environmental impact assessments.

The objectives of the Environmental Planning and Assessment Act require the provision of opportunities for public involvement and participation in environmental planning and assessment. The department ensures this occurs with both statutory and non-statutory documents, although the Act only specifies details for

statutory documents. Various communication mechanisms are used including exhibitions, community consultation focus groups, public meetings and stakeholder steering committees—some of which are given statutory effect—local government liaison committees, and committees set up under Section 22 of the Act. However no policy was sighted regarding external communication on non-statutory documents. Various mechanisms may be used to obtain public consent where significant issues are to be considered but this is not reflected in policy.

No internal communication policy was sighted; however, regular staff meetings, technical and training seminars and monthly executive and manager planning policy forums are held, which confirm that communication is taking place. There is also a broad distribution of policy and procedural documents.

An organisation chart was noted and position descriptions sighted although these did not assign general environmental responsibility. An induction training program was evident and a performance appraisal system that enables the identification of individual training requirements has been established. A skills development package addressing record keeping is being developed. The record keeping function is currently outsourced to the centralised corporate services section.

Department of Land and Water Conservation

The Department of Land and Water Conservation was formed in late 1995 from an amalgamation of the former Department of Conservation and Land Management, Water Resources and the Water Services Policy Division of the Department of Public Works. The current department administers 37 major Acts, has 4000 staff spread over eight regions, and two head office locations, one in Sydney and one in Parramatta.

The department has a vision statement 'To achieve clean, healthy and productive catchments for the twenty first century'. It has not developed a corporate plan but has identified four key result areas:

- Information and knowledge base;
- Security of access to resources;
- Healthy and productive ecosystems;
- Community awareness and responsibility for natural resources.

Each of these key result areas is subdivided into future directions and key performance targets.

The department has recently revisited its vision statement together with its purpose, strategy, core values and key result areas. In 1998 a new corporate direction will be taken, together with the full implementation of the department's restructure.

The department is currently divided into functional divisions responsible for: strategic services, regional and commercial services, natural resource management including information management and technology, corporate services and a small group made up of other functions such as internal audit, etc. At the time of interview, no statement of responsibility could be located for each division and beyond the senior management level position descriptions had yet to be developed. Under recent changes brought about by the department's restructuring process, most of the five divisions now have developed statements of responsibility for their constituent branches. Financial recording is to be based on functional lines and programs where identified, and cannot be related to ecologically sustainable forest management as such, except in the case of specific programs.

As part of broader government change, the department or its antecedents went through a regionalisation process in the late '80s and early '90s that allowed inconsistencies to develop in both organisational structure (different between regions and head office) and work methods. As a result of these inconsistencies and the subsequent amalgamation process, the department was still in a state of significant flux at the time of interview. The recent restructure has addressed some of the inconsistencies between regions.

The department has managerial responsibility over Crown land, which constitutes 55 per cent of all public land in New South Wales. Some of this land is subject to exclusive leases or non-exclusive licences. The number of leases and licences is known but it is not possible to determine readily the land area associated with each of the licences/leases. The remaining land (that is, crown land not covered by leases or licences) is made up of areas that are reserved or dedicated and managed under a trust structure; lands not claimed by others; and leased land where the owner has a right to purchase but has not exercised the option.

In terms of forest management, these lands are managed under the following Acts:

- *Crown Lands Act 1989* and regulations (1995)
- *Water Administration Act 1986* and the *Water Act 1912*
- *Soil Conservation Act 1938*
- *Western Lands Act 1901*
- *Environmental Planning and Assessment Act 1979*
- *Total Catchment Management Act 1989*
- *Native Vegetation Conservation Act 1997*

Discussion with departmental staff revealed an absence of policy documentation with reliance being placed on the Acts or associated white papers to set policy. A policy dossier which will provide detailed documentation on all departmental policies is currently in preparation, and a standard process for the development, review and promulgation of policy documents has been introduced. Departmental policies may be found in the Summary of Affairs, which is published annually in the Government Gazette under the Freedom of Information Act. This listing includes current strategic policies, operational policies, manuals, guidelines, strategies and management plans.

A plethora of documentation was evident, largely based on past functions, but there was little evidence to indicate an awareness of the documentation or that it is being followed. The following documents were noted during the visit:

- Office Practice Guidelines: Crown Land Management dated 1990. More recent and more up-to-date copies of this three-volume set were sighted during visits to other departments.
- Handbook of Trust Management of Reserves and Dedicated Crown Land dated 2/95.
- Accounting Procedures Manual, part of a four-volume set, dated 1997.
- Communication Pack, dated 1997.
- Land Assessment Process for Crown Land in New South Wales (Draft), dated 8/95.

Very few documents are subject to any form of document control, no list of document holders was evident and most publications sighted were not amended. Some publications contained draft material which had been issued 'informally' while waiting for formal consideration. In one case related to environmental considerations, this situation had pertained since 1991.

Crown Land is subject to an assessment process prior to allocation and management. A Draft Land Assessment Process for Crown Land has been developed and promulgated. However, discussions with staff indicated a lack of understanding of the parallel nature of the requirements of Parts 4 and 5 of the Environmental Planning and Assessment Act, with few if any leases or licences having been subject to consideration of the environmental impacts of the proposed activity, or subject to consideration under Part 4 of the Act as a development activity. The recent development of guidance notes in the form of memorandum may overcome this problem.

Current licence and lease conditions are strongly commercially oriented. Environmental considerations are largely limited to compliance with the relevant soil conservation, pollution prevention or land clearing laws, and are scattered throughout the documents.

With respect to reserves and dedicated lands, plans of management may be required by the Minister and guidance material for these have been developed and published in the Land Management Manual in 1993, part of which has been revised and issued as *Succeeding with Plans of Management*, dated March 1996.

Environmental assessments for cultivation and clearing of land in the Western Division of New South Wales are undertaken during the licensing procedures. The Western Lands Act, however, does not require an assessment of the kind required under the Crown Lands Act. Leased land sizes are, however, far larger than those in the other areas of the State and the Mines Act allows mining leases to be issued. No policy guidance is available on lease conversion.

Information on the application of the Water Act was obtained from a guide on Environmental Review under the Water Act. The major environmental concern in the guide seemed to be the amount of water extracted and how this might affect biodiversity and the ecosystem in general.

With respect to ecologically sustainable forest management, current legislation is old and contains or refers to some requirements but does not include incentives as mentioned in Principle 3. Principle 4, the precautionary principle, is allegedly applied but the process of when or how this is done is not well documented.

The Water Act, in relation to diversion of water, on-stream storages and pumping from rivers, is

considered largely irrelevant to forestry operations. It may be, however, that the department is not made aware of forestry works which require licences.

In terms of clearing native vegetation, the department is also a consent authority under the Environmental Planning and Assessment Act in accordance with State Environmental Planning Policy No. 46.

The recently introduced *Native Vegetation Conservation Act 1997*, is intended to achieve, among other things, ecologically sustainable management of forests on private land. The Act provides for the preparation of regional vegetation management plans which will be gazetted as environmental planning instruments under the Environmental Planning and Assessment Act. It repeals state environmental planning policy No 46 and certain protected lands provisions in the Soil Conservation Act, and it amends the Western Lands Act relating to s18DB licences and the Forestry Act in respect of crown timber lands.

Departmental technical staff have a good understanding of the Environmental Planning and Assessment Act, but there was little documented evidence of how the Act is taken into consideration in relation to forests. The department has no definition for the fifth principle of ecologically sustainable forest management, 'best practice'. It is hoped this will be corrected in the work that is currently underway.

With respect to Principle 1, a very good draft guide for internal use was in preparation concerning the 8-point test. The draft was subject to good document control and well presented. The technical content looked impressive but would require a technical assessment.

Perusal of reports prepared under Section 21D of the Soil Conservation Act did not seem consistent with the content of the Act and were oversimplified. Regional offices are responsible for ensuring compliance with leases and licences and 21D consents, but there was no evidence this occurred, except in response to complaints.

A number of other guides were examined, including an Environmental Review under the Water Act, Guide for Preparing Clearing or Cultivation Applications, a similar one for habitat assessment, Destruction or Injuring Trees on Protected Land, Mitigation of Erosion and Land Degradation for Permanent Clearing on SEPP Protected Land, Erosion Mitigation in Logging Operations in New South Wales, Guidelines for

Addressing Section 90(1) Environment Protection Authority matters for consideration, Guidelines for the Rapid Assessment of Environmental Significance of Leasehold Land and for the Preparation of Interim Regional Vegetation Management Plans, and Definitions and Exemptions for SEPP46.

In the course of assessing Land and Water Conservation procedures for their ability to deliver ecological sustainability of forests, the following more general matters were examined:

- Environmental policy. The department does not have its own environmental policy. It has, however, developed policies under Total Catchment Management including: State Trees Policy, State Soils Policy, State Rivers and Estuaries Policy and State Groundwater Policy.
- Communication. The assessment found that internal and external communication occurred. Departmental newsletter and circulars are used to disseminate information internally, and a communication pack was sighted. However this document was not subject to a process of document control and dealt more with press releases and the content of publications rather than communications. Public participation in decision-making processes is largely covered by legislation.
- Internal Audit. There is a requirement for internal audits but no internal audit management manuals governing the process were sighted; instead, manuals from other departments were used. The current three-year audit plan includes strategic and detailed compliance audits. No clear risk strategy regarding audits was present; however, documentation indicated a risk strategy was used to determine programme audits. The assessment found that audit reports regularly identified a lack of policy and procedures.
- Training. Some training is occurring but is not competency-based, that is, training is not aimed at achieving a particular level of expertise. There is an annual training plan by human resources management at a higher level with local training provided as required. For example, training for regional staff in understanding the 8-point test. Some training records were available but are retained by the trainer and not at a central location

The Department of Land and Water Conservation is a large organisation in transition in terms both of culture, in moving towards a more modern

approach to quality and environmental issues, and structurally, in trying to adjust to a new structure and broader responsibilities. It is also handicapped by having the head office split across two locations. This organisation would benefit greatly from the introduction of an environmental management system, which would provide a focus for the organisation's activities and establish a mechanism to manage environmental issues effectively.

Environmental Protection Authority

The *Protection of the Environment Administration Act 1991* sets out the key objectives for the Environmental Protection Authority as:

To protect, restore and enhance the quality of the environment of New South Wales, having regard to the need to maintain ecologically sustainable development. To reduce the risks to human health and prevent the degradation of the environment.

The term ecologically sustainable development is defined under the Act as:

Requiring the effective integration of economic and environmental considerations in decision making processes.

Under the Act, ecologically sustainable development is to be achieved through the implementation of the following principles and programs:

- The precautionary principle—namely, that if there are threats of serious or irreversible environmental damage, the absence of scientific certainty about the hazard should not be used as a reason for postponing the introduction of measures to prevent environmental degradation.
- The principle of intergenerational equity—namely, that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.
- Conservation of biological diversity and ecological integrity.
- Improved methods for valuing and pricing environmental resources.

The authority's objective of ecologically sustainable development is supported by a corporate plan that outlines a series of programs aimed at developing better tools for environmental protection, managing regional cumulative impacts

on the environment, and reducing the impact of human activities on the environment. These programs are subdivided into four sub-programs. One of these sub-programs, entitled primary production, deals with forest issues. The programs are supported by a series of key tools and strategies with appropriate milestones. The assessment found no indication that budgetary targets were aligned with the programs and strategies.

Policies in support of the strategies or other initiatives generally take the form of position papers and/or public discussion papers. Once comments on such papers are received and reviewed, the papers become the basis for further action. Examples of this include the existing Pollution Control Licences—Justification of Licence Concepts and Conditions dated August 1995, Protection of the Environment Operations Bill 1996, Managing Urban Stormwater dated September 1996, and other more general descriptive documents designed for public information purposes.

These policies and strategies are not always well supported by procedures. A policy/procedures manual does exist but it is a collection of both single-issue type documents and more general policy statements/procedures. It does not systematically provide guidance on the policy implementation process.

With respect to forest issues the authority's major activities relate to the pollution control licence process and approving harvest plans.

- The pollution control licence arose from a request by State Forests to licence their forest harvesting, roading or burning activities. Because of the difficulty of measuring pollution, the Environment Protection Authority took the view that licensing conditions should reflect those environmental protection measures necessary to prevent pollution. To this end, current licences focus on identifying water pollution hazards and implementing strategies by way of a code of practice that puts controls in place to protect against potential pollution. Licence conditions also require State Forests to monitor the water quality outcomes of the 'best practice' management activities. The authority has in the past conducted field assessments to determine the level of compliance and effectiveness of the process.

- Harvesting plans are inspected and approved prior to implementation, using a desk review process.

Some pollution control licences have been audited in the past 18-24 months. However, they were not audited using the audit protocol developed in 1995 due to other ongoing work. To some extent this protocol has been superseded by the Audit Compliance Handbook, produced by the authority in 1997. The assessment team was advised that a comprehensive audit protocol will be developed for the Forestry Unit in the near future.

The assessment found no formal mechanisms for providing feedback to licence holders following an audit; however, the department maintains a 'conditions' file that contains information relating to instances where licence conditions failed to prevent pollution occurring or were not readily understood by licence holders.

The Protection of the Environment Operations Bill will lead to the introduction of a revised licensing system based on performance and risk. This system will include a requirement not to pollute but will also include 'best practice' guidance on measures likely to prevent pollution. Licences will only be required for those areas identified as high risk, for example, in terms of soil type (stability) or land slope.

The definition of best practice within the authority is not clear and thus the basis for environmental protection guidance was hard to confirm. No estimation of the costs involved in adopting these guidelines has been determined. An impact analysis of the draft schedule of the authority's licensed activities has been conducted and indicates that costs associated with this revised legislation would differ little from the current system.

With respect to prosecutions, the authority's guidelines for prosecution have been published and are available to the public.

The authority has descriptions for staff positions and training is identified as part of the performance assessment process.

There was no evidence of an overarching environmental policy that encompasses the authority's approach to the management of its internal and external impacts. Some records of the audits it has performed and of other activities are kept.

SIGNIFICANT ISSUES

The Expert Working Group's assessment of management systems and processes used in New South Wales forests found that there are several factors which significantly impede the implementation of ecologically sustainable forest management.

- Diverse and overlapping legislative requirements;
- Absence of a detailed definition and understanding of ecologically sustainable forest management;
- Lack of a common commitment from stakeholders to the delivery of ecologically sustainable forest management;
- Absence of a framework within which to deliver ecologically sustainable forest management and monitor outcomes; and
- Inability to identify and monitor the financial and other resources required to deliver ecologically sustainable forest management effectively.

Each of these five issues is addressed in more detail in the following section.

Legislative requirements

Legislative requirements for environmental protection within New South Wales are diverse, overlapping and unnecessarily complex. Each of the four departments with responsibility for forest management has its own primary legislative framework; however, they are also subject to legislation of a broader nature that imposes additional legislative responsibilities on them. This legislative structure is not cost effective and requires considerable resources, not only to identify the legislative overlap but also to demonstrate compliance with each requirement.

It may be possible to overcome this legislative problem and a number of alternatives have been identified in Chapter 2.

Definition and understanding of ESFM

Ecologically sustainable forest management is a difficult concept to understand and even more difficult to measure. It is also complicated by its application within an Australian environment and the fact that some time may elapse before the indicators selected as the means of measuring management efforts can be confirmed as

appropriate. The absence of agreed criteria provides an opportunity for those interested parties who wish to avoid implementing ecologically sustainable forest management for political, commercial, financial or other reasons to do so.

With respect to the environment, measuring outcomes alone is not enough. For example, it is possible to produce a 'green' product, such as recycled paper, but to do so using processes that have a significant detrimental effect on the environment. Alternatively, it is possible to produce a product, such as chlorine-bleached paper, using processes that are harmful to the environment, but to do so in a way that is 'best practice' and minimises the impacts of the processes used. The net detrimental effect to the environment is greater from the first example than the second.

It may be appropriate to consider a two-fold approach to achieving ecologically sustainable forest management, examining both process and outcome. Given Australia's long experience in forest management, it may be possible to identify process-related indicators while awaiting the development of outcome-related indicators. These process-related indicators could be based on current 'best practice' activities which provide proven environmental protection. These indicators may take two forms: environmental performance indicators and environmental condition indicators. Within each there would be both management and operational performance indicators.

Environmental performance indicators would be:

- Management performance indicators – provide information about management's efforts to influence the environmental performance of the organisations operations. Such indicators relate to policy, people, practices, procedures, decisions and actions.
- Operational performance indicators – provide information about the environmental performance of the operations of the organisation and relate to:
 - design, operation and maintenance of the organisation's physical facilities and equipment;
 - materials, energy, products, services, wastes and emissions related to the organisation's physical facilities and equipment and ;

- supply of materials, energy and services to the organisation's physical facilities and equipment and the delivery of products, services and wastes from facilities and equipment.

- Environmental condition indicators provide information about the condition of the environment. These are generally the type of indicators expected to be identified and used in the process of ecologically sustainable forest management.

Typical process-related indicators in a forest environment may include:

- Management indicators:
 - number of objectives and targets achieved;
 - degree of implementation of codes of forest practice;
 - degree of compliance with regulations and other requirements (including compliance by contractors);
 - research and development funds applied to ensuring ecologically sustainable forest management;
 - resources applied to support environmental community programs;
 - number of forest areas with environmental performance reports.
- Operational indicators
 - quantity of hazardous material used in forest processes;
 - quantity of energy (fuel, oil, etc.) used per tree logged;
 - amount of non biodegradable waste generated per logged area;
 - average fuel consumption of machinery and equipment per distance run or time used;
 - noise measurement per site;
 - quantity of sediment discharged to nearest water course.

Appropriate process indicators, some of which could be common between agencies and across land tenures, could be developed to suit particular forest operations. Both State Forests of New South Wales and National Parks and Wildlife Service are currently trying to develop such indicators and if this were done jointly across all agencies this may prove a useful mechanism to

start the process of ecologically sustainable forest management and ease the introduction of the more specific environmental condition indicators when these become available.

Commitment to ESFM

To successfully manage New South Wales forests in an ecologically sustainable manner, a strong and consistent commitment will be necessary from each department involved in forest management. This commitment must not only come in the form of financial, human and material resources but also in term of leadership, which will require senior managers to take a personal interest in the process. The responsibility for implementing ecologically sustainable forest management should remain with the most senior executive officer in each department, and the senior management group. Responsibility for day-to-day implementation can be delegated.

Because of the complexity of ecologically sustainable forest management in terms of both what it is and how it is to be achieved, a significant commitment in terms of education will be necessary both within the organisation and externally. Without understanding and acceptance—which translates into ownership within the organisation and externally—it is unlikely that the concept of ecologically sustainable forest management will be accepted. Experience indicates that programs that have to be restarted consume resources in an order of magnitude greater than those starting for the first time, as it is necessary in the former situation to overcome the ‘been there done that’ syndrome.

ESFM Framework

All the organisations evaluated within this assessment process lacked a management system capable of delivering ecologically sustainable forest management. Most organisations had elements of such a system in place and in all cases had pockets of expertise in areas such as policy setting, planning and auditing. Without an effective management system, the delivery of ecologically sustainable forest management in whatever form it takes will be extremely difficult. Furthermore, experience indicates that without such a system the application of ecologically sustainable management practices will be inconsistent across the organisation.

To deliver ecologically sustainable forest management effectively, each organisation will have to introduce an environmental management

system (see Key Recommendation 11). The internationally recognised standard for such systems is specified in the International Standards Organisation’s 14000 series of standards, of which ISO 14004 specifies the components of such a system and ISO 14001 specifies a set of core requirements that may be objectively audited.

As part of an environmental management system, each organisation would have an environmental policy that would contain a commitment to ecologically sustainable forest management. The system would be used to deliver the organisation’s policy and thus ecologically sustainable forest management. The advantages of using such a system over others, including an internally developed system, are its international standing and the fact that it can be independently certified if necessary.

Resource Identification

In order to confirm the implementation of ecologically sustainable forest management within State instrumentalities it will be necessary to identify both the expenditure required for its implementation and maintenance and the funding made available for the purpose (see Key Recommendation 4). The financial management systems currently in use in the organisations evaluated for this report are not able to identify, except in aggregate terms at the highest level, the expenditure associated with achieving ecologically sustainable development. While it may not be possible to identify the resources used at the forest floor, the financial accounting systems in place should have sufficient capability to provide expenditure patterns at regional/area/district/zone levels, as appropriate.

CONCLUSION

Two of the major impediments to implementing ecologically sustainable forest management experienced by the five departments evaluated in this assessment were in the main outside their control. The problems of overlapping legislative jurisdictions and the absence of a detailed definition and understanding of the principles of ecologically sustainable forest management would have to be resolved before the departments could be expected to deliver ecologically sustainable forest management.

The remaining problems associated with ecologically sustainable forest management, namely departmental commitment to the concept,

the absence of a framework within which to deliver it and the ability to monitor resource delivery in terms of ecologically sustainable forest management are matters which each department is able to address. Of these, a commitment from senior management to the concept of ecologically sustainable forest management will be necessary before it can be implemented and significant changes to departmental accounting systems may be necessary before the resources allocated to ecologically sustainable forest management can be measured effectively.

Recommendation 5.1: All New South Wales departments with direct forest management responsibility should develop and implement a recognised (and certifiable) environmental management system. Further details of the requirements for implementation of such a system can be found in Chapter 7 and Appendix A. The environmental management system is essential to ensure continual improvement of forest management ('adaptive' forest management) and to permit effective audits that demonstrate compliance with principles and regulations for ecologically sustainable forest management.

Essential components of adaptive forest management that are currently poorly developed and need to be strengthened include performance measures that can gauge whether management is ecologically sustainable and review processes that will lead to continual improvement in the management system.

The results of applying the environmental management system and the outcomes of management plans should be publicly reported to raise community confidence that ecologically sustainable forest management is being achieved. Regulatory compliance should also be reported and subject to independent validation.

MONITORING

This chapter provides an assessment of the current processes for monitoring the impacts of forest practices on forest values, and recommends improvements to the monitoring process required for ecologically sustainable forest management.

Where management systems and processes capable of delivering ecologically sustainable forest management are in place, compliance with prescriptions, guidelines, codes, and environmental standards will be sufficient to ensure ecologically sustainable forest management.

MONITORING IMPACTS OF ACTIVITIES

Broad Considerations

Monitoring is the single most neglected aspect of environmental management for the delivery of ecologically sustainable forest management in New South Wales. The reasons for this include lack of mandatory legislative provisions for monitoring and reporting under the *Environment Planning and Assessment Act 1974* and *Threatened Species Conservation Act 1995*, lack of long-term funding commitment by government and individual agencies, variation in levels of commitment by individual land management agencies, the lack of understanding and recognition of the problem, and the lack of cross-tenure co-ordination between agencies.

Routine monitoring is one of the most cost-effective research tools for validating and improving impact predictions, codes of practice and operational planning and management procedures. Effective monitoring requires a long-term commitment of resources, standardised monitoring methods and effective statistics and analysis. It is unlikely that the expertise required to develop effective monitoring systems could be replicated within each land management agency.

Public Land – State Forests

Monitoring is generally neglected by forest managers. For example, State Forests of New South Wales have not adopted a rigorous approach to monitoring and measurement, or to the regular recording of non-conformance with legislative requirements or EIS determinations. Very little routine monitoring of change in soil and water values is currently being undertaken in New South Wales forests. The same is generally true of the other states and in most forests world wide.

State Forests of New South Wales have now acted to rectify these deficiencies through two processes:

1. control of management implementation through an 'Annual Management Report' which incorporates the monitoring and review of performance against the major objectives of the plan, and provides certification of performance according to the requirements of the management plan; and
2. an audit programme which has three functions:
 - to evaluate the effectiveness of key planning and operational management systems in ensuring compliance with environmental standards, external approvals, licences and determinations; and to achieve consistent and reliable information on outcomes and the adequacy of internal controls;
 - to determine the level of compliance with environmental standards, and to examine performance in other selected areas; and
 - to recommend cost-effective improvements to systems.

The report at the conclusion of each audit investigation or review will include findings, recommendations, the management response and evaluation of the management response. The report is to be structured to note strategically important risks, and any State-wide issues, as well as reporting on matters specific to the performance of particular activities, programs or business units.

In relation to the silvicultural strategy and provisions of the strategic area management plan, it will be appropriate that monitoring activities focus, in the first instance, on the present forest condition, and the ecological and historical reasons for it. For example, it will be necessary to examine the extent to which natural species and community patterns may have changed with time; the extent to which effective post-harvest regeneration has been obtained; the productive condition of existing growing stock – in terms of the individual tree condition and stand dynamic processes; the range of tree ages/sizes within the forest and its relationship to sustainable yields; the incidence and severity of tree decline and dieback; the extent to which the more critical elements of wildlife habitat have been maintained (or can redevelop); and so on. Post-harvest monitoring within each harvested area should then examine:

- the productive condition of each unit of forest which is more or less homogeneous in respect to species composition and stand structure;
- the extent to which full site occupancy is, or will be achieved – including the adequacy of regeneration (where required) in terms of stocking, species composition, and early growth rates in relation to the intensity of site treatment used to create a seedbed;
- the health and vigour of the forest, including any evidence of tree decline, the vigour of and expression of dominance within the canopy of even-aged stands, and the dynamics of uneven-aged forest as expressed through the potential of trees within different age classes to maintain vigorous growth to maturity;
- the retention of sufficient elements of habitat (trees with hollows, diversity of food-source trees, appropriate understorey) where conservation of fauna (or potential for their rapid recolonisation) was a stated objective of management; and
- the condition of seedlings and saplings which had been planted or seeded to enrich poorly productive sites, and the need (if any) for release treatment.

Auditing is conducted against the Code of Forest Practice and the guidelines of the Pollution Control Licence (PCL) that are designed to protect soil and water values. Under the PCL, a limited amount of water quality monitoring has been initiated, but it is unclear how the findings are being evaluated and used to improve practice. Emphasis must be given to developing key soil and water indicators that can be

used to monitor the effects of forest management in representative forested landscapes. State Forests of New South Wales have some research studies examining change in soil and water values after logging operations. These represent a very limited form of monitoring, but in general there does not exist any explicit method for extrapolating findings from research sites to the broader forest. The issue of how to extrapolate findings also applies to monitoring and this is discussed more fully later.

An explicit basis for stratifying the forest estate for monitoring purposes, and for applying the findings of research or a monitoring program needs to be developed.

Recommendation 6.1: All New South Wales government departments with a direct forest management responsibility should implement long-term monitoring programs so as to be able to track changes in important forest values. Monitoring methods must be able to detect changes at spatial and temporal scales that are significant for ecologically sustainable forest management. A set of key indicators for ecologically sustainable forest management should be selected, used and subject to ongoing improvement. These indicators should be compatible with the regional framework and the core set of indicators developed by the Montreal Process Implementation Group, a national committee working to identify criteria and indicators for reporting ecologically sustainable forest management. Supplementary indicators that cover additional locally important values should also be used.

The setting of targets (for example, sustainable yields, size of animal populations, degree of site disturbance) essential to interpreting effects of forest management on forest values should occur as part of the strategic planning process.

Public Land - Conservation Areas

The introduction of threatened species protection legislation in 1991 increased the responsibility of government agencies, particularly the National Parks and Wildlife Service and the Department of Land and Water Conservation, to regulate the illegal clearing and development of threatened species habitat on private and public land. The performance of government agencies in meeting this responsibility reflects, in large part, their previous history and experience in private land regulation.

The Department of Land and Water Conservation, which has a successful track record for enforcement and prosecution under the *Soil*

Conservation Act 1938, has also succeeded in prosecution and enforcement under State Environmental Planning Policy 46, while at the same time retaining good public relations. The majority of clearing breaches are reported by neighbours. Most landholders comply with the provisions of State Environmental Planning Policy 46 and appear to support the prosecution of the minority who do not comply with the spirit and intent of clearing legislation. In the past, a major problem for the Department of Land and Water Conservation has been the limited (6 months) time frame for discovering breaches (as distinct from 2 years for Protected Lands). This problem has been rectified by the Native Vegetation Conservation Act.

The National Parks and Wildlife Service had no regulatory responsibility for off-reserve habitat clearing and development before the introduction of threatened species and habitat protection legislation in 1991. The Threatened Species Conservation Act provides penalties for harm to threatened species and their habitats and court orders for the restoration of habitat. However, The National Parks and Wildlife Service has made no prosecutions under the Threatened Species Conservation Act and currently lacks a prosecutions policy.

The National Parks and Wildlife Service's role in prosecuting offences against biodiversity is convoluted under existing legislation. The service has no formal regulatory role for habitat clearing and harm offences under part 4 and 5 of the Environment Planning and Assessment Act. The primary responsibility for 8 point tests and habitat clearing on residential land lies with local councils, while responsibility for 8 point tests and habitat clearing on non-residential lands falls under the Department of Land and Water Conservation. The service has a role in regulating activities which do not fall within the provisions of either part 4 or 5 of the Environment Planning and Assessment Act, (for example impacts on protected fauna, firewood and bush-rock harvesting on private land), through the licensing provisions of part 6 of the Threatened Species Conservation Act. However, prosecution is constrained by a requirement in the offence provision, found in section 118D of the National Parks and Wildlife Act to prove that proponents 'knowingly' caused damage to habitat. The effectiveness of enforcement as a disincentive to offences against biodiversity would be enhanced by re-structuring current legislative provisions under a single regulatory agency with

responsibility for 8 point tests, SIS and prosecution.

Most government agencies lack routine monitoring procedures for systematic measurement and reporting on the biodiversity condition of their public estates. A working group is currently considering this issue at the policy level in the National Parks and Wildlife Service. Monitoring should be mandatory for all threatening activities and processes on public and private lands. At the present time there are some procedures for monitoring the effects of forestry, including the loss of tree hollows, but no routine procedures exist for monitoring other threatening processes such as vegetation clearing, frequent burning, and feral animal and weed distribution and abundance.

Recommendation 6.2: A systematic measurement process should be introduced for monitoring the distribution and extent of threatening processes and the condition of biodiversity on all forests after completion of threat abatement plans.

Private Land

Similarly there is no routine monitoring for reporting on the condition of the forest estate on private lands. The government does not know how much illegal clearing goes on in New South Wales each year. The Department of Land and Water Conservation currently relies on the public (particularly neighbours) for monitoring and reporting breaches under State Environmental Planning Policy 46. This approach is inconsistent and unreliable and needs to be replaced by a state-wide systematic monitoring capability. Illegal clearing can cause irreversible loss of biodiversity by removing rare and poorly known populations and communities. It also contributes to the greenhouse problem by depleting carbon sinks and contributing CO₂ to the atmosphere. It has been suggested that Australia could meet greenhouse pollution targets simply by stopping clearing of the land, particularly forests. The expert working group has been advised that the Department of Land and Water Conservation is monitoring clearing as part of the enforcement element of the vegetation reform package.

Recommendation 6.3: A system of vegetation cover monitoring be introduced in areas subject to high risk of illegal clearing.

Proposed Eden RFA

As part of the Eden RFA, an ecologically sustainable forest management manual is being

developed which outlines proposals for assessing key indicators. Sustainability indicators and targets that may be used to assess the delivery of ecologically sustainable forestry management have been listed. Assessment is at two levels: the wider landscape level for the development of the RFA period ('...used during option development to analyse ecological sustainability, implications of a given reserve design and wood supply commitment, and to guide management during the RFA agreement period'); and the more immediate performance level ('...can be implemented immediately after the RFA as a performance measure and used to review performance after 5 years').

A brief outline of the proposals is given as they relate to ecologically sustainable forestry management principles – though it should be appreciated that some of the indicators may be 'regionally specific' and unlikely to be translated directly to regions with different vegetation attributes, management systems and practices.

Biodiversity

Broad assessment of biodiversity conservation would focus on the extent of forest/vegetation type by growth stages (indicators of habitat conservation); the extent of connectivity in relation to threatened species habitat, general retained habitat, and conservation reserves; and management measures to maintain species extent and abundance. The aim is to minimise loss of old-growth and rare or endangered forest types, maintain natural species patterns within harvested forest, and ensure functional connectivity by implementing conservation protocols and by ensuring that ecosystem function is maintained.

Performance monitoring would assess the implementation and efficacy of protocols for all threatened species. The assessment would aim to improve the risk status of endangered species, assess the condition and structure of the forest after harvesting, and monitor habitat abundance and a core set of indicator species over time. The monitoring would incorporate existing data and survey sites, and generate adequate data for the five-year review of the RFA.

Productive capacity

At the regional level, data would be compiled on the annual removal of timber products and non-timber products from forest ecosystems, together with the standing volume of log stocks by species association and diameter class on land available for timber production – by land tenure. This would be

based on progressive inventory and growth modelling, and assessment of the impact of changes in land tenure on apiary and grazing.

The change in harvested volume, standing volume, growth stages and growth rates by forest type would be monitored. It is recognised that it would be appropriated to monitor site quality and changes in site quality, though additional data sets and information would be required before it is possible to report on this indicator (e.g. implications of changes in nutrient budgets).

Health and Vitality

The focus is upon control of exotic species (weeds, feral animals, insects), keeping forest diseases to benign levels (within the limits of natural variability), and reducing the impact of processes which affect ecosystem health and vitality, including fire. Monitoring suggestions include: (i) individual agencies to collect and annually report on biological factors in a constant manner; (ii) the measurement of populations of several target species (pigs, foxes, dogs, rabbits); (iii) the preparation of a complaints register on biological factors received from the community; (iv) the monitoring of the occurrence and impact of wildfire, and (v) the planning and execution of prescribed burning.

Soils and Water

At the broader level, assessment would focus on the extent of roading by road categories, stream-crossing density by catchment for the region, the proportion of individual catchments likely to be harvested during a 20-year period (as a proxy determination of water quality), and changes in the level of growth stages during this period (as a proxy index of change in water quantity).

Monitoring would focus on the stability of crossings as a priority, and the extent and proportion of current harvested forest land with physical disturbance – to ensure that the physical disturbance of subsoil and topsoil does not exceed targets for the sustainable management of soil for each hazard class for each harvest system. The harvesting supervision process would continue to report on occasions of excessive soil disturbance.

Economic and Social

Information would be compiled on the mean volume and royalty-value of logs to be harvested annually by species and grade, and by tenure; and employment numbers by type across all forest users. Targets would include a review of royalty

rates against fair market rates, and a provision that harvest levels would not exceed ecologically sustainable wood supply commitments by more than 5 per cent over the five-year period of the RFA.

The total volume and value of all products (timber, pulp, seed, apiary sites, grazing), and the flow-on economic contribution would be compared with the costs of production for all products; and royalty rates for all product types would be monitored. There is a provision that the harvest of any product type (including water, seed, honey, grazing) should not exceed ecologically sustainable levels by product type over a five-year period. Quantitative statistics on the availability and use of recreational/tourism facilities would be collected, and a gross income index compiled. There would be a target to increase the value of products per unit area as a measure of good forest management.

The expert working group believes that the monitoring process proposed for Eden is an encouraging start but that continuing work is needed to improve indicators, in particular targets, and to provide a clearer basis for interpreting temporal change in them. For Eden, the focus has largely been on environmental condition indicators. These need to be extended to provide a better coverage of management and operational processes. There is also a need to develop monitoring regimes specific to the circumstances of each region or management area. The group offers some further comments on indicators and performance measures based on matters considered in this report.

Provision of Forest Research and Development in New South Wales

The continuing development of monitoring systems depends on a research and development program which can enhance the understanding of how to measure the impacts of forest activities on ecologically sustainable forestry management values, and assess the adequacy of existing protocols and practice. The research and development requirement relating to each of the ecologically sustainable forestry management principles is outlined.

The major providers of forest-related research in New South Wales are State Forests of New South Wales, the National Parks and Wildlife Service, the Department of Land and Water Conservation, and CSIRO and universities.

State Forests of New South Wales' Research Division is currently being restructured following the appointment of a new Director in early 1997. At this stage, a business plan identifying strategic needs, measurable objectives, reviewing process, and funding strategy is not available, but is being developed. The expert working group was provided with a list of current projects categorised according to major objectives. About 50 per cent of the annual research and development budget is committed to work in native forests. Clients (mostly internal) purchase research and development according to a system of annual contracts.

The National Parks and Wildlife Service has an internal research capacity in the Environmental Survey and Research Branch. The service commits 2.2 per cent of its annual budget to support the Branch. A report on the activities of the Branch between 1988 and 1993 was available to the expert working group. The Branch does not have a strategic research plan, and the expert working group was not provided with any documentation describing research planning or management and performance evaluation processes. Again, the expert working group had limited time to examine research and development processes in the National Parks & Wildlife Service.

The Department of Land and Water Conservation can conduct significant research through the Centre for Natural Resources which has 175 staff. Only some of this research is relevant to forests.

CSIRO and various universities conduct some research in New South Wales forests, much of it in collaboration with the managers of the public forest estate.

From its brief review of forest research and development activities in New South Wales, the expert working group concludes that research and development appears to be scattered, poorly coordinated across agencies, and in some agencies (e.g. National Parks and Wildlife Service) very poorly resourced in relation to the need for better forest management. A clear and essential link between agency policy and the research and development needed to help deliver the policy is often lacking. Strategic research planning, and documentation of this, needs to be improved in all agencies.

Recommendation 6.4: Steps should be taken to achieve better coordination and effective use of resources allocated to research for ecologically sustainable forest management in New South Wales government agencies.

Such actions should lead to the formation of a single research unit that services the needs of both forest management and regulation. A single unit would improve research co-ordination and strengthen the focus on meeting the needs of ecologically sustainable forest management, which are often generic across tenures. The unit should undertake formal collaborative work with external research providers to enhance multidisciplinary research. There is merit in linking the proposed forest resource information unit to the activities of the research unit and in co-locating these two units.

Principle 1A Protect and maintain biodiversity

A range of research is in progress relating to reserve management, including basic surveys of species or vegetation, ecological processes, threats to species or ecosystems; management-oriented surveys and limited monitoring of populations and the impact of visitor use.

Reservation alone will not guarantee the long-term survival of some species. Reserves need to be actively managed for specific conservation objectives. The contribution to those conservation values by forests used for wood production also needs to be considered. Where species are threatened by contemporary human disturbance, their habitat requirements should be identified so that these can be protected or re-created as required. Information of this sort is limited for forest-dependent flora and fauna in Australia. Continuing research is needed to provide the data on which species management plans can be based and to assess the adequacy of the systems used in establishing reserves for representing biodiversity.

The National Parks and Wildlife Service research program on biodiversity gives the impression of being disjointed (rather than strategic) and poorly resourced.

For State Forests, research into biodiversity has been more strategic and better resourced. Better documentation of the process by which research priorities are set would, however, be desirable. Further strategic research is needed, especially into fauna, including detailed systematic surveys to improve confidence in predicting the occurrence of threatened species, and studies to improve the integration of reserve and off-reserve management to meet conservation objectives better.

Recommendation 6.5: Strategic plans for flora and fauna conservation research should be developed. This should be undertaken by the

proposed Forests Research Unit in collaboration with the forest land managers. Research into reserve selection and management for protecting and maintaining biodiversity on private land as a priority.

There is a critical need throughout Australia for the development of models to predict future forest conditions under a variety of management regimes, in terms of biodiversity, structure and productivity. Such models are essential tools for the long-term management of all forest tenures and uses. An improved knowledge of the effect of fire and successional processes in relation to biodiversity is vital to this work.

Recommendation 6.6: Predictive models of successional processes for major forest types should be developed. These should be done by the proposed Forest Research Unit.

Research is required into the effects of various forms of plantation management on biodiversity conservation, both in the plantations and in adjacent natural ecosystems. The latter is especially important in terms of pest and disease management, fire control and gene linkage issues.

Principle 1B Maintain the productive capacity and sustainability of forest ecosystems

The review and improvement of the capacity to maintain the productive capacity and sustainability of forest ecosystems rely on a combination of formal research and a more general approach to adaptive management based on the monitoring of performance in the field.

In State Forests of New South Wales, research is conducted on improving inventory and growth modelling. The Resources Branch has developed methods for forecasting future growth and yield. All these activities are being integrated under the FRAMES project which will continue for several years. The capacity to forecast future growth and yield is recognised as central to ecologically sustainable forestry management, and the current limited capacity to achieve this, especially in regrowth forests, is acknowledged.

The current limited capacity to predict future forest growth, yield and wood quality in regrowth forests, is a major impediment to the achievement of ecologically sustainable forest management and must be rectified. This is a priority area for research and development, especially for the mixed-age and mixed-species forests of the northern parts of New South Wales.

Recommendation 6.7: High priority should be given to research and development to improve spatial prediction of future forest growth, yield and quality in regrowth forests, and to incorporate the effects of a wide range of contrasting silvicultural systems on these predictions.

The documentation of the scientific basis for currently used silvicultural systems and their key elements needs to be better developed and focused on public education. More areas for demonstrating alternative silvicultural systems need to be established.

Demonstration areas should include some of the alternative systems advocated by sections of the community. Carefully targeted research trials should be established to resolve elements of the systems that are in contention, ensuring that they are designed for long-term observation and capable of contributing data to the development of silvicultural models. Because of the high cost of research of this nature, and the degree of public interest, multi-disciplinary design and public input are desirable. The trials should be modest in their breadth and complement, rather than attempt to duplicate relevant research in other States.

Recommendation 6.8: The agency responsible for wood production should document the scientific basis for current silvicultural practices, establish demonstration areas for a range of systems and initiate specific multi-disciplinary research trials aimed at resolving contentious aspects of these systems.

Principle 1C Maintain forest ecosystem health and vitality

Some routine assessments of forest health are conducted in native forest and plantations, focusing mainly on disease outbreaks. A limited amount of research and development is attempting to develop indicators of health and vitality.

Fire, both natural and managed, can threaten many forest values, but its impacts are still poorly understood. Fire management planning focuses mainly on protection goals and consideration of other values is often limited. In view of the importance of fire in the maintenance of particular species and ecosystems, and its widespread use for hazard reduction, considerably more research is needed in this area. The limiting factor at present appears to be resource allocation.

Recommendation 6.9: The proposed Forest Research Unit should prepare in collaboration

with the forest management units a strategic program of fire management research that covers all forest tenures.

Principle 1D Protect soil and water resources

Several agencies are conducting research on soils, hydrology, and tree nutrition. Some long-term research and monitoring of nutrient flows and water yield and quality is also under way.

There is a scientific basis for guidelines to protect soil and water values listed in the State Forests of New South Wales Forest Practices Code and the Pollution Control Licence.

The effectiveness of buffer and filter strips in protecting water quality and aquatic systems, especially of temporary streams, merits continuing research (see Chapter 3).

There is a need to develop improved indicators to permit the monitoring of changes in soil fertility.

Principle 1E Maintain the forests' contribution to global carbon cycles

As far as the expert working group is aware, little work has been done on the contribution of the New South Wales forests to carbon cycles. The reasons for this are given in Chapter 3.

The contribution of forests to carbon budgets in New South Wales, as well as nationally, needs to be assessed. A nationally coordinated program based on regional analyses is needed.

Principle 1F Maintain and enhance long-term socio-economic benefits

Assessments of the contribution of New South Wales forests to social and economic values have been made in recent years by State Forests of New South Wales and as part of the RFA process. However, systematic research in this area appears to be lacking.

The next major decision on land-use allocation and management will be made during the development of the Regional Forest Agreements. There are several options for developing mechanisms for a periodic review of RFAs. Consideration of the trade-offs necessary in the development of future strategic plans may be conducted through a range of public participation processes. As discussed in Chapter 3, there is a need to strengthen and formalise these processes in New South Wales. The expert working group considers there are advantages in maintaining

some flexibility in the mechanisms to suit the circumstances of the time rather than institutionalising them at this stage.

REVIEW AND IMPROVEMENT

This chapter makes recommendations for improving scientific underpinning, management systems and associated processes in order to increase the certainty of achieving ecologically sustainable forest management.

Review and improvement of forest management requires both a strengthening of the scientific basis for prescriptions and practices and a system for ensuring the effective implementation of management policy. These requirements are also necessary to ensure that internal processes and outcomes meet the needs of management and stakeholders. These needs may include those associated with internal requirements, such as the cost effective delivery of services, and external needs such as the maintenance and protection of conservation values.

Processes that lead to review and improvement of forest management are important for two reasons:

- it is likely that management prescriptions will need to change because knowledge of the long-term effects of forest management on ecological values is currently limited and uncertain, and
- the community's expectations of what constitutes ecologically sustainable forest management will change over time.

Forest management strategies must respond to changing circumstances, including better knowledge of the effects of those strategies. Forest management presents unusual challenges because forests take a long time to reach mature form. This means that the structure of forest plant and animal communities is complex and changes with forest age, and changes in ecosystem structure and function are difficult to detect as they occur over such a comparatively long time.

ENVIRONMENTAL MANAGEMENT SYSTEMS

The most significant procedural improvement recommended in this report is to implement an environmental management system that will provide a consistent and recognised framework for the delivery of ecologically sustainable forest management. Such a system delivers many benefits. It:

- Provides a more structured approach to managing and delivering the department's environmental policy;
- Provides a recognised mechanism through which the department can report on its environmental performance and identify the resources necessary to deliver the required performance level;
- Allows the department to demonstrate due diligence;
- Allows greater operational control over the department's activities;
- Increases departmental effectiveness by providing a better database for forward planning;
- Can be used to identify the cost benefits associated with environmental improvement;
- Provides stakeholders with a demonstration of the department's commitment to environmental issues;
- Has the potential to improve departmental community relationships through a common understanding of systems and processes.

The environmental management systems currently being used by State Forests of New South Wales and National Parks and Wildlife Service have been evaluated against the criteria of the

internationally recognised *ISO 14001 Environmental Management Systems: Specification with guidance for use*. The results of the evaluation are detailed in Appendix A. The appendix also provides guidance on the actions required by departmental staff to meet the requirements specified in this standard.

RESEARCH AND DEVELOPMENT

The effectiveness of research and development programs in contributing to ecologically sustainable forest management depends on the processes that determine the priorities for the programs, successfully execute research, and improve planning and management by capturing the findings. The following processes are important:

- Identification of the key research needs in relation to ecologically sustainable forest management.
- Risk assessment to assess the consequences of not undertaking particular components of research.
- Prioritising research needs in relation to one another and securing resourcing.
- Setting targets for individual research projects in relation to what is needed to minimise the risk from lack of knowledge.
- Setting secondary processes in place to ensure adequate performance of the research programmes.
- Assessment of information deficiencies during the development of strategic land-use plans.
- Evaluation of the risks of adverse effects during the strategic land-use planning process.
- Ensuring plans and prescriptions are underpinned by scientific knowledge.

RESEARCH MANAGEMENT

The purchaser (client)–provider model is currently being applied to research conducted by State Forests of New South Wales. While this model ensures a close interaction between the client and the research provider, with clear financial commitment on the part of the client, it can be a deterrent to longer-term strategic research. Currently in New South Wales, the processes by which research priorities are developed are not well documented. Better documentation would

help in later evaluation of results and in the revision of priorities.

The development of a strategic plan for research and development would address all of these components. The process for allocating funding to research is important and should be based on an analysis of the threats to ecologically sustainable forest management and the contribution of research to reducing these threats, rather than on any arbitrary proportion of organisational budgets.

FOREST PRACTICES CODES

As discussed in Chapters 2 and 3, there is a need to further develop codes of practice to assist with the implementation of ecologically sustainable forest management. It is vital to incorporate state-of-the-art information in the codes, and to set up effective review and update mechanisms. Such mechanisms are extremely important for continual improvement of forest management. An effective code system involves a combination of self-regulation, well-founded prescriptions that can be updated in the light of new knowledge, adequate sanctions, and use of well-trained staff. Such a system is a useful vehicle for ensuring that appropriate standards are implemented and, over time, for improving the general standard of forest management. One way of improving the code system would be to require an independent review of the operation of the system and its outcomes at regular intervals, not greater than five years.

Recommendation 7.1: An independent expert review of the operation of the forest practices code system and its outcomes be undertaken at intervals not greater than five years.

ADAPTIVE FOREST MANAGEMENT

The most important contribution research can make to ecologically sustainable forest management is to improve the quality of the planning, management prescriptions (especially their ‘local’ application), monitoring methodologies, and environmental standards that are used for interpreting the effects of management on forest ecosystems.

There are two approaches to collecting information that can be used to improve management prescriptions.

The first is based on site-specific research (case studies) that examines the effects of various forest management options in a number of representative forest environments. The results are then

extrapolated to the wider forest estate using some form of environmental stratification (e.g. forest type, soil type, terrain features, etc.).

The second approach is based on systematically monitoring the outcomes (effects) of forest management. An example of this approach is the monitoring of regeneration success, which uses a standard methodology, specific standards, reporting, and strategies for remedial action where required.

The former approach is the one currently used most frequently in New South Wales forests. This approach suffers from a major limitation, namely that generally results are extrapolated from a few experimental sites to broad areas having vastly different environmental conditions. Often there is no explicit basis for how results are applied to the forest at large. It is clearly desirable to supplement site-specific research with monitoring of outcomes.

Recommendation 7.2 : A clear strategy to develop and implement effective monitoring of forest management outcomes, leading to review of management practice (adaptive management) should be defined in regional forest agreements.

STRENGTHENING SCIENTIFIC INPUT

Much forest management practice involves the development of detailed decision criteria and prescriptions based on advanced scientific and technical knowledge. While forest management agencies in New South Wales maintain several significant research groups these do not cover all areas of relevance to improving forest management. Strong mechanisms are needed to ensure that external advice is routinely sought to fill gaps.

External peer review is a mechanism for increasing the transparency of management actions and is also a key component of any risk minimisation strategy. The forest management agency should ensure that the scientific basis of those parts of the management system that generate greatest risk to ecologically sustainable forest management is subject to peer review. Peer review is also important in areas of management where there are contrary scientific interpretations or scientific knowledge is advancing rapidly. Management prescriptions should be made available to the public in a timely manner.

Some community groups commonly complain about lack of timely availability of scientific information. A strong commitment to timely completion, appropriate peer review and publication of scientific research is essential to underpin both ecologically sustainable forest management and public confidence in forest management processes.

CONTINUAL IMPROVEMENT

Continual improvement of the management system and its outcomes in New South Wales will be based on identifying the key elements for review and improvement. These key elements may be summarised as follows:

- Clear identification of performance indicators for both management and environmental outcomes;
- Timely reporting of performance indicators both internally and externally;
- Active assessment of feedback from staff and the public concerning current management and environmental performance;
- High level performance review using both internal and external technical expertise;
- Development of changes in major management processes to correct identified weaknesses;
- Ensuring that major advances in scientific knowledge are reflected in management prescriptions;
- Ensuring that important research and development is initiated to address major problems identified during review;
- Ensuring that the above processes are maintained over time.

APPENDICES

APPENDIX A

COMPARISON OF THE CURRENT NSW ECOLOGICALLY SUSTAINABLE FOREST MANAGEMENT SYSTEMS AND PROCESS WITH AS/NZS ISO 14001 WITH GUIDANCE FOR IMPLEMENTATION

General

This section of the report compares the current New South Wales ecologically sustainable forest management systems and process for National Parks and Wildlife Service and State Forests with AS/NZS ISO 14001 Environmental Management Systems – Specification with guidance for use, and provides guidance on the actions required by departmental staff to meet the requirements specified in this standard. Detailed definitions related to the terms used and references quoted in the text are contained in Annex A.

1.0 Environmental management system (Clause 4.0)

1.1 General requirements (Clause 4.1)

What the standard says

The standard specifies the core requirements for an environmental management system. It applies to those environmental aspects which the organisation can control and on which it can be expected to have an influence. The system will enable the organisation to establish and assess the effectiveness of procedures to set the organisation's environmental policy and objectives, achieve conformance with them and demonstrate conformance to others. To achieve this it is necessary to:

- Put the system in writing and include:
 - procedures
 - work instructions.
- Ensure the system is working properly.

State Forests: current position

A review of State Forests of New South Wales' current management system for the implementation of its environmental policies and strategies shows that the system had a strong policy focus in the 1980s. This is demonstrated by the various forest policy statements issued during this period and the issue of the then Forest Commission booklet entitled Planning for the Future which clearly outlined the policy/planning process. Since the late '80s this policy/planning focus appears to have moved to a lower level with less emphasis on centralised policy and planning and a move to more regional autonomy. This in turn has encouraged the development of regional systems with a greater concentration on workplace activities, frequently at the expense of policy and planning.

While this move may have been aimed at increasing the effectiveness of the forest management process at a regional level, it has done so at the expense of consistency, harmonisation and process improvement in the way in which regional activities are performed. For example, variations are evident in the way in which tasks such as harvest planning, forest operations and other functions are performed between regions, regardless of the differences inherent in managing different forest types. Attempts to achieve consistency are proceeding in some areas through processes such as the total quality management initiative on harvest planning improvement. However, even these initiatives lack a strategy which prioritises the issues on the basis of environmental impact, cost effectiveness, process time etc., and thus allows staff to see the

relevance to their work activities and the organisation's mission.

The development of a systems approach to management activities can be resource-intensive in the initial phases and it is evident from discussions with staff and from visual observations that State Forests is down-sizing. This leads to conflict between operational priorities (i.e. getting the day-to-day job done) and those system establishment and implementation priorities necessary to provide a consistent outcome from the various work-processes themselves. Staff losses and work loads are increasing within State Forests and these conditions are not conducive to the development of sound management systems nor to the delivery of consistent and effective outcomes. Senior management will need to assess carefully the resources available for implementing their chosen management system if the implementation process is to proceed smoothly and be successfully concluded within an acceptable time.

National Parks and Wildlife Service: current position

National Parks and Wildlife Service, like its State Forests counterpart, had strong policy focus in the very late 1980s and early 1990s. This can be seen in the number of policy manuals that were dated 1993. These were in general of a very high standard but appear to have languished between 1993 and 1996 with additional manuals only appearing as a result of new legislation. Draft new manuals are now evident for a range of issues such as threatened species management, threatened forest fauna and biodiversity.

This has again provided the opportunity for inconsistency across regions in matters such as risk assessment and has allowed the development of regionally based manuals such as the pollution manual. While these initiatives are to be encouraged, they increase the opportunity for regional activities to get out of step with corporate objectives and cause misinterpretation of policies and principles.

The Service went through downsizing during the early '80s, followed by an increase in staff in the late '80s when it became apparent that the organisation was understaffed; and this is evident in the level of staff competence currently available in the organisation. It is clear that a mainstay of the current organisation is the knowledge of senior staff, especially at the

regional level. Unless the current policy framework and associated procedures are revised and improved, the Service will have to do a lot of learning when the existing staff retire.

Recommendation A1: Senior management of State Forests and National Parks and Wildlife Service should:

- **commit to the development of environmental management system at the earliest opportunity**
- **prepare an implementation plan for the selected system**
- **identify, document and commit the level of human and material resources necessary to implement its environmental policy.**

Additional guidance

AS/NZS ISO 14004 clause 4.1 and Annex A.1 offer additional guidance on an EMS.

1.2 Environmental policy (Clause 4.2)

What the standard says

The standard wants the organisation to:

1. set and document an appropriate environmental policy having regard to the environmental impact of the organisation's activities, products and services;
2. make sure all the organisation's employees understand what this means to them in their day to day work activities;
3. make the environmental policy available to the public;
4. abide by its commitment to the environment in all that it does both now and for the life of the statement;
5. continually improve its environmental performance and prevent pollution; and
6. set and assess environmental objectives which quantify its commitment to comply with relevant environmental legislation and regulations and with any other requirements to which the organisation subscribes.

State Forests: current position

An effective environmental policy is traceable in the organisation's mission, vision and values and, specifically with respect to government

instrumentalities, in any overarching Government environmental policies. New South Wales government policy with respect to ecologically sustainable forest management is derived from its subscription to the *National Forest Policy Statement 1992*, which was developed in response to the reports of the Ecologically Sustainable Development Working Group on Forest Use, the National Plantations Advisory Committee and the Resource Assessment Commission's Forest and Timber Inquiry. State Forests showed its commitment initially in their corporate plan, which refers to sustainability in environmental and commercial terms, and at a policy level in its environmental policy.

State Forests' corporate and environmental policy, as currently written, does not fully reflect the requirements of ecologically sustainable forest management as documented in either the National Forest Policy or in the ecologically sustainable forest management principles. For example, they do not reference the National Forest Policy or list all the principles, such as integrated decision-making and management or forest conservation, although these may be inferred from an examination of these and other policies and their likely collective outcome. The environmental policy as currently written would not meet the requirements of ISO 14001 in that it does not provide a framework for, or reference, the setting of environmental objectives and targets.

National Parks and Wildlife Service: current position

The Service has well-defined mission, vision and values statements which designate key program areas and priority corporate issues with respect to the requirements of the Environmental Planning and Assessment, Heritage and Wilderness Acts. However, the organisation has no current internal environmental policy for its own operations and thus it is not possible to trace the key tenets of ecologically sustainable development as reflected in the National Forest Policy through to their application and implementation in the organisation. No single document was evident which encapsulated the Service's perception of ecologically sustainable forest management and its implementation process.

The corporate plan is well supported by policy statements about law enforcement, concessions and leases, wilderness, threatened species, vertebrate pest control and other conservation

protocols. Perusal of a number of the available policy documents revealed an initial bias towards human resource issues which now appears to have been corrected by a swing towards more environmental policy issues. However the majority of these policy documents do not appear to have been subject to any major review since their initial issue and could in some cases be out of date.

Although the technical content and overall quality of the available policy documents was very good, there was some suggestion that they were not being followed in all areas of the organisation. For example, the fact that a number of these policies had not been revised since their inception could mean that their use is infrequent so that nobody thought to revise them, not all staff were aware of their existence or breadth, and their distribution was not well controlled.

Recommendation A2: State Forests should:

- **establish and document a clear link between relevant national and State government environmental/forest policy and the organisation's corporate objectives;**
- **commit itself to the development of those general and specific policies necessary and relevant to implement national and State government environmental/forest policy and the organisation's corporate objectives;**
- **develop strategies for the implementation of their corporate environmental policy and other more specific environmental policies;**
- **ensure that the development and implementation processes are transparent and involve workplace staff; and**
- **revise the environmental policy to better reflect the requirements of ISO 14001.**

National Parks and Wildlife Service should:

- **develop, promulgate and implement an organisation-wide environmental policy which contains the core elements of its approach to the management of its environmental responsibilities as both a regulator and forest manager;**
- **encapsulate in its environmental policy statement, or other document as appropriate, the organisation's perception of ecologically sustainable forest management in the context of its regulatory and managerial role;**

- **review its existing environmental policies for currency and develop new environmental policies to better reflect its commitment to ecologically sustainable forest management; and**
- **ensure the policy meets the requirements of ISO 14001.**

Additional guidance

AS/NZS ISO 14004 Clause 4.1.4, AS/NZS ISO 14001 Clauses 4.2, Annex A.2 and BS7750 offer additional guidance.

1.3 Planning (Clause 4.3)

1.3.1 Environmental aspects (Clause 4.3.1)

What the standard says

The standard wants the organisation to:

1. establish and maintain a procedure to specify its environmental aspects, that is those of the organisation's activities, products and services which interact with the environment and over which it can exercise control or be expected to influence;
2. identify those environmental aspects, including those occurring during normal, abnormal and potential emergency conditions, which have a significant impact on the environment;
3. based on these significant impacts determine those environmental aspects that are significant; and
4. keep this information up to date.

This element of the standard is trying to ensure that the organisation has a process to remain fully aware of the significant environmental aspects of its activities, products and services. This process should, where appropriate, consider for operating units such factors as:

- emissions to atmosphere
- releases to water
- waste management
- contamination of land
- use of raw materials and natural resources, such as land, water, fuels and energy
- other local environmental issues, including noise, odour, dust, vibration, and effects on

specific parts of the local environment and ecosystems etc.

State Forests: current position

The current management and control of environmental impacts in the forest industry is largely based on the practical experience gained since forest activities first began. This has resulted in a planning process which is primarily aimed at impact prevention through the conduct of sound environmental practices before and during the conduct of on-site activities and the amelioration, where necessary, of those impacts that cannot be avoided.

Perusal of these plans in the context of an Environmental Management System reveals a plethora of relevant information, none of which, except within the environmental impact assessment process, is centred on an understanding of the environmental impacts caused by particular activities. For example, it is not possible within the current planning process to follow a particular activity (on-site machinery operation) in a consistent manner through the interaction it has with the environment in terms of releases to air, discharges to water, resource use etc., to determine any site-specific characteristics (such as topographical, geographical, hydrogeological, habitat or other considerations relevant to the activity), to assess their significance, and to determine the impact and aspect it creates. In addition, the environmental impact statement was not required to consider activities over which State Forests has influence, such as the type of equipment used by the contractor to bring employees to and from the work-site, as against that which it controls such as actual work-site activities; nor was it required to consider abnormal or emergency circumstances in terms of work activities.

That is not to say that these things have not been recognised, but merely to show that their identification is spread across a number of documents and is not necessarily complete in all cases. For example, the impacts of material resource use in terms of machinery fuel is not normally considered relevant in all logging operations. The down-side to this approach, from the viewpoint of an environmental management system, is that it has until the advent of the environmental impact statement been reactive: only after impacts have occurred has action been

taken to ameliorate the situation and prevent a recurrence.

In terms of an environmental management system, it is likely that most of the information necessary to demonstrate the link between an activity and its subsequent impact is available from the current documentation held by State Forests. However, it would need to be reformatted into a form that can be used in an environmental management system framework and may require further work to list impacts in priority so as to allow the setting of objectives and targets for improving the organisation's environmental performance.

National Parks and Wildlife Service: current position

Again, as with their State Forests counterparts, there is not always a clear link between all the activities performed in managing a national park and the impacts these create. That is not to say that this link is not present but merely to point out that it is difficult to work through a process of the kind required in an environmental management statement where each activity (for example, on-site machinery operation) can be linked to its environmental aspect (releases to air, discharges to water etc.), any site-specific characteristics (close to a koala habitat) can be noted, and the impacts the activity creates (for example, noise, emissions of carbon monoxide and its impact on the koala habitat) and its significant aspect can be recognised.

All activities (a wide-ranging definition is present in the best practice guidelines for Part 5 of the *Environmental Planning and Assessment Act 1979* produced by the (then) Department of Planning), proposed in areas dedicated or reserved under the National Parks and Wildlife Act Section must be accompanied by a review of environmental factors, or in some cases an environmental impact statement as required under this Act. This process is extensive and includes activities performed by an external body or by the Service itself. An outline of a procedure for this is documented in the draft Environmental Planning and Assessment Manual dated 1993. Where this has been done, it would meet the requirements specified under an environmental management statement. However, the Act does not say what should be done with respect to changed circumstances nor does it provide guidance on the discretionary component given to a district officer to decide whether any activity is significant.

Recommendation A3: State Forests and National Parks and Wildlife Service should:

- **identify the activities, products and services performed during the total forest process including compartment identification, planning, contractor selection, harvesting, reforestation etc., which management may control or influence;**
- **develop (and keep up to date) a procedure to list those significant environmental aspects, including those resulting from normal, abnormal and potential emergency situations, arising from its own activities, products and services and/or those supplied by contractors;**
- **ensure that any changes in their activities, products or services are reviewed for their effect on the organisations' impacts created by forest operations;**
- **assess the contractual arrangements with their contractors with a view to ensuring that they identify their impacts and, as a minimum, manage those impacts effectively and advise district forest management before undertaking a new activity or changing an existing activity that may lead to a change in their environmental impact;**
- **review all management plans to ensure that they contain or reference responsibilities, measuring/monitoring and implementation timescales where appropriate; and**
- **develop and document a risk management policy and an associated implementation strategy necessary for the implementation of an environmental management system.**

Comment

The identification of the activities, products and services, and their potential or actual interaction with the environment that occurs at every function and level within the organisation, is essential if an environmental impact is not to be missed. This identification is best accomplished by the employees themselves as they are in the most appropriate position to notify management of any new or changed activities, products, services or environmental interactions, before, or as, they occur and thus allow the impacts of these new or changed circumstance to be considered before they happen.

Although the level of influence of State Forests and National Parks and Wildlife Service over their contractors may be limited, it should extend to requiring them to consider as part of their contract conditions the development and approval of an environmental management plan to manage their on-site activities, incorporating energy saving and recycling where appropriate. This may also be an effective way to manage contractor activities.

Additional guidance

AS/NZS ISO 14004 Clause 4.2.1, AS/NZS ISO 14001 Clause 4.3.1, Annex A.3.1, AS4360 and 3931 offer additional guidance on this element of the standard.

1.3.2 Legal and other requirements (Clause 4.3.2)

What the standard says

The standard wants the organisation to:

1. identify all environmental, legislative and regulatory requirements, codes of practice or other standards to which the organisation subscribes directly applicable to the environmental aspects of its activities, products and services associated with the organisation's business; and
2. set up and maintain procedures to ensure any new or changed requirements are identified.

State Forests: current position

State Forests have a management role over the assets which they manage and are well aware of the relevant legislative, statutory or other requirements applying to their activities, products and services. They have qualified legal staff whose role is to assess legislative changes for their impact on the organisation's activities. However, there was no evidence that procedures existed to ensure the ongoing dissemination of such requirements to those responsible for their implementation or that this process was being monitored effectively and that the information received was required to be acted upon.

National Parks and Wildlife Service: current position

The Service has a management role over its own assets and a regulatory role over the assets of others. Legal responsibilities and roles regarding

enforcement are outlined in a Law Enforcement Manual dated 1989. Other legal responsibilities are detailed in the various policy documents held by the organisation. For example, the Environmental Assessment and Planning Manual outlines both the regulatory and managerial role. The organisation has qualified legal staff whose role is to assess legislative changes for their impact on the organisation's activities. No procedures were seen which showed that legislative changes were disseminated (except as part of policy changes) through the policy units such as threatened species, wilderness or conservation, or that the process was being monitored effectively.

Recommendation A4: State Forests and National Parks and Wildlife Service should develop and implement procedures for the identification and ongoing assessment of legal and other requirements which relate to the organisations' activities.

Comments

Although the standard does not require the maintenance of a register or other database of all the relevant legal and/or other environmental requirements previously identified, this is recommended.

Additional guidance

AS/NZS ISO 14004 Clause 4.2.3, AS/NZS ISO 14001 Clause 4.3.2 and Annex A.3.1 offer additional guidance on this element of the standard.

1.3.3 Objectives and targets (Clause 4.3.3)

What the standard says

The standard wants the organisation to consider its legal and other obligations, its significant environmental aspects, technological options, operational and business requirements and the views of interested parties in:

1. identifying and documenting its objectives and targets for the relevant levels and functions within the organisation;
2. ensuring that the objectives and targets are consistent with the organisation's environmental policy and its commitment to the prevention of pollution.

State Forests: current position

State Forests' current environmental policy commits the organisation to meeting the environmental requirements set by legislation and regulation and to communicate and consult effectively and constructively with the community regulators and customers and to develop partnerships for cooperative forest management at the strategic level. The current environmental policy does not require the setting of objectives and targets aimed at improving the organisation's environmental performance (by reducing the impacts created) although some objectives and targets achieve this. For example, the Eden environmental impact statement identifies as an objective 'exclusion of the Long footed Potoroo moratorium area from logging for three years while research proceeds'.

The objectives set within the planning process are generally based on management of environmental performance with commensurate targets, some of which lack the necessary precision to be auditable. For example the Eden environmental impact statement has as an objective to 'obtain hydrological data for regional rivers monitored by Department of Water Resources - periodically'. Without a clear definition of the period (days, weeks, years?) this target is meaningless. However, it should be noted that while the target may be meaningless in practice it should not be concluded that the monitoring is not being done at precise and regular intervals.

In setting its objectives and targets, State Forests will no doubt give due consideration to its operational and business requirements and may need to determine its Best Practice Environmental Option (BPEO). BPEO in this context means the option which, for a given objective, provides the most benefit or least damage to the environment as a whole, at acceptable cost, in the long term as well as the short term, as a result of a release to the environment. BPEO decisions on the setting of objectives and targets should be documented.

State Forests' environmental policy and the requirements of the environmental management system seem to coincide as far as obtaining the views of interested parties is concerned. The public comment period of the environmental impact assessment process, the role of the Regulatory and Public Information Committee (RaPIC) and the harvesting advisory boards clearly offer opportunities for interested parties (stakeholders) to comment upon the objectives set

in documents generated during planning and harvesting processes.

National Parks and Wildlife Service: current position

The corporate plan contains high level objectives and targets. However the setting of environmental performance-based objectives and targets at a lower level could not be confirmed. Several management plans were examined and found to contain objectives, but these were a mix of management-related and performance-related objectives. None of the management plans examined contained both environmental objectives and targets.

The Service has noted this deficiency and has engaged a consultant to assist in the setting of performance objectives and targets. This is a commendable approach, but care must be taken to ensure that the performance indicators established relate to the organisation's overall objectives in terms of ecologically sustainable forest management. These environmental objectives should also be set in conjunction with the organisation's interested parties such as employees, other government departments and agencies, local councils, relevant community groups, etc. In addition, it is essential that the organisation establish a management system to deliver the agreed objectives and targets. Without such a system, the objectives and targets will not in themselves be sustainable.

Recommendation A5: State Forests and National Parks and Wildlife Service should:

- **set objectives and targets that can be directly related to the organisation's environmental performance and specifically related to the significant aspects occurring at particular locations; and**
- **develop policy and procedures to formally seek community consultation in the setting of objectives and targets.**

Additional guidance

AS/NZS ISO 14004 Clause 4.2.5, AS/NZS ISO 14001 Clause 4.3.3 and Annex A.3.3 offer additional guidance on this element of the standard.

1.3.4 Environmental management program (Clause 4.3.4)

What the standard says

The standard wants the organisation to:

1. set up and maintain a program for achieving environmental objectives and targets;
2. assign responsibility for achieving targets at each function and level within the organisation;
3. document how objectives and targets will be achieved; and
4. amend the program to manage the environmental issues associated with projects related to new or modified activities, products or services to show:
 - what environmental objectives are to be achieved
 - how they will be achieved.

State Forests: current position

Under the requirements of AS/NZS ISO 14001, an environmental management program (EMP) forms part of an environmental management system and is necessary to show how the environmental objectives and targets for particular activities, services or products are to be met. In State Forests, environmental objectives and targets are generally defined in terms of protection control measures the intent of which may appear in conservation plans, codes of practice, harvesting plans, pollution control licence conditions or other documents used by staff responsible for particular activities occurring in the forest.

This practice however does not provide a clear and demonstrable link between what is set out in the environmental impact statement and what is accomplished on site. The requirements of the environmental impact statement in terms of objectives and targets are diffused over such a wide spread of documents that it is not possible to determine whether all the requirements have been met or that adequate resources have been provided to enable the objectives and targets that have been set to be met. To be effective it is necessary for these documents to include details of both the responsibility for implementing the objectives and targets and the resources to be allocated for their completion within the times allotted.

The absence of an effective environmental management program, which may be a stand alone plan or be made up of several plans, does

not allow the organisation's commitment to improving its environmental performance to be demonstrated. Nor does it provide management with any feedback in terms of material or other resource requirements necessary to meet its environmental policy. The environmental management program should be integrated with the organisation's corporate or strategic planning processes to ensure that resource requirements are known during the financial planning process and that it is aligned to the organisation's other programs and its stated mission. Such links were not clearly evident in State Forests' current operations.

National Parks and Wildlife Service: current position

The Service management plans contain objectives which show that the resources to achieve these objectives should come from current programs. In addition, a Financial Impact Statement is required to accompany each plan of management.

Recommendation A6: State Forests and National Parks and Wildlife Service should:

- **develop environmental management programs based on the objectives and targets set as a result of the determination of the organisations' significant aspects; and**
- **develop and implement procedures requiring the consideration of objectives and targets during the strategic planning and budgetary processes.**

Additional guidance

AS/NZS ISO 14004 Clause 4.2.6, AS/NZS ISO 14001 Clause 4.3.4 and Annex A.3.4 and BS 7750 Clause 4.6 and Annex A.6 offer additional guidance on this topic.

1.4 Implementation and operation (Clause 4.4)

1.4.1 Structure and responsibility (Clause 4.4.1)

What the standard says

The standard wants the organisation to:

1. document the environmental responsibilities of each person within the organisation whose activities may have an environmental impact;

2. show who they report to and who reports to them;
3. state what they are responsible for and communicate this to them;
4. specifically state what they are allowed to do to ensure that the organisation's environmental commitment is maintained;
5. provide sufficient resources, human and material, to ensure the proper implementation and control of the environmental management system; and
6. appoint an individual to be responsible for implementing and maintaining the requirements of the standard.

State Forests: current position

State Forests' new functional organisational structure has been defined in a series of detailed organisational charts. The organisation was formally broken into regions and each region into districts. The latest reorganisation does away with the regional structure and increases the size of the districts. Position descriptions were evident for most positions and these were subject to periodic revision based on organisational changes. However, up to date copies were not always readily available in the workplace and there was no systematic method of ensuring that individuals were aware of changes to their position description as they occurred.

Within an environmental management system, job descriptions for personnel, including those at operator level, who are responsible for activities which could impact on the environment should contain details of their environmental responsibilities, especially those associated with emergency activities. No process was evident for defining such activities or including specific environmental responsibility in an individual's position description.

Position descriptions should also include mention of responsibility for the environmental performance of contractors, especially at the regional level. State Forests uses a range of contractors and there is a clear need to ensure that their environmental performance both on and off site reflects favourably on the organisation and therefore responsibility for their management should be assigned.

Perusal of the revised organisational charts does not reveal any high-level responsibility for an

environmental management system. The position of Manager for Sustainable Forest Management, (reporting to the General Manager for Forest Policy) would seem to be the individual most likely to assume such a responsibility should State Forests elect to use an environmental management system as a mechanism to implement ecologically sustainable forest management.

Experience suggests that the responsibility for implementing an environmental management system cannot be assigned and must be accepted by the Chief Executive Officer and General Managers. Organisations which assign such a responsibility to an individual rarely provide the appointee with the resources and authority necessary to carry out this responsibility, since they are frequently only service providers and do not have line responsibility for the functional activities associated with the management of all the organisation's operations. The role of environmental management system facilitator, reporting to the Chief Executive Officer or a high-level committee of General Managers can be assigned without the need to provide increased levels of authority or significant resources to this appointee.

Senior managers need to be aware of the resources and commitment necessary to implement an environmental management system. The task is both time consuming and resource intensive, at least in the implementation stage, and should not be attempted unless management is totally committed. Ownership of the implementation process within the organisation is essential if the system is to be maintained effectively and the use of consultants should be minimised. State Forests must ensure that, if a second attempt is made to implement an environmental management system, there is total commitment from senior management, as the more attempts that are made the greater the resources required and the less likelihood of success as staff become increasingly frustrated and disillusioned over the lack of support and recognition for their efforts.

National Parks and Wildlife Service: current position

The Service has a well-defined, functional, organisational structure based on regions and districts which manage on-park activities, and zones which manage regulatory matters for off-park activities and for on-park activities when these fall under a regulatory framework. Position

descriptions and performance targets for individual appointments are required as a part of the organisation's human resource management process. Again, with respect to an environmental management system, job descriptions, including those at operator level, who are responsible for activities which could impact on the environment should contain details of their environmental responsibilities, especially those who are associated with emergency activities and are responsible for the environmental performance of contractors.

Comments made in the last two paragraphs under State Forests apply equally to National Parks and Wildlife Service.

Recommendation A7: State Forests and National Parks and Wildlife Service should:

- **identify and continually review activities that may have an impact on the environment or on effective environmental management;**
- **amend position descriptions to include the environmental responsibilities of all those positions identified above;**
- **amend all relevant position descriptions to include responsibility for the environmental performance of contractors, as appropriate and communicated to position holders;**
- **assign responsibility for the implementation of the management plan or system to the management group as a whole, and for the facilitation or coordination of the implementation process, to an appropriate individual; and**
- **ensure total commitment of senior management to the concept of an environmental management system before such a system is implemented, and ensure that adequate resources are provided to implement and sustain the system.**

Additional guidance

AS/NZS ISO 14004 Clause 4.3.2.3, AS/NZS ISO 14001 Clause 4.4.1 and Annex A.4.1 offer additional guidance on this element of the standard.

1.4.2 Training, awareness and competence (Clause 4.4.2)

What the standard says

The standard wants the organisation to ensure that:

1. procedures are in place to identify training needs;
2. personnel whose work has a significant impact on the environment are properly trained; and
3. procedures are maintained to make employees at each relevant function and level of the organisation aware of:
 - why they have to comply with the:
 - i. organisation's environmental policy and procedures
 - ii. environmental management system
 - the significant environmental impacts, actual or potential, of their work activities and the environmental benefits of improved personnel performance;
 - their roles and responsibilities in achieving conformity with environmental policy and procedures, the requirements of the environmental management system, including emergency preparedness and response requirements;
 - potential consequences of departure from specified operating procedures.
4. personnel who do work which can cause significant environmental impacts are competent on the basis of education, appropriate training and/or experience.

State Forests: current position

Discussion with head office and regional staff confirm that training relevant to the organisation's operations is occurring at all levels. However, there is no clear training strategy that relates the training activities to the organisation's mission, corporate plan, and issues such as sustainable forest management. As mentioned earlier, this is not to say that such training is not being provided but that there is no strategy to align it with higher corporate objectives.

Training within State Forests needs to be considered at several specified levels, as follows:

All Employees. Environmental awareness training is necessary to bring all employees up to the same level of knowledge on environmental issues, as reflected in an induction training program for new

employees. This training is considered as a one-off requirement and would cease when all employees have been trained and the training strategy implemented reflecting the levels of training shown below.

Induction. To introduce new staff or staff changing appointments to State Forests' vision, values and policies associated with the environment and the job they will be performing.

Technical. To provide the technical and/or operational skills necessary to perform forest operations, including those associated with the environmental impacts of the work.

Supervisory. To provide the skills needed to supervise the staff at all levels in the organisation and ensure the relevant degree of general environmental awareness.

Management. To provide the skills needed to manage and control the relevant managerial and other processes.

Refresher. To keep personnel up to date with the environmental significance of the work they perform and inform them of any changes in legislation, policy, or codes of practice which may effect their work.

While State Forests do conduct training, there was little to show that it was being conducted consistently, although information provided indicated that a training needs analysis had been performed in some areas. For example, no overall or regional training programs were seen for individual employees or for contractors, although it was evident that some employees and contractors undergo soil and water training as well as attending supervisor and other courses. Past courses appear to have been attribute-based and the newer courses competency-based. Induction training for regional staff is still completed in the workplace by workplace supervisors and no syllabus for such training was seen. It was noted that an induction training course is under development to ensure consistent training outcomes.

Training records at head office and regional level were not adequate in terms of a management system. Records of attendees at courses were not always complete, the course syllabus was not designed in a way which provided measurable outcomes, and the method of assessment was either inconsistent or was not effective in measuring the participants' understanding of the outcome. A number of courses were provided by

external trainers and no effective method of in-field supervision was evident to ensure the consistency of course delivery. New courses such as the supervisors' course were competency-based and appeared to redress some of the concerns expressed earlier in this paragraph.

It was noted under the new organisational structure that a training and development manager was to be appointed under the human resources manager, to overcome shortcomings in the previous structure. This is to be commended as training is an integral part of ensuring the effective delivery of the organisation's environmental policy and must be resourced at the appropriate level. A centralised approach to the development of a training strategy, coupled with centrally developed but regionally delivered common core competency-based courses using assessment methods appropriate for regional staff, will allow the transfer of personnel between regions with consistent skill levels and will make a positive contribution to the delivery of sustainable forest management.

National Parks and Wildlife Service: current position

Training policy is specified in the Human Resource Manual which details the process for identifying a training need and seeking approval for funding it through an approved training course. Under the human resource policy, each manager is to discuss with each subordinate any training necessary to enhance the employee's skills. Discussions with district/regional staff show that some managers maintain a comprehensive training program for all employees. However, this may not be consistent across all districts/regions and could not be confirmed, as a visit to a region was not possible.

Recommendation A8: State Forests and National Parks and Wildlife Service should:

- **develop competency standards for those personnel who do work which can cause a significant environmental impact;**
- **develop a training strategy which includes the conduct of a training needs analysis with the aim of identifying all those activities within the organisation that can have a significant environmental impact, and which deals with communications, motivation, and environmental awareness**

and technically related environmental training;

- **develop and implement procedures to manage, control and record the training process; and**
- **provide training to staff at each relevant function and level of the organisation, including contractors where appropriate, to make them aware of the need to:**
 - **know their roles and responsibilities in achieving conformity with environmental policy and procedures, and the requirements of the environmental management system, including emergency preparedness and response requirements;**
 - **understand the significant environmental impacts, actual or potential, of their work activities and the environmental benefits of improved personnel performance; and**
 - **know the potential consequences of departing from specified operating procedures.**

Additional guidance

AS/NZS ISO 14004 Clause 4.3.2.5, AS/NZS ISO 14001 Clause 4.4.2 and Annex A.4.2 offer additional guidance on this element of the standard.

1.4.3 Communication (Clause 4.4.3)

What the standard says

The standard wants the organisation to:

1. set up a procedure for controlling the receipt and responses to internal and external communications relating to the environmental activities of the organisation; and
2. document the internal and external communications mentioned above.

State Forests: current position

Discussion with staff and a perusal of State Forests documentation did not reveal an internal communication strategy. While the absence of such a strategy does not mean this is not occurring, there was no information to prove that an effective communication process exists across

the organisation. For example, a lot of communications within the organisation, certainly at a regional level, were not subject to documentation – and so could not be verified, should this prove necessary, to defend a prosecution or demonstrate something to the public.

The implementation of such a strategy would also ensure that communications being delivered to regional staff and through them to contractors were understood. For example, the codes of practice currently in use are expected to be used by 'State Forests managers, employees, contractors and other clients' yet the documents themselves are written in the expectation of a degree of literacy which may not have been achieved by all employees and contractors. Similarly, circulars are not written to cater for those with lower levels of literacy. Again it was noted that State Forests were tackling this, at least in part, through literacy surveys and were also aware of the reading and comprehension problems associated with in-field documentation.

With respect to external communications a strategy was under development and it was evident that a process existed for considering the views of parties interested in selected environmental issues. The use of community and focus groups to obtain the views of interested parties and the more formal placing of documents on public display, the use of harvest advisory boards, the Regulatory and Public Information Committee and other strategies are all appropriate in the context of a management system.

An integrated communication strategy may need to be developed to communicate effectively with interested parties such as employees, community groups, and the general public, any of which might become disenchanted over the organisation's response or its reporting of specific environmental issues and seek to publicise internal matters. This strategy should also be prepared to deal with inter-agency disputes and issues of cross-boundary jurisdiction or national significance.

AS/NZS ISO 14001 does not require organisations to report on their environmental performance except as required by law. State Forests should, however, report as fully as possible on its environmental impacts and objectives and targets. In determining what and how to report, management should be guided by relevant international codes of practice if criticism

of the reporting structure and content by environmental interest groups is to be avoided. For example, reports could include an organisational profile, details of employee and community involvement in the development and implementation of the environmental management system, and a consistent layout in terms of moving from policy, through management, releases, resource conservation, risk and compliance, to employee recognition and ending with interested party involvement.

National Parks and Wildlife Service: current position

The Service had an internal communication policy but the policy is aimed at defining downward communication, largely through regular meetings, and it did not describe upward or lateral communication effectively. It was noted that all policy and procedure manuals were to be accessible to all staff and available for purchase by the public.

The Service's external communications are largely governed by legislation and no policy was seen. However, it was noted that the 1995-96 Annual Report contained extensive coverage of the community consultation process and this would exceed the requirements of ISO 14001.

The 1995-96 Annual Report contains a comprehensive overview of the organisation's environmental activities and broad strategic outcomes. Future reports should cover both strategic and environmental performance outcomes.

Recommendation A9: State Forests management should:

- **give consideration to the development of a internal, external and integrated communications strategy;**
- **develop and implement procedures for the management and control of internal and external communications about environmental issues; and**
- **consider a layout defined in a recognised code of practice for the annual reporting of their environmental performance.**

National Parks and Wildlife Service management should:

- **revise its internal communications policy to better reflect the requirement for upward and lateral communication;**

- **develop and implement procedures for the management and control of internal and external communications about environmental issues; and**
- **consider a layout defined in a recognised code of practice for the annual reporting of their environmental performance.**

Additional guidance

AS/NZS ISO 14004 Clause 4.3.3.1, AS/NZS ISO 14001 Clause 4.4.3, Annex A.4.3 and the References 15 and 16 offer additional guidance on this element of the standard.

1.4.4 Environmental management system documentation (Clause 4.4.4)

What the standard says

The standard wants the organisation to document in paper or electronic form:

1. the core elements of the management system and how they interact with each other; and
2. provide direction to related documents such as procedures, work instructions, emergency plans, process information, standards, etc.

State Forests: current position

State Forests' documentation of the management and control of forest activities is comprehensive but disjointed. There is no policy about documentation in terms of its layout, format, technical content, use or control. There was apparently no central or regional index of documentation. This leads to inconsistencies and to the multiplication of local documents which may, unknown to the writer, duplicate and contradict a central document or lead to the development of a regional document whose content may be based on incorrect assumptions.

An environmental management system requires a hierarchy of documents not clearly present within State Forests' documentation system. This hierarchy starts with the organisation's environmental policy at the pinnacle and devolves to individual policies for each element of the standard, normally concentrated in an environmental policy manual. For example, the policy on contractor selection may emphasise the need to select contractors on the basis of past

environmental performance as well as other more conventional cost-based criteria. These policies are then cascaded throughout the organisation in procedures that state what and why something has to be done, where and when it has to be done, and who must do it. Where necessary, work instructions then follow which state how it has to be done.

These system-based policies, procedures and work instructions are complemented by similar process-based documents such as a conservation policy, plans, procedures and work instructions which reflect what, when, why, where, by whom and how conservation will be achieved. The environmental management system does not specify a particular method or medium for achieving this hierarchy of documentation. State Forests may seek to continue to use their existing documentation structure in terms of plans, circulars, local documents, operational manuals, codes of practice, etc., but the role of these documents will need to be more precisely defined if they are to add value to the management of the organisational process.

National Parks and Wildlife Service: current position

Although the Service has a structured documentation system in which high-level policy is documented and supported in some areas with procedures, there was no policy on document hierarchy. While it was evident that head office documentation was well structured, there was information to suggest that regional/district/zone documentation was not consistent or adequately structured.

As mentioned earlier, a documentation policy is required so that employees and members of the public can understand the role of documentation in delivering consistent organisational performance. It is also necessary to compensate for organisations which have traditionally relied on the experience and stability of their work force and may, through changes beyond their control such as the inability to pay market rates, or changes in government policy, be required to reduce staff, cut operating costs, or replace older staff with less experienced staff.

Recommendation A10: State Forests and National Parks and Wildlife Service should:

- **develop documentation policies which meet the requirements of AS/NZS ISO 14001; and**
- **align existing documentation with the document hierarchy, subject to management and control as defined in the documentation policy.**

Additional guidance

AS/NZS ISO 14004 Clause 4.3.3.2, AS/NZS ISO 14001 Clause 4.4.4 and Annex A4.4 offer additional guidance on this element of the standard.

1.4.5 Document control (Clause 4.4.5)

What the standard says

The standard wants the organisation to:

1. set up and keep in place a procedure for controlling the documents which are needed to manage an ISO 14001 based environmental management system, making sure:
 - that all documents are suitable and approved for use,
 - documents needed to do the work are current and handy for staff to use, and
 - out of date documents are not still in use.
2. ensure that the documentation is legible, dated, readily identifiable, maintained properly and able to manage changes to the system effectively.

State Forests: current position

Perusal of many documents of the State Forests' management system shows that document control is at best inadequate and at worst non-existent. For example, few documents are complete with a unique identification number, date of issue, authorisation (ownership) signature, revision status and page numbering. Manuals or plans frequently do not state the number of pages they should contain or do not specify a list of effective pages.

Lists of available documents, if they exist, are generally out of date and obsolete documents are mixed up with current documents and not marked to indicate their obsolescence. Where documents are used, they are rarely referenced in the work process and the currency of documents is

generally suspect. For example, some area management plans have not been updated for ten years or more. The management and control of pollution control licences and other legal documents was more systematic but still not adequate in terms of an environmental management system. Document distribution records were rarely kept and it was not possible to determine who had what documents or how current they were.

The absence of document control means that workplace activities are subject to unnecessary variation through the use of incorrect or out of date documents. This could lead to prosecution by a regulating body because of an incorrect response to a particular set of circumstances, and in the event of a prosecution, since it is unlikely that the reference document in use could be established with any certainty, this could jeopardise any defence put forward by State Forests.

National Parks and Wildlife Service: current position

A review of some of the Service's policy documentation showed that there had been a major policy development between 1989 and 1993, followed by further policy development in 1995-96, some of which is still going on. However, some of the documentation had not been amended since its initial development. Other, more modern documents had been subject to amendment and new documents were still under development.

Perusal of these documents also revealed that in a number of cases they were not copy numbered, there was no list of effective pages and no amendment status. Loose documents were frequently inadequately labelled, contained no indication of their issue status or of the number of pages that should be present. There was no centralised master list of documents and document sponsors and not all document sponsors had a list of document holders.

The comments made in the last paragraph under State Forests apply equally to the National Parks and Wildlife Service.

Recommendation A11: State Forests and National Parks and Wildlife Service should implement a document control system for all documents related to the management of both organisations' significant impacts.

Additional guidance

AS/NZS ISO 14004 Clause 4.3.3.3, AS/NZS ISO 14001 Clause 4.4.5, Annex A.4.5 and BS 7750 Clause 4.7.2 and Annex A.7 offer additional guidance on this element of the standard.

1.4.6 Operational control (Clause 4.4.6)

What the standard says

The standard wants the organisation to:

1. identify and plan all activities, functions and processes performed by the organisation that are associated with its significant environmental aspects and which fall within the scope of its policy, objectives and targets; and
2. make sure all activities, functions and processes so identified are controlled.

This element, although comprising one paragraph in the standard, is one of the most difficult to understand and comply with. In order to simplify the explanation of what is required, it is easier to break it down into the following sub-elements:

- Planning and control
- Work procedures and instructions
- Verification
- Workmanship
- New processes
- Equipment control and maintenance

State Forests and National Parks and Wildlife Service: current position

State Forests and National Parks and Wildlife Service activities create a number of environmental impacts as reflected in such documents as environmental impact statements, other assessments, and plans. However, the link between an activity and the significant impact occurring at a particular site is not always clear and readily discernible. Further, the situation regarding normal, abnormal and emergency circumstances, along with those environmental aspects over which State Forests and the Service has control or can influence, is a further complication which neither organisation's current management system resolves.

Planning and control. It is essential to plan and control the activities performed by State Forests

and the Service that are associated with its significant aspects. This can only be achieved if the interaction with the environment at each stage of the activity, in terms of input resource requirements and outputs in terms of unwanted waste or other by-products, is known. In forest operations, these activities may include road and infrastructure maintenance or building, habitat or other maintenance, harvesting, site security, equipment maintenance, chemical handling and storage, waste disposal, and transportation to and from the site.

Planning in State Forests and the Service is generally well documented in a variety of operational, harvest, habitat, conservation, fire and other management plans. These define protection control measures which seek to minimise the environmental impact caused by forest operations as identified through the environmental impact assessment process. The plans may also refer to other requirements specified in pollution control licences, soil erosion and other protocols. They do not, however, always link particular activities to specific impacts and do not deal with the broader issues of influence in terms of ISO 14001.

Recommendation A12: Process flow diagrams should be developed for the forest operations undertaken by State Forests and National Parks and Wildlife Service and these should be used to link activities with their environmental aspects and impacts.

Work procedures and instructions. Procedures and work instructions are needed to ensure work tasks are completed in a manner which is consistent with an organisation's environmental policy and associated objectives and targets.

State Forests uses codes of practice and selected circulars to provide guidance to staff and contractors on work processes. These guidance documents are well developed but are not always supported by more technical guidance on how to undertake a particular activity such as the construction of particular drain types, road grading and so on. These may be supplemented by regional documents but the approval process for all these documents is not well defined.

The Service has some documents which contain more detailed information on work practices, such as the Threatened Species Conservation Act and fire protocols. However, there was little information about any consistent set of roading, drainage and building practices or other

maintenance activities. Regions and districts have their own practices but these were not always well documented.

Recommendation A13: State Forests and National Parks and Wildlife Service should:

- **develop and implement procedures including:**
 - **the identification, management, control and assessment of the procedure and work instruction development process; and**
 - **those necessary to manage the organisation's significant aspects.**

Verification. Monitoring and control of the activities of State Forests and National Parks and Wildlife Service and their contractors' operations ensure that the outcome of each activity provides the desired environmental performance in a predictable and cost-effective way. Achieving such consistency requires the identification of points in the work flow which serve to monitor and control the outcome of an activity or the service delivery process, including variables such as individual staff skills, working conditions and any equipment used in the process. Decisions on the selection of these points are based on an assessment of the impact of each work activity on the environment. For example, during a felling process, the incorrect felling of a tree into a habitat reserve and its subsequent removal may damage the habitat unnecessarily if it is not done correctly. Such an activity may need to be supervised because of its critical nature.

No evidence was seen that such requirements had been identified in relation to environmentally related issues under current workplace process requirements.

Recommendation A14: State Forests and National Parks and Wildlife Service should amend plans/procedures/quality control plans/work instructions, etc. to include the identification of work flow control points for environmentally related issues, as appropriate.

Workmanship. How well the job is done, and therefore how effectively any adverse environmental impacts are minimised, depends on many things including the training given, the degree of supervision, subcontractor /operator motivation, the quality of the procedure and work instructions and the tools and equipment provided to do the job. No evidence was available to show

that workmanship standards have been set, especially for the contractor, for environmentally critical operations or tasks – for example, the mixing of chemicals, cleaning of equipment or the compilation of accident/incident reports.

Recommendation A15: State Forests and National Parks and Wildlife Service ensure that workmanship standards are set, displayed where appropriate, or documented, and that senior staff record when inspections take place to monitor adherence to the standards.

New processes. All processes are subject to change as time passes and experience is gained in their operation. These changes must not be considered in isolation, since a beneficial change in one part of the process can often have a detrimental effect in another part. Process changes or new processes must be reviewed before being implemented, to ensure that they do not alter the organisation's environmental aspects or have significant adverse impacts. No procedures were evident within State Forests or the Service that required the management and control of new processes or changes to existing process in environmental terms.

Recommendation A16: State Forests and National Parks and Wildlife Service should amend existing procedures to include environmental considerations in the introduction and control of new processes, materials or techniques.

Equipment control and maintenance. The nature of harvesting and forest maintenance is such that the efficient and continued operation of mechanical equipment is essential. Achieving uninterrupted operation of equipment is a function of such factors as the level of preventive maintenance, adherence to well-defined maintenance schedules, documented maintenance standards and equipment history, an effective maintenance management system and an appropriate number of trained staff and other resources.

The environmental damage from equipment failure may well be severe in that the impact will be sudden and there could be secondary impacts from it, for instance, hydraulic line failure causing a spill of hydraulic fluid on the forest floor, leading to the inability to finish a drain before a rain storm moves through the forest. No evidence was available to show that State Forests' or the Services' equipment maintenance philosophy or that of its contractors took into consideration the

environmental impacts likely to be caused as a result of such failures.

Recommendation A17: State Forests and National Parks and Wildlife Service should conduct an assessment of equipment used in harvesting and other operations to identify those pieces of equipment whose failure could have a significant environmental impact. Equipment so identified should be subject to a program of preventive maintenance based on sound engineering practices.

Additional guidance

AS/NZS ISO 14004 Clause 4.3.3.4, AS/NZS ISO 14001 Clause 4.4.6, Annex A4.6 offer additional guidance on this element of the standard.

1.4.7 Emergency preparedness and response (Clause 4.4.7)

What the standard says

The standard wants the organisation to:

1. establish and maintain procedures to:
 - identify potential emergency situations and permit effective response to real situations, and
 - prevent and mitigate the environmental impacts caused by emergency situations;
2. assess and revise the procedures after the occurrence of such situations; and
3. periodically cost the emergency procedures, where practicable.

State Forests and National Parks and Wildlife Service: current position

The most significant possible emergency in forest operations is wildfire. Other likely emergencies may involve human health, the failure of a drain or erosion bank, or a vehicle accident. The management of wildfire emergencies is well documented in both organisations and associated plans and fire planning requirements are subject to regular exercises.

Recommendation A18: State Forests and National Parks and Wildlife Service should:

- make a complete list of possible emergencies, including those likely to be generated by non-operational activities and external sources;

- **develop plans to respond to such emergencies;**
- **develop procedures to identify new and changed circumstances in which emergencies may occur and ensure the development of plans for the management of any new emergencies that are identified, including amelioration of the likely effects;**
- **exercise emergency plans at regular intervals and review the plans after such exercises or any real situations.**

Additional guidance

AS/NZS ISO 14004 Clause 4.3.3.5, AS/NZS ISO 14001 Clause 4.4.7 offer additional guidance on this element of the standard.

Comments

Identification of circumstances in which emergencies may arise in forest operations should result from the completion of the work associated with identifying the organisation's significant environmental impacts. Typically, more general circumstances may include accidents, fire, flood, lightning strike, sabotage, chemical, fuel or oil spillage and accidents involving motor vehicles carrying dangerous goods.

1.5 Checking and corrective action (clause 4.5)

1.5.1 Monitoring and measurement (Clause 4.5.1)

What the standard says

The standard wants the organisation to:

1. implement and maintain procedures to:
 - periodically evaluate conformity with relevant environmental legislation and regulations, and
 - monitor and measure those key characteristics of its operation that can have a significant impact on the environment, including information to track performance, relevant operational controls and conformance with the organisation's objectives and targets
2. ensure monitoring equipment is calibrated and maintained and that the records of this process are retained.

State Forests: current position

Monitoring and measurement in State Forests' activities is not well defined. Environmental impact statements, harvest plans, pollution control licences and other documents contain a requirement to monitor and measure. However, discussion with operational staff did not reveal a ready familiarity with the monitoring or measuring requirements in these documents. For example, it was not always possible to determine clearly whether the monitoring requirements of the environmental impact statement were being met.

Discussions with regional staff revealed that monitoring and measurement results were subject to a regular analysis and review but that the results of the review and the subsequent action were not always adequately documented. Further, there was no documentation to demonstrate that any higher review took place to ensure that the monitoring and measurement process was reviewed for confirmation that it was meeting the original intent of the process. For example, no review was evident of the monitoring requirements of the Eden environmental impact statement to determine whether circumstances had changed and new monitoring requirements should be established.

National Parks and Wildlife Service: current position

The monitoring and measurement of the Service activities is not well defined, nor are the results effectively documented. Most documents examined in the Service contained objectives, and in some cases detailed criteria; however, few if any documents, except perhaps the corporate plan, in terms of the strategic management cycle, contained any monitoring component.

Despite the absence of documented requirements to monitor environmental performance, monitoring does take place. However, this is generally discretionary and is not consistent between regions/districts/zones and the results are not always documented adequately. Documented monitoring programs and associated records are necessary to demonstrate to the public and other interested parties the effectiveness of the Service's management of its assets. No information was seen that suggested that the organisation as a whole was monitoring legal compliance.

Recommendation A19: State Forests and National Parks and Wildlife Service should

develop procedures to enable the identification and maintenance of the appropriate environmental parameters to be monitored to show conformity with the relevant legal and other internal environmental standards and environmental objectives and targets.

Additional guidance

AS/NZS ISO 14004 Clause 4.4.2 and AS/NZS ISO 14001 Clause 4.5.1. offer additional guidance on this element of the standard.

1.5.2 Non conformance and corrective and preventive action (Clause 4.5.2)

What the standard says

The standard wants the organisation to:

1. maintain procedures for managing and controlling any incidence of non-conformance with regulations;
2. take action to mitigate any environmental impacts resulting from non-conformance;
3. take action to stop ensure non-conformance does not recur, either in the short term or at some time in the future;
4. make sure any corrective action works both in the short and long-term;
5. look at all work-related environmental and other records, customer complaints, staff suggestions, etc. regularly to find any problems that are likely to cause non-conformance in the future and take action to fix them.
6. prioritise problems according to the impact the problem has on the environment;
7. change procedures where there is a need to do so to prevent non-conformance.

State Forests: current position

The need to identify environmental activities that do not conform to regulations, etc. in State Forests is not well documented. Codes of practice outline performance monitoring in terms of final reporting and auditing and do not in general cover quality control issues such as non-conformance reporting. The Harvesting Inspection Guidance Note, an internal document, does however, include a requirement to report non-conformances in respect of breaches of licence or harvest plan

conditions. Compliance with State Forests' Codes of Forest Practices is a requirement of a contractor's licence conditions but little information was available to show that the reporting requirements of such codes were effective in encouraging non-conformance reporting by contractors.

Current non-conformance reporting activities are generally reactive and no preventive requirement was found in the codes or other documentation. Such a requirement may include the monitoring of past incidents/non-conformances to identify potential future incidents/ non-conformances.

National Parks and Wildlife Service: current position

As with State Forests, the need to identify non-conforming environmental activities in the Service is not well documented. Without this information, the Service will be unable to identify and take the necessary corrective and/or preventive action to prevent a recurrence or ameliorate the impact of an occurrence. Again, this is not to say that such action is not already being taken; the problem is that a requirement to take it is not defined in all cases and the action taken is not well recorded. In such circumstances it is extremely difficult to improve the organisation's environmental performance.

Recommendation A20: State Forests and National Parks and Wildlife Service should develop and promulgate a non-conformity, corrective and preventive action procedure.

Additional guidance

AS/NZS ISO 14004 Clause 4.5.3, ISO 14001 Clause 4.5.2 and Annex A.5.2 and BS 7750 Clause 4.8.4 and Annex A.8 offer additional guidance on this element of the standard.

1.5.3 Records (Clause 4.5.3)

What the standard says

The standard wants the organisation to:

1. develop procedures for the identification, maintenance and disposition of environmental records;
2. keep environmental-related records which can prove the environmental management system is working properly;

3. ensure that records to be kept are named or numbered, listed, filed, stored, able to be recalled at any time they are needed and kept from damage or deterioration; and
4. keep records for a definite period, which must be stated.

State Forests: current position

The quality and quantity of environmental records retained in State Forests varies with the degree of importance placed on them by the relevant manager. No policy or guidance was seen on what records were to be retained or the retention period. The absence of a records policy and records which confirm compliance with particular aspects of State Forests' operations could leave the organisation vulnerable in the event of a prosecution with respect to licence or other conditions.

Implementation of an environmental management system will require the establishment and maintenance of procedures for identification, collection, indexing, filing, storage, maintenance and disposition of environmental records in such away as to ensure their permanency, retrievability and maintenance in an environment free from deterioration, damage or loss.

National Parks and Wildlife Service: current position

The Service should be commended on the recently introduced records management system which draws on the content of the Australian standard for records management AS 4390. When this system is fully implemented, it will prove invaluable in aiding the Service to demonstrate its commitment to the environmental management of its assets.

Recommendation A21: State Forests should develop policy and procedures in accordance with the requirements of the standard for the identification of environmental records to be raised and retained.

Comment

Sorting out what records are to be kept can be a problem until the organisation has had some experience with this element of the standard. In the first instance, it is better to keep more records than is necessary and then cull the ones not needed than it is not to have enough records to

prove that the environmental management system is working properly.

Additional guidance

AS/NZS ISO 14004 Clause 4.4.3, AS/NZS ISO 14001 Clause 4.5.3 and Annex A.5.3 offer additional guidance on this element of the standard.

1.5.4 Environmental management system audits (Clause 4.5.4)

What the standard says

The standard wants the organisation to:

1. carry out audits to:
 - determine whether or not the environmental management system
 - i. conforms to planned arrangements for environmental management, and
 - ii. has been properly implemented and maintained;
 - provide information on the results of the assessment to the management assessment process; and
2. develop a program and procedures for periodic environmental management system audits with a schedule based on the environmental importance of the activity to be audited and the results of past audits.

State Forests: current position

State Forests currently has a sound internal audit program in place which is risk-based. The program includes regular audits of regional activities including harvest plans. However, the current program does not seem to cover the broader issues such as meeting corporate objectives, effectiveness of organisational policy or management strategies or reviews. Should State Forests implement an environmental management system, this program would have to be strengthened and internal auditing would have to be introduced at the district level.

National Parks and Wildlife Service: current position

The Service does not have an internal audit program in place which meets the requirements of this standard.

Recommendation A22: State Forests should strengthen the scope of internal audits to include a broader range of higher level auditing task.

National Parks and Wildlife Service should implement an internal audit program as soon as possible to enable the organisation to demonstrate its commitment to environmental management.

Additional guidance

AS/NZS ISO 14004 Clause 4.4.5, AS/NZS ISO 14001 Clause 4.5.4 and Annex A.5.4, AS/NZS ISO 14010, 14011-1 and 14012 offer additional guidance on this element of the standard.

1.6 Management review (Clause 4.6)

What the standard says

The standard wants the organisation to ensure that the environmental management system is:

1. being applied across the whole organisation and its activities effectively; and
2. continues to be suitable for the organisation's needs.

State Forests and National Parks and Wildlife Service: current position

Although neither organisation conducts management reviews of the kind required by this

standard, it was evident that management reviews do take place. For example, State Forests recently reviewed and identified the absence of supportive policies as an issue of significance and similarly the Service identified the absence of effective monitoring as an issue of significance for it.

Recommendation A23: State Forests and National Parks and Wildlife Service should establish and document a management review process to meet the requirements of ISO 14001.

Comment

Management review meetings would normally be held quarterly or half yearly, by the most senior person in the organisation (chief executive officer, director-general, managing director, etc) and may be combined with other meetings. The review should consider such factors as the continuing suitability of environmental policy, regulatory developments, budgetary considerations, concerns of interested parties, changing activities of the organisation, changes in environmental sensitivity of surrounding areas, environmental and planning concerns and professional standards and practices.

Additional guidance

AS/NZS ISO 14004 Clause 4.5, AS/NZS ISO 14001 Clause 4.6 and Annex A4.6 and BS 7750 Clause 4.11 and Annex A.11 offer additional guidance on this element of the standard.

APPENDIX B

SUMMARY OF RECOMMENDATIONS BY CHAPTER

CHAPTER 2

Recommendation 2.1: The legislation setting up the National Parks and Wildlife Service as manager of conservation areas in public ownership, and State Forests as manager of production forests in public ownership should be amended so as to clearly identify the objectives of these agencies and the areas which they manage in terms of the demands of ecologically sustainable forest management. In particular, it should be made clear that the provision of recreational opportunities in land located in the proposed CAR forest reserve system should be subservient to the conservation of biological diversity.

Recommendation 2.2: In the short term, an inter-agency coordinating group involving existing regulatory agencies should be established to:

- better coordinate planning in relation to cross-tenure issues;
- ensure consistency of plans with the regional forest agreement and other hierarchical components of the planning structure;
- coordinate the process of granting licences and approvals;
- coordinate independent audits of processes and outcomes;
- ensure better implementation and enforcement of regulations;
- improve response to public concerns about inadequate compliance with policies and codes; and
- effectively report to the public and government of the findings from audits.

However, even in the short term, it is essential that the following functions are managed and approved by a single agency:

- responsibility for ensuring that forests-related plans address management requirements for ecological sustainability and specify ecologically sustainable management targets (such plans include, for example, management area plans for public forests; regional vegetation and private forest management

plans; and local and regional environmental plans);

- responsibility for establishing an effective code of forest practice system, including the approval of codes and methods for their implementation (See Recommendation 3.18);
- responsibility for ensuring that monitoring (by the forest manager) of agreed ecologically sustainable forest management outcomes is conducted (see Recommendation 6.1).

Within three years, the position of forest regulator should be established as a means of more effectively performing the above functions which are necessary for achieving ecologically sustainable forest management and to approve operations not adequately addressed by codes of practice or approved plans of management.

Recommendation 2.3: There is a need to strengthen cooperation and coordination between Government agencies so as to achieve integrated management for conservation, wood production and other values in both public and private forests. Specifically:

- active management across tenures of the comprehensive, adequate and representative (CAR) reserve system (formal and informal reserves and areas managed by prescription);
- complementary management of general wood production zones within State Forest;
- effective threat abatement practices;
- an appropriate balance between recreation and conservation;
- more effective management and use of resource information supporting ecologically sustainable forest management ;
- more effective use of expertise;
- support for private native forest management;
- better strategic management area plans;
- better coordination of research and development;
- more effective communication of ecologically sustainable forest management outcomes.

In order to promote cultural change within existing forest agencies, the formation of an interdepartmental coordinating committee may provide some interim benefit. However, in the medium-term, a more effective option would be the formation of a Natural Resources Management Agency with management responsibility for all

public forested land and a support function for managers of private forested land.

This recommendation is contingent upon the creation and filling of the position of forest regulator in order to assist in maintaining a balance between forest uses. The proposed natural resources agency will be guided in balancing conservation and wood production objectives by objectives specified in RFAs, requirements of the external regulator, and by other government policy.

A logical corollary of the proposals in Recommendations 2.2 and 2.3 will be to extend them so as to cover not only forests but all natural resources. However, this is outside the EWG terms of reference.

Recommendation 2.4: Private forest managers should be given assistance with the implementation of ecologically sustainable forest management, including:

- technical assistance in the preparation of conservation management plans, private forest management plans and individual timber harvesting plans;
- negotiation of conservation agreements; and
- the provision of advice and training in relation to codes of practice.

A Private Forest support Unit should be established to assist forest managers.

Recommendation 2.5: A whole of government process to develop natural resources legislation should be put in place. Parts 3 and 4 of the *Environmental Planning and Assessment Act 1995* should be considered as a potential vehicle for integrating natural resource management in view of the following characteristics of that legislation:

- broad plan-making powers;
- a well-developed assessment procedures and approvals process;
- a well-understood system of community participation including review by the courts;
- potential to move beyond constraints on land use to active management;
- potential applicability to both public and private land.

In the short term, to reduce complexity at the level of operational regulation and as a move towards a 'one-stop shop':

- there should be a review of separate requirements for approvals under existing legislation with a view to replacing them with concurrence procedures.

Recommendation 2.6: The Environmental Planning and Assessment Act should be amended so as to enable Ministers other than the Minister for Urban Affairs and Planning to make environmental planning instruments. Appropriate arrangements should be made to ensure consistency between instruments.

Recommendation 2.7: Regional vegetation committees and authorised officers should have powers of entry over private land for the purposes of regional vegetation management planning.

Recommendation 2.8: regional vegetation management plans should clearly indicate areas of private land necessary to complete the CAR reserve system and secure their protection through prohibitions on clearing and the conclusion with landholders of registered property agreements, which run with the land. These should deliver to landholders attractive financial incentives to manage the land in a way which is consistent with conservation objectives.

Recommendation 2.9: Strategic and operational planning decisions about the protection of native vegetation from subdivision pressures should be brought within the *Native Vegetation Conservation Act* in order to ensure that its conservation is considered in a regional context.

Recommendation 2.10: In order to reinforce the importance of State Forests of New South Wales's commitment to the policy objectives, the expert working group recommends that State Forests of New South Wales:

- commits itself to the development of those general and specific policies necessary to implement national and state Government environment and forest policies, and the organisation's corporate objectives;
- documents for staff a clear linkage between legislation, corporate and other policies, strategic plans, operational and other processes, and audit and review processes; and, more specifically, the importance of the hierarchy in delivering ecologically sustainable forest management principles; and
- develops a policy which, among other things, recognises the ecological and silvicultural principles upon which silvicultural practice must be based, the range of values for which forests are now managed, the need to integrate

wood production and environmental objectives through silvicultural practice, and the diversity in silvicultural practice needed to achieve multiple-use objectives.

CHAPTER 3

Recommendation 3.1: Information collation, analysis, communication and dissemination for delivery of ecologically sustainable forest management in New South Wales should be improved by:

- storing, analysing and disseminating State-wide information required for delivering ecologically sustainable forest management, including all existing digital, biophysical, socio-economic and cultural heritage data;
- developing protocols for data collection;
- maintaining standards of data quality, storage and transfer;
- identifying gaps in current knowledge;
- guidance on data ‘capture’ (collection) and inventory activities;
- better training and advice to staff by agencies
- facilitating the free exchange of data between government agencies and making data available to stakeholders, local councils, and the public; and
- provision of existing information to interested parties for the cost of data retrieval and handling.

A single forest resource information unit should be created within the New South Wales Government to take responsibility for information management.

Recommendation 3.2: That the New South Wales Government take legal advice on the right to copyright and trade biodiversity records. Departments should only accept records into their databases on condition that they be available for placement in the public domain. Some records may be quarantined from general public access where it can be shown that release would pose a significant threat to population survival (for example, species subject to wildlife trade).

Recommendation 3.3: That the New South Wales Biodiversity Survey Program be implemented as a matter of urgency subject to modification to improve and guarantee low cost delivery of information to stakeholders and private and public planners and managers.

Recommendation 3.4: That all environmental data (including vegetation community maps, threatened species distribution maps and models, and threatened species records) generated and held by Government after completion of regional RFA agreements be made available to the general public, stakeholders and planners at no more than the cost of data retrieval and handling.

Recommendation 3.5: Development proposals for forests should be exempt from requirements to undertake 8-point tests and environmental impact statements where:

- they are within specified zones identified on proposed regional vegetation management plans and are incorporated into local environmental plans and regional environmental plans;
- comprehensive regional environmental surveys have been undertaken;
- impacts of activities are known with a high level of scientific certainty;
- approved codes of practice have been adopted for the proposed activities; and
- effective monitoring and enforcement procedures are in place.

Recommendation 3.6: That the 8 point test in the Threatened Species Conservation Act be revised to:

- better reflect regional criteria and targets used for monitoring and delivery of ecologically sustainable forest management;
- specify minimum standards for biodiversity survey and impact assessment;
- specify exemptions from the 8 point test process (for example where proponents adhere to approved codes of practice, undertake activities under approved property management plans and vegetation management plans or within exclusion zones designated under regional planning instruments (regional environment plans, local environment plans, property management plans and proposed regional vegetation management plans).

Recommendation 3.7: The Threatened Species Conservation Act be modified to require approval of 8 point tests by the National Parks and Wildlife Service or an independent regulatory agency with appropriate biodiversity expertise.

Recommendation 3.8: That the Threatened Species Conservation Act be amended to require

proponents to consult with the Forest Regulator early in the assessment process to maximise opportunity for modification of activities and proposals to avoid significant impacts where possible.

Recommendation 3.9: Local Government Councils and regulators develop and implement decision support systems for all major land uses to facilitate cost effective assessment of impacts on threatened species habitats and delivery of consistent and transparent significance tests.

Recommendation 3.10: Guidelines be prepared for determining when activities have a significant impact under the 8 point test based on regional targets for delivery of ecologically sustainable forest management and other biodiversity conservation criteria.

Recommendation 3.11: All ecological communities on private land which are inadequately represented in the CAR reserve system should be considered for listing as endangered ecological communities under the Threatened Species Conservation Act to facilitate protection from potential clearing and degradation.

Recommendation 3.12: Fox and cat predation be listed as a threatening process under the TSC Act and that threat abatement plans should be prepared to reduce the extent and impact of fox and cat predation, particularly on public lands where conservation is a priority.

Recommendation 3.13: The potential conflict between the objects of the Rural Lands Protection Act and ecologically sustainable forest management principle 1 be removed to ensure the protection and maintenance of dingo populations on public forests.

Recommendation 3.14: A threat abatement unit should be created to develop regional cross-tenure threat abatement plans (to counter significant threatening processes) and to implement recovery plans for threatened species.

Recommendation 3.15: Current resourcing for threat abatement, particularly fox and cat control, be increased substantially (for example, by an order of magnitude).

Recommendation 3.16: That current legislation be modified to enable officers of National Parks and Wildlife Service to enter private land for the purpose of threatened species' survey and management.

Recommendation 3.17: Threat abatement plans must be prepared for all recognised major threatening processes (including fox and cat predation, clearing on private land, loss of tree hollows, grazing, frequent burning, weed invasion and disturbance by exotic animals) as a matter of urgency (within three years). These plans should be prepared prior to or concurrently with recovery plans prepared for individual threatened species significantly affected by these processes. Recovery plans should be prepared for groups of threatened species affected by common threatening processes and prioritised according to extinction risk. Consideration should be given to extending completion dates for individual recovery plans for threatened species at low risk.

Recommendation 3.18: Application of effective codes of practice to guide planning and operations is critical to achieving ecologically sustainable forest management, but currently codes are only applied in a significant way in public wood production forests.

The role of codes of practice in supporting the implementation of ecologically sustainable forest management in New South Wales should be expanded by:

- developing and approving legally binding codes to address all important activities across all land tenures in New South Wales forests, including wood production, conservation reserve management, grazing, pest management and clearing.
- ensuring that such codes contain sufficient detail to guide protection of environmental values at appropriate scales;
- providing adequate resources to expedite the development of such codes and their effective implementation in forested areas;
- implementing codes within the framework of an environmental management system in public forests to facilitate:
 - agencies and organisations implementing codes to demonstrate compliance with codes through independent means;
 - regular public review processes to ensure that codes reflect continual improvement and best-practice concepts.

Recommendation 3.19: As some codes of practice and conservation protocols are necessarily precautionary at the present time, codes should be subject to ongoing fine tuning and regional modification on the basis of

independent expert advice and the results of new research. Any changes to codes of practice should flow through to Conditions of Consent for approved activities and this should be the preferred mechanism for progressive refinement and modification of environmental protection standards rather than undertaking new environmental impact statements and species impact statements at regular intervals.

Recommendation 3.20: A code of practice be developed for regulation of clearing on all tenures including residential lands, and the code specify minimum levels of vegetation retention and provide guidelines for the maintenance of corridors and links.

Recommendation 3.21: The 8 point test be modified to include provision for assessment of cumulative impacts and consideration of regional targets for vegetation retention.

Recommendation 3.22: The current system of project-based assessment and approval for private forests should be replaced by one based on:

- regional (cross-tenure) land use planning (for example, regional vegetation management plans);
- preparation of a private forest management plan;
- use of codes of practice for all significant activities within each planning zone;
- preparing private forestry management plans, where forestry is proposed on specific sites;
- enhanced monitoring by the forest manager; and
- periodic review of the private forest management plan and its outcomes in terms of ecological sustainability, undertaken by the forest regulator.

Recommendation 3.23: Coordinated cross-tenure plans for habitat corridors and links across all private and public tenures should be developed.

Recommendation 3.24: The development of a regional approach to private forest management based on regional vegetation management plans and private forest management plans should be expedited. Improved vegetation management plans should use information derived from comprehensive regional environmental surveys that take into account the conservation status of forest ecosystems across all tenures and consider such elements as biodiversity, soil, water and cultural heritage. The vegetation plans must also

acknowledge the fundamental distinction between clearing for agricultural and residential purposes and sustainable native forest management.

Committees preparing regional vegetation management plans must possess adequate technical expertise in relation to the science/practices involved in ecologically sustainable forest management. Processes to effectively capture relevant information need to be developed.

In terms of the forest resource, regional vegetation management plans must:

- assess effects of management practices on individual forest values at an appropriate scale, which may be larger or smaller than the area covered by the plan, when setting zone boundaries;
- include minimum targets consistent with regional determination of the comprehensive, adequate and representative (CAR) reserve system for retention of forest cover;
- indicate specific zones and procedures essential to meet CAR reservation targets for forest communities that are inadequately protected on public land;
- maintain or increase the values related to ecologically sustainable forest management above regional targets;
- identify areas of forest suitable for restoration;
- contain a requirement for monitoring compliance with plans;
- include coordinated cross-tenure plans for habitat corridors and links in and between forests across all tenures; and
- involve landholders at an early stage in the planning process.

Private forest management plans should be prepared according to strict guidelines that:

- include systematic vegetation, habitat and fauna surveys as a foundation for planning;
- implement standardised 'clearing codes' to maintain forest connectivity across tenures;
- maximise opportunities for development trade-offs in urban areas as an incentive for conservation.

Recommendation 3.25: Private forest management plans and threat abatement plans should be prepared to an approved standard and approved by the forest regulator.

Recommendation 3.26: Compulsory codes of practice designed to achieve sustainable management of private native forests must be put in place. An appropriate vehicle would be a State environmental planning policy.

Recommendation 3.27: The current program of forest inventory, growth plot measurement, and growth modelling should be maintained and improved post-RFA. This is essential in order to achieve the key objectives of sustainable wood production. External peer review of systems, and the use of expertise outside State Forests of New South Wales need to be part of on-going efforts to improve spatial prediction of forest growth, including the effects of contrasting silvicultural practices on long-term forest production.

Recommendation 3.28: A silvicultural strategy should be prepared for New South Wales forests. This should be based on an analysis of the present forest condition and, for each forest type, address:

- the environmental relationships of the forest types - and the relevance of this to silvicultural practice;
- the ecological and silvicultural attributes of species and stand dynamic processes;
- ways of achieving full site regeneration;
- environmental and economic values of species and communities;
- an appropriate mix of silvicultural methods which can be used to achieve a set of management objectives;
- practices to restore degraded forest in an environmentally sensitive way.

Recommendation 3.29: State Forests of New South Wales address the need to develop within the native forests the range of size classes (each in a dynamic condition) required to deliver ecologically sustainable product yields.

Recommendation 3.30 State Forests of New South Wales ensure that ecological and silvicultural expertise, which its professional staff will need in order to achieve management objectives and maintain ecologically sustainable ecosystems, is enhanced through appropriate training and education programs.

Recommendation 3.31: That State Forests of New South Wales incorporate within its fire management strategy the principle that all available social, cultural, scientific and technical knowledge be used in determining a socially acceptable balance between resource protection,

conservation, and cultural and production objectives.

Recommendation 3.32: That grazing in public forests be provisional on preparation of plans which address the protection of biodiversity values and delivery of ecologically sustainable forest management through mechanisms such as fencing and stock exclusion from environmentally sensitive areas.

Recommendation 3.33: Catchment management planning that incorporates the role of forest management on water yield and quality needs to be strengthened and expedited. Such planning must link closely to the development of Regional Vegetation Management Plans that have biodiversity as a primary focus, but which clearly have consequences for other catchment values. There is a need to clarify how Catchment Management Committees and Regional Vegetation Committees can effectively work together. Effective catchment management will require the development and implementation of codes of practice for major tenures and land-uses. The effectiveness of guidelines forming codes, and of other protocols (for example, the Pollution Control Licence) in protecting water values needs to be evaluated, as a matter of high priority, utilising research and monitoring.

Recommendation 3.34: Existing Preferred Management Priority classifications used by State Forests of New South Wales should be reviewed as part of the preparation/revision of Area Management Plans following completion of the RFA process. Improvements would result from:

- providing documented guidelines to aid more consistency in allocations
- better documenting the reasons for classifications
- directly linking the requirements for special management prescriptions to the source of, or guide to, those prescriptions (for example, code of practice, management manual, conservation protocol etc.)
- better involving 'experts' and the public in decisions.

Recommendation 3.35: The adequacy of the protected lands classification in relation to erosion, and of mechanisms for ensuring compliance with it, should be reviewed by a panel external to the Department of Land and Water Conservation.

Recommendation 3.36: Mechanisms need to be developed to ensure effective protection of soil and water values on other private forested land. These mechanisms are best specified in a code of practice that applies to all private forest.

Recommendation 3.37: The National Parks and Wildlife Service need to develop systematic procedures for assessing threats to soil and water values, and guidelines for mitigating such threats. These elements should form part of a code of practice for management of conservation areas.

Recommendation 3.38: Further research, and targeted monitoring of water quality is needed to evaluate the effectiveness of currently prescribed riparian buffer and filter strips. Further research is urgently needed to refine the local application of guidelines for protecting water quality and aquatic habitat under a range of environmental conditions.

Recommendation 3.39: Testing of the effectiveness of the new PCL protocols for assessing soil erosion and water pollution hazard, based on ground observation and monitoring of water quality, should be initiated immediately. Such testing must be given at least equal weight as given to auditing of compliance with the new system.

Recommendation 3.40: Data collection and modelling should be initiated to enable the effects of management on the carbon budget of the total New South Wales forest estate to be reliably estimated. The approach adopted must provide information that can be interpreted by New South Wales and within a national perspective; it is thus a joint NSW-Commonwealth responsibility.

Recommendation 3.41: There is an urgent need for further development of economic research capability in the agencies responsible for forest management and for the collection and analysis of economic information on forest uses. The formation of a social and economic research group within the proposed Forest Research Unit to serve all agencies would achieve considerable benefit through economy of scale and a broader perspective on the issues.

Recommendation 3.42: That there be a survey of the private forest resource potential and economic prospects for its management. This function should be allocated to the Private Forestry Support Unit.

Recommendation 3.43: Consistent with the intent of the National Forest Policy Statement and the nationally agreed JANIS conservation criteria for forests, conservation targets should be met

through a combination of dedicated forest reserves, areas protected within State forests, and areas zoned for management by special prescription. Increased consideration should be given to the capacity of forest areas outside national parks and reserves, often referred to as 'non-dedicated' or 'off-reserve' forest, to contribute to meeting conservation targets, because in some circumstances this 'off-reserve' component can result in enhanced and more balanced ecologically sustainable forest management outcomes. Resources should be committed to quantifying the potential of carefully managed private native forests to contribute to conservation objectives.

While establishment of a comprehensive, adequate and representative system of forest reserves represents a significant step in achieving protection of conservation values, active on-going management of the reserve system is also crucial. Increased emphasis must be given to managing the biological resource for specified objectives, taking into account the contribution of all tenures.

Recommendation 3.44: Improved mechanisms are needed for collecting and using information to enable cost-effective decision making. Accounting practices that allow full costing of all inputs to forest management should be developed. Without efficient costing of management efforts, the delivery of ecologically sustainable forest management components (environmental, social and economic) is at risk, and opportunities to develop more cost-effective procedures could be lost. Systematic trials to assess the cost-effectiveness of alternative operational prescriptions should be undertaken. In particular, 'impact costing' should be used to ensure stakeholders fully appreciate the cost implications of their expectations.

Recommendation 3.45: The preparation of a private forest management plan should be required for each property and approved by the forest regulator before commercial operations are conducted.

Recommendation 3.46: Strategic planning in public forests must be strengthened. While the format of plans prepared by the National Parks and Wildlife Service generally meets requirements for ecologically sustainable forest management, there is a need to complete plan preparation for all parks. For State Forests, a new strategic management area planning model able to deliver ecologically sustainable forest

management needs to be developed. Such management area plans:

- must be developed by the responsible management agency;
- should initially draw on and be consistent with regional forest agreements;
- must be approved by the forest regulator (see later);
- should require an annual report to the regulator on achievements in relation to the plan;
- must be subject to periodic review (for example, at 5–7 year intervals) or as required by exceptional circumstances, and
- after review, should be resubmitted to the forest regulator for approval.

The strategic management area planning process must:

- assess environmental impacts in sufficient detail to allow management plans to replace the environmental impact statement process;
- set targets (for example, sustainable yields, size of animal populations, degree of site disturbance);
- provide opportunities for public exhibition and comment;
- allow determination by the forest regulator; and
- provide opportunity for review by the courts.

This process would be ongoing, providing a basis for adaptive management and continuous improvement, and represent the primary public forum for discussion and involvement in forest management.

Recommendation 3.47: Given the distribution of forest across several land tenures, National Parks and Wildlife and State Forests should coordinate their approach to the management of the comprehensive, adequate and representative reserve system, often referred to as the CAR reserve system (which is based on criteria defined by JANIS, the committee established to ensure the implementation of the National Forest Policy Statement) (see also recommendation 2.3).

CHAPTER 4

Recommendation 4.1: Section 25 of the Environmental Offences and Penalties Act should be amended so as to allow an order to be made requiring remediation of unlawful activity.

Recommendation 4.2: The expert working group acknowledges the benefits of direct stakeholder participation in negotiated outcomes. The opportunity for public comment in decision-making processes should be focussed at the strategic planning level, for example:

- environmental planning instruments (including regional vegetation management plans);
- strategic management area plans (including both forest and park management plans); and
- cross-tenure threat abatement and species recovery plans.

Greater attention should be given to ensuring that those nominated to membership of consultation committees adequately represent stakeholder interest.

Regional managers should negotiate with Aboriginal groups on the most appropriate ways for them to contribute to the formulation of strategic plans.

Opportunities for public participation at other levels should be confined to situations where there is likely to be a significant effect on the environment and where decision-making processes have not been properly implemented.

In order to facilitate the regional forest agreement process and forest management after agreements are negotiated, ongoing formal processes (such as regional forest forums) need to be strengthened to raise awareness and understanding of ecologically sustainable forest management and how it can be achieved in New South Wales forests.

Recommendation 4.3: Legislation should provide clearer guidance to enforcement agencies on the implementation of regulatory requirements. See, for example, Soil Conservation and Land Care Act 1989, s 29(1)(c) (SA), which provides that one of the functions of a soil conservation board is to ‘implement and enforce this Act within its district and to endeavour to do so as far as possible on the basis of first seeking the co-operation of owners of land within the district’

Recommendation 4.4: Section 75D of the Income Tax Assessment Act should be reviewed as a matter of urgency, with a view to making it more sensitive to the needs of ecologically sustainable forest management.

Recommendation 4.5: The final recommendations of the Industries Commission relating to the removal of disincentives to private forestry should be reviewed with a view to their immediate implementation.

Recommendation 4.6: Guidelines be prepared for interpretation and implementation of the precautionary principle for delivery of ecologically sustainable forest management.

CHAPTER 5

Recommendation 5.1: All New South Wales departments with direct forest management responsibility should develop and implement a recognised (and certifiable) environmental management system. Further details of the requirements for implementation of such a system can be found in Chapter 7 and Appendix A. The environmental management system is essential to ensure continual improvement of forest management ('adaptive' forest management) and to permit effective audits that demonstrate compliance with principles and regulations for ecologically sustainable forest management.

Essential components of adaptive forest management that are currently poorly developed and need to be strengthened include performance measures that can gauge whether management is ecologically sustainable and review processes that will lead to continual improvement in the management system.

The results of applying the environmental management system and the outcomes of management plans should be publicly reported to raise community confidence that ecologically sustainable forest management is being achieved. Regulatory compliance should also be reported and subject to independent validation.

CHAPTER 6

Recommendation 6.1: All New South Wales government departments with a direct forest management responsibility should implement long-term monitoring programs so as to be able to track changes in important forest values. Monitoring methods must be able to detect changes at spatial and temporal scales that are significant for ecologically sustainable forest management. A set of key indicators for ecologically sustainable forest management should be selected, used and subject to ongoing improvement. These indicators should be compatible with the regional framework and the core set of indicators developed by the Montreal Process Implementation Group, a national committee working to identify criteria and indicators for reporting ecologically sustainable forest management. Supplementary indicators that

cover additional locally important values should also be used.

The setting of targets (for example, sustainable yields, size of animal populations, degree of site disturbance) essential to interpreting effects of forest management on forest values should occur as part of the strategic planning process.

Recommendation 6.2: A systematic measurement process should be introduced for monitoring the distribution and extent of threatening processes and the condition of biodiversity on all forests after completion of threat abatement plans.

Recommendation 6.3: A system of vegetation cover monitoring be introduced in areas subject to high risk of illegal clearing.

Recommendation 6.4: Steps should be taken to achieve better coordination and effective use of resources allocated to research for ecologically sustainable forest management in New South Wales government agencies. Such action should lead to the formation of a single research unit that services the needs of both forest management and regulation. A single unit would improve research co-ordination and strengthen the focus on meeting the needs of ecologically sustainable forest management, which are often generic across tenures. The unit should undertake formal collaborative work with external research providers to enhance multidisciplinary research. There is merit in linking the proposed forest resource information unit to the activities of the research unit and in co-locating these two units.

Recommendation 6.5: Strategic plans for flora and fauna conservation research should be developed. This should be undertaken by the proposed Forests Research Unit in collaboration with the forest land managers. Research into reserve selection and management for protecting and maintaining biodiversity on private land as a priority.

Recommendation 6.6: Predictive models of successional processes for major forest types should be developed. These should be done by the proposed Forest Research Unit.

Recommendation 6.7: High priority should be given to RandD to improve spatial prediction of future forest growth, yield and quality in regrowth forests, and to incorporate the effects of a wide range of contrasting silvicultural systems on these predictions.

Recommendation 6.8: The agency responsible for wood production should document the

scientific basis for current silvicultural practices, establish demonstration areas for a range of systems and initiate specific multi-disciplinary research trials aimed at resolving contentious aspects of these systems.

Recommendation 6.9: The proposed Forest Research Unit should prepare in collaboration with the forest management units a strategic program of fire management research that covers all forest tenures.

CHAPTER 7

Recommendation 7.1: An independent expert review of the operation of the forest practices code system and its outcomes be undertaken at not greater than five yearly intervals.

Recommendation 7.2 : A clear strategy to develop and implement effective monitoring of forest management outcomes, leading to review of management practice (adaptive management) should be defined in regional forest agreements.

APPENDIX A

Recommendation A1: Senior management of State Forests and National Parks and Wildlife Service should:

- commit to the development of environmental management system at the earliest opportunity
- prepare an implementation plan for the selected system
- identify, document and commit the level of human and material resources necessary to implement its environmental policy.

Recommendation A2: State Forests should:

- establish and document a clear link between relevant national and state government environmental/forest policy and the organisation's corporate objectives;
- commit itself to the development of those general and specific policies necessary and relevant to implement national and state government environmental/forest policy and the organisation's corporate objectives;
- develop strategies for the implementation of their corporate environmental policy and other more specific environmental policies;
- ensure that the development and implementation processes are transparent and involve workplace staff; and

- revise the environmental policy to better reflect the requirements of ISO 14001.

National Parks and Wildlife Service should:

- develop, promulgate and implement an organisation-wide environmental policy which contains the core elements of its approach to the management of its environmental responsibilities as both a regulator and forest manager;
- encapsulate in its environmental policy statement, or other document as appropriate, the organisation's perception of ecologically sustainable forest management in the context of its regulatory and managerial role;
- review its existing environmental policies for currency and develop new environmental policies to better reflect its commitment to ecologically sustainable forest management; and
- ensure the policy meets the requirements of ISO 14001.

Recommendation A3: State Forests and National Parks and Wildlife Service should:

- identify the activities, products and services performed during the total forest process including compartment identification, planning, contractor selection, harvesting, reforestation etc., which management may control or influence;
- develop a procedure to list (and keep up to date) those significant environmental aspects, including those resulting from normal, abnormal and potential emergency situations, arising from its own activities, products and services and/or those supplied by contractors;
- ensure that any changes in their activities, products or services are reviewed for their effect on the organisations' impacts created by forest operations;
- assess the contractual arrangements with their contractors with a view to ensuring that they identify their impacts and, as a minimum, manage those impacts effectively and advise district forest management before undertaking a new activity or changing an existing activity that may lead to a change in their environmental impact;
- review all management plans to ensure that they contain or reference responsibilities, measuring/monitoring and implementation timescales where appropriate; and

- develop and document a risk management policy and an associated implementation strategy necessary for the implementation of an environmental management system.

Recommendation A4: State Forests and National Parks and Wildlife Service should develop and implement procedures for the identification and ongoing assessment of legal and other requirements which relate to the organisations' activities.

Recommendation A5: State Forests and National Parks and Wildlife Service should:

- set objectives and targets that can be directly related to the organisation's environmental performance and specifically related to the significant aspects occurring at particular locations; and
- develop policy and procedures to formally seek community consultation in the setting of objectives and targets.

Recommendation A6: State Forests and National Parks and Wildlife Service should:

- develop environmental management programs based on the objectives and targets set as a result of the determination of the organisations' significant aspects; and
- develop and implement procedures requiring the consideration of objectives and targets during the strategic planning and budgetary processes.

Recommendation A7: State Forests and National Parks and Wildlife Service should:

- identify and continually review activities that may have an impact on the environment or on effective environmental management;
- amend position descriptions to include the environmental responsibilities of all those positions identified in 7.3 and 7.4 above;
- amend all relevant position descriptions to include responsibility for the environmental performance of contractors, as appropriate and communicated to position holders;
- assign responsibility for the implementation of the management plan or system to the management group as a whole, and for the facilitation or coordination of the implementation process, to an appropriate individual; and
- ensure total commitment of senior management to the concept of an

environmental management system before such a system is implemented, and ensure that adequate resources are provided to implement and sustain the system.

Recommendation A8: State Forests and National Parks and Wildlife Service should:

- develop competency standards for those personnel who do work which can cause a significant environmental impact;
- develop a training strategy which includes the conduct of a training needs analysis with the aim of identifying all those activities within the organisation that can have a significant environmental impact, and which deals with communications, motivation, and environmental awareness and technically related environmental
- develop and implement procedures to manage, control and record the training process; and
- provide training to staff at each relevant function and level of the organisation, including contractors where appropriate, to make them aware of the need to:
 - know their roles and responsibilities in achieving conformity with environmental policy and procedures, the requirements of the environmental management system, including emergency preparedness and response requirements
 - understand the significant environmental impacts, actual or potential, of their work activities and the environmental benefits of improved personnel performance
- - know the potential consequences of departing from specified operating procedures.

Recommendation A9: State Forests management should:

- give consideration to the development of a internal, external and integrated communications strategy;
- develop and implement procedures for the management and control of internal and external communications about environmental issues; and
- consider a layout defined in a recognised code of practice for the annual reporting of their environmental performance.

National Parks and Wildlife Service management should:

- revise its internal communications policy to better reflect the requirement for upward and lateral communication;
- develop and implement procedures for the management and control of internal and external communications about environmental issues; and
- consider a layout defined in a recognised code of practice for the annual reporting of their environmental performance.

Recommendation A10: State Forests and National Parks and Wildlife Service should:

- develop documentation policies which meet the requirements of AS/NZS ISO 14001; and
- align existing documentation with the document hierarchy, subject to management and control as defined in the documentation policy.

Recommendation A11: State Forests and National Parks and Wildlife Service should implement a document control system for all documents related to the management of both organisations' significant impacts.

Recommendation A12: Process flow diagrams should be developed for the forest operations undertaken by State Forests and National Parks and Wildlife Service and these should be used to link activities with their environmental aspects and impacts.

Recommendation A13: State Forests and National Parks and Wildlife Service should:

- develop and implement procedures including:
 - the identification, management, control and assessment of the procedure and work instruction development process; and
 - those necessary to manage the organisation's significant aspects.

Recommendation A14: State Forests and National Parks and Wildlife Service should amend plans/procedures/quality control plans/work instructions etc. to include the identification of work flow control points for environmentally related issues, as appropriate.

Recommendation A15: State Forests and National Parks and Wildlife Service ensure that workmanship standards are set, displayed where appropriate, or documented and that senior staff record when inspections take place to monitor adherence to the standards.

Recommendation A16: State Forests and National Parks and Wildlife Service should amend existing procedures to include environmental considerations in the introduction and control of new processes, materials or techniques.

Recommendation A17: State Forests and National Parks and Wildlife Service should conduct an assessment of equipment used in harvesting and other operations to identify those pieces of equipment whose failure could have a significant environmental impact. Equipment so identified should be subject to a program of preventive maintenance based on sound engineering practices.

Recommendation A18: State Forests and National Parks and Wildlife Service should:

- make a complete list of emergency circumstances, including those likely to be generated by non-operational activities and external sources;
- develop plans to respond to such circumstances;
- develop procedures to identify new and changed emergency circumstances and to ensure the development of plans for the management of any new emergency circumstances that are identified, including amelioration;
- exercise emergency plans at regular intervals and review the plans after such exercises or any real situations.

Recommendation A19: State Forests and National Parks and Wildlife Service should develop procedures to enable the identification and maintenance of the appropriate environmental parameters to be monitored to show conformity with the relevant legal and other internal environmental standards and environmental objectives and targets.

Recommendation A20: State Forests and National Parks and Wildlife Service should develop and promulgate a non-conformity, corrective and preventive action procedure.

Recommendation A21: State Forests should develop policy and procedures in accordance with the requirements of the standard for the identification of environmental records to be raised and retained.

Recommendation A22: State Forests should strengthen the scope of internal audits to include a broader range of higher level auditing task.

National Parks and Wildlife Service should implement an internal audit program as soon as possible to enable the organisation to demonstrate its commitment to environmental management.

Recommendation A23: State Forests and National Parks and Wildlife Service should establish and document a management review process to meet the requirements of ISO 14001.

REFERENCES

The Reference section is in three parts:

- Commonwealth and NSW State legislation relating to forest management in NSW.
- International Treaties to which Australia is bound with other countries.
- Reference material used by the expert working group, including documents provided by State agencies for describing their forest management arrangements.

Commonwealth and State Legislation

Full versions of listed legislation can be found at: www.austlii.edu.au/databases.html

Aboriginal And Torres Strait Islander Heritage Protection Act 1984 (Cwlth)

Australian Heritage Commission Act 1975 (Cwlth).

Catchment Management Act 1989 (NSW)

Clean Waters Act 1970 (NSW)

Commons Management Act 1989 (NSW)

Crown Lands Act 1989 (NSW)

Endangered Fauna Interim Protection Act 1992 (NSW)

Endangered Species Protection Act 1992 (Cwlth)

Environment Protection (Impact of Proposals) Act 1974 (Cwlth)

Environmental Offences and Penalties Act 1989 (NSW)

Environmental Planning and Assessment Act 1979 (NSW)

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Export Control Act 1982 (Cwlth)

Forestry Act 1916 (NSW)

Forestry and Timber Bureau Act 1930 (Cwlth)

Great Barrier Reef Marine Park Act 1975 (Cwlth)

Heritage Act 1977 (NSW)

Income Tax Assessment Act 1936 (NSW)

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Local Government Act 1993 (NSW)

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National Parks And Wildlife Act 1974 (NSW)

National Parks and Wildlife Conservation Act 1975 (Cwlth)

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Protection of the Environment Operations Bill 1996 (Draft) (NSW)

Quarantine Act 1908 (Cwlth)

Rivers and Foreshores Improvement Act 1948 (NSW)

Rural Fires Act 1997 (NSW)

Rural Lands Protection Act 1989 (NSW)

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Convention for the Protection of the World Cultural and Natural Heritage (under the auspices of UNESCO), Paris 1972, entry into force for Australia 1974

Convention on Biological Biodiversity, Rio de Janeiro 1992, entry into force for Australia 1993

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United Nations Framework Convention on Climate Change, New York 1992, entry into force generally 1994

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