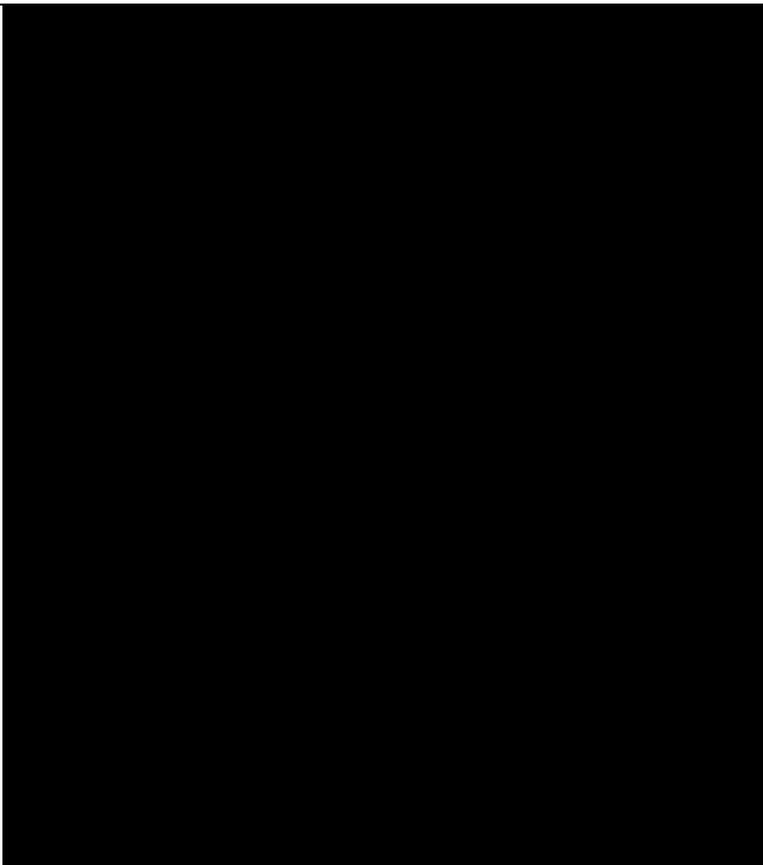# ESFM Group Technical Framework

A project undertaken as part of the NSW Comprehensive Regional Assessments

July 1999

ESFM GROUP TECHNICAL FRAMEWORK

Ecologically Sustainable Forest Management Group

A project undertaken for
the Joint Commonwealth NSW Regional Forest Agreement Steering Committee
as part of the
NSW Comprehensive Regional Assessments

CONTENTS

PROJECT SUMMARY

This report describes a project undertaken as part of the comprehensive regional assessments of forests in New South Wales. The comprehensive regional assessments (CRAs) provide the scientific basis on which the State and Commonwealth Governments will sign regional forest agreements (RFAs) for major forest areas of New South Wales. These agreements will determine the future of these forests, providing a balance between conservation and ecologically sustainable use of forest resources.

Project objective/s

The Ecologically Sustainable Forest Management (ESFM) Group Technical Framework has been developed to define the project areas required for the assessment and application of ESFM in the Regional Forest Agreement (RFA) process.

The Framework has been developed to ensure a clear identification and balanced evaluation of values involved in ESFM and to identify future conservation and management options for forests. The recognised values of ESFM include: biological diversity and ecological processes; productive capacity and sustainability of forest ecosystems; forest ecosystem health and vitality; soil and water; natural heritage, indigenous and non-indigenous cultural values; global geochemical cycles; social and economic benefits.

Methods

The Framework involved determining how to achieve ESFM and was developed through consultation, evaluation and review by the members of the ESFM Group. The ESFM Group membership at the beginning of 1997, included representatives from the following stakeholder groups:

■ Construction, Forestry, Mining and Energy Union

■ National Association of Forest Industries

■ Nature Conservation Council (2 representatives)

■ State government agencies (National Parks and Wildlife Service, State Forests of NSW and Department of Urban Affairs and Planning)

■ Commonwealth government agencies (Forest Taskforce - Prime Minister and Cabinet, Bureau of Resource Sciences, Environment Australia)

Key results and products

ESFM is defined as the management of 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.

The Framework defines five (5) principles of ESFM:

− Maintain or increase the full suite of forest values for present and future generations across the NSW native forest estate;

− Ensure public participation, access to information, accountability and transparency in the delivery of ESFM;

− Ensure 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;

− Apply precautionary principles for prevention of environmental degradation; and

− Apply best available knowledge and adaptive management processes.

The key result of this Framework was the development of a set of project areas applicable to all RFA areas. The seven project areas included:

■ Project Area 1 – Definition of ESFM and the ESFM Principles

■ Project Area 2 – Knowledge and Information

■ Project Area 3 – Criteria, Indicators, Targets and Monitoring

■ Project Area 4 – Practices : Location, Techniques, Innovations

■ Project Area 5 – Identification of Management Scenarios/Options/Overall Targets for Each RFA Region

■ Project Area 6 – Assessment of Management Systems

■ Project Area 7 – Implementation.

Note:

This framework outlines the work done by the ESFM Group in 1997, and has not been altered to reflect any subsequent changes. The document does not identify as a project area work done on water, nor were all projects completed for all regions (such as Project Area 5 – Identification of Management Scenarios/Options/Overall Targets). Additionally, other members joined after the initial formulation of this framework, including Aboriginal Land Council, Environmental Protection Agency, Department of Mineral Resources, and the Department of Land and Water Conservation.

The ESFM Group will document the variations to the Technical Framework, and all subsequent ESFM work, to provide an explanation of how the ESFM assessment was carried out in all CRA/RFA regions. It will be attached to this report as an appendix after the Southern CRA/RFA is completed.

1. OBJECTIVES AND OUTCOMES

1.1 OBJECTIVE 1

To recommend options for a management system that can (will) deliver ecologically sustainable forest management.

1.1.1 Outcomes
- a detailed report on options for a management system for NSW forests across all tenures and uses;

- accreditation of forest management systems in NSW.

Relevant ESFM Project areas: **1, 6 and 7.**

1.2 OBJECTIVE 2

To recommend a clear and measurable basis for assessing and monitoring ESFM performance.

1.2.1 Outcomes
- recommendations for a range of indicators and targets for ESFM that can be included in the RFAs for each region.

Relevant ESFM Project Areas: **2, 3 and 7.**

1.3 OBJECTIVE 3

To document management scenarios [1] and practices that will achieve ESFM.

1.3.1 Outcomes
- development of a tool for ongoing use that can generate scenarios and evaluate practices

- recommendations for appropriate management scenarios to realise ESFM.

Relevant ESFM Project Areas: **2, 3, 4 and 5.**

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[1]scenarios = allocation of practices in space and time.

2. OVERVIEW

2.1 INTRODUCTION

This document provides the technical framework for identifying and implementing ecologically sustainable forest management in the NSW Comprehensive Regional Assessments. The Framework consists of five parts:

1. Overview (Chapter 2)
2. Definition and Principles (Chapter 3)
3. Stylised representation of the ESFM assessment process (Figure 1, Chapter 4)
4. Identification of broad project areas (Chapter 4)
5. Details of broad project areas (Appendix A)

2.2 ASSESSMENT PROCESS

The tasks required for the ESFM assessments will be co-ordinated and managed by the ESFM Group. When required, the ESFM Group will refer tasks to an Expert Group or individual experts to provide information, advice and independent assessment. The ESFM Group will work closely with the other RFA/CRA committees.

2.2.1 Commonwealth/NSW Scoping Agreement

The Commonwealth/NSW Scoping Agreement identifies what needs to be undertaken as part of an assessment of ESFM.

> *"The Commonwealth and New South Wales Governments agree that ecologically sustainable forest management will require a variety of mechanisms, including: the implementation of a comprehensive, adequate and representative (CAR) reserve system, complementary off-reserve management, appropriate codes of forest practice and management plans. Both Governments recognise that an important and integral part of this process is the consideration of economic and social factors in determining and implementing such mechanisms. The Governments agree to prepare the necessary documents including performance indicators as an integral part of the RFAs."*

2.2.2 Ecologically sustainable forest management

This assessment will be seeking to evaluate ecologically sustainable management in the region through appropriate reserve and off-reserve management. It will rely, to a large extent, on other assessments. Outputs will include review and revision as necessary of forest management systems for native forests to an agreed standard and consistent with the National Forest Policy Statement; agreed baseline environmental standards for forest management; agreement to a future work

program for continuing evaluation, review and improvement of management systems; and agreement to projects for information collection and scientific evaluation of management systems.

2.3 THE NATIONAL FOREST POLICY STATEMENT

The National Forest Policy Statement states:

> *'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'.*

2.4 REFERENCE DOCUMENTS

In its consideration of ESFM issues, and consistent with Clause 2 of the Scoping Agreement, the ESFM Group will refer to the following documents:

- National Forest Policy Statement

- NSW/Commonwealth Scoping Agreement

- RFA Commonwealth Position Paper

- Nationally Agreed Criteria for the Establishment of a Comprehensive, Adequate and Representative Reserve System for Forests in Australia (JANIS)

- Ecologically Sustainable Forest Management in the Regional Forest Agreement Process (CRAIF)

- Strategic Framework for Comprehensive Assessments in NSW

- Montreal Process including Montreal Process Implementation Group

- Intergovernmental Agreement on the Environment

- Convention on Biological Diversity

- The National Strategy for the Conservation of Biological Diversity

- Draft NSW Biodiversity Strategy

- National Greenhouse Response Strategy

- National Strategy for Ecological Sustainable Development.

3. DEFINITION AND PRINCIPLES OF ECOLOGICALLY SUSTAINABLE FOREST MANAGEMENT

3.1 DEFINITION

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

ESFM applies to all forest tenures. The primary goals for ESFM are to restore, maintain or enhance:

■ ecological processes within forests (such as the formation of soil, energy flows and the carbon, nutrient and water cycles);

■ biological diversity of forests at the ecosystem, species and genetic levels where biological diversity includes natural patterns of ecosystems, temporal and spatial distribution of biodiversity at ecosystem, species and genetic levels;

■ natural and cultural heritage and indigenous forest values;

■ social and economic benefits on an ecologically sustainable basis;

■ intangible benefits of forests; maintaining options for the future; and

■ other identified forest values.

3.2 PRINCIPLE 1

Maintain or increase the full suite of forest values for present and future generations across the NSW native forest estate

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 ESFM at the regional and smaller scales is implemented by ecologically appropriate planning and operational practices and that ESFM targets are set and indicators of performance are monitored.

Ensure the long-term maintenance of the full range of values of the NSW 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.

3.2.1 Values

3.2.2 3.2.1.1 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.

3.2.1.2 The 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 which threaten forests, forest health or forest values are without impact, or limited.

3.2.1.3 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 are 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.

3.2.1.4 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 of water yield and flow duration in catchments.

3.2.1.5 Positive contribution of forests to global geochemical cycles

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

3.2.1.6 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, and a 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.

3.2.1.7 Natural and cultural heritage values

− protect social, natural and cultural (indigenous and non-indigenous) heritage values and sites; including aesthetic, landscape, historic, cultural, educational, scenic spiritual and scientific values.

3.3 PRINCIPLE 2

Ensure public participation, access to information, accountability and transparency in the delivery of ESFM.

- ensure public participation in decision-making processes at local, regional and State and Federal levels;

- ensure comprehensive, timely and reasonable public access to information;

- ensure transparency2, openness3 and accountability4 in decision making processes and performance.

3.4 PRINCIPLE 3

Ensure 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.

- 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.

3.5 PRINCIPLE 4

Apply precautionary principles 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.

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[2]Transparency in a process is the degree to which the public or stakeholder groups understand the decision-making process and can see who is making decisions.
[3]Openness in a process is the degree to which it allows interested parties to participate in the decision-making process.
[4]Accountability in a process is the ability to identify who is responsible for implementing agreed decisions.

3.6 PRINCIPLE 5

Apply best available knowledge and adaptive management processes

- ESFM would utilise the concept of adaptive management and continuous improvement based on best science, expert advice and targeted research on critical gaps in knowledge, monitoring or evaluation.

3.6 PRINCIPLE 5

4. BROAD PROJECT AREAS

Figure 4.1 illustrates project areas and the linkages between them.

4.1 PROJECT AREA 1 - DEFINITION OF ESFM AND THE ESFM PRINCIPLES

Using the Ecologically Sustainable Forest Management in the Regional Forest Agreement Process (CRAIF) document and the Montreal and other international processes as guides, the definition of, and principles for, the assessment of ecologically sustainable forest management in NSW will be developed. The principles will be linked to the other CRA assessments and will be relevant to other regions in Australia and the world.

Authority	Strategy	Project Area	Linkages
NFPS	Definition of ESFM and the principles will be based on the CRAIF document, Montreal and other international processes. The principles will provide a basis for assessing ESFM in NSW but will also be relevant Australia-wide. Public consultation may be sought in finalising the principles.	1 Definition of ESFM and the principles for NSW	Will be circulated amongst other Technical Committees for feedback and consideration in their assessments.

4.2 PROJECT AREA 2 - KNOWLEDGE AND INFORMATION

In order to formulate recommendations for a new system of ecologically sustainable forest management in NSW, a review and analysis of key subject areas is required. Review will include the identification of research and technical requirements. The project will draw heavily on information provided by other assessment, past reviews/key documents and may include workshopping of priority areas.

Authority	Strategy	Project Area	Linkages
Identification of key information gaps (Clause 14a, Scoping Agreement) Collection of information and scientific evaluation of management systems (Clause j, Attachment 2, Scoping Agreement)	A review and analysis of knowledge and information for the assessment of ESFM based on key subject areas covered by the principles of ESFM and linked to other ESFM projects will be carried out. Will include identification of research needs. Specialists may be involved to obtain up-to-date information.	2 Knowledge and information	Will be closely linked with the outcomes of the biodiversity, environment and heritage, and resource assessments.

4.3 PROJECT AREA 3 - CRITERIA, INDICATORS, SPECIFIC TARGETS AND MONITORING

Development of recommendations for a set of criteria, indicators, targets and monitoring processes for ESFM at a regional scale. The indicators will consist of a core set for all CRA regions, and specific targets and appropriate monitoring regimes for particular regions. The indicators are compatible with indicators developed for regional implementation by the Montreal Implementation Group.

Authority	Strategy	Project Area	Linkages
Identify performance indicators and monitoring arrangements, (Clause 4h, Scoping Agreement) Consideration of baseline environmental standards for forest management (Clause j, Attachment 2, Scoping Agreement)	Practical, measurable criteria indicators and specific targets based on NSW ESFM principles and also considering the Montreal Implementation Group Process and F&WPRDC projects will be developed for achieving ESFM at the regional and other levels. Monitoring regimes at appropriate scales will be investigated.	3 Criteria, indicators, specific targets and monitoring	Advice will be sought from the Environment and Heritage, Economic and Social, and FRAMES Technical Committees.

4.4 PROJECT AREA 4 - PRACTICES: LOCATION, TECHNIQUES, INNOVATIONS

The assessment of current practices and their impacts, including their scale and distribution, in relation to appropriate off-reserve and complementary forest management practices, including prescriptions, codes of practice and guidelines, for achieving ecologically sustainable forest management. The project is linked to consideration of management scenarios/options.

Authority	Strategy	Project Area	Linkages
Accredit codes of practice (Clause 4c, Scoping Agreement) Assess complementary off-reserve management (Clause 11, Scoping Agreement)	Current management practices and their impacts according to scale and distribution, including complementary off-reserve management and codes of practice, will be systematically assessed. This will be linked to development of management scenarios.	4 Practices: location, techniques, innovations	Assessment of current management practices will be linked with the ESFM principles and targets and the work of other Technical Committees

4.5 PROJECT AREA 5 - IDENTIFICATION OF MANAGEMENT SCENARIOS/OPTIONS/OVERALL TARGETS FOR EACH RFA

Management scenarios/options for achieving ESFM in NSW to be developed as part of the integration phase of the RFA. The project will link closely with options generated by the other assessments, especially FRAMES assessments, and use modelling techniques and expert systems. Regional Forest Forums will be consulted during the scenario design phase and all uses/tenures will be taken into account.

Authority	Strategy	Project Area	Linkages
Identify forest resource use and sustainable industry development options (Clause 3 & 4d, Scoping Agreement)	Alternative management scenarios linked to ESFM indicators and standards will be developed. These will address different management approaches to determine options for ecologically sustainable management. These may be used in the integration phase. Regional Forest Forums will be consulted in the design of scenarios. Scenario development will or may be supported by the development of appropriate information systems. Approaches used elsewhere will be reviewed.	5 Identification of management scenarios, options, overall targets for each RFA for the purpose of realising ESFM	Will be done in collaboration with the other Technical Committees during or prior to the integration phase of the RFA.

4.6 PROJECT AREA 6 - ASSESSMENT OF MANAGEMENT SYSTEMS

The assessment of forest management systems and processes for delivering ecologically sustainable forest management in NSW across all land tenures and uses. Using the CRAIF document as a guide, the assessment will review the systems and processes in place in NSW for achieving ecologically sustainable forest management in terms of commitment and policy framework, planning, implementation; monitoring and evaluation, and review and improvement. The project includes assessment of management systems and processes against the ESFM principles, and assessment of the integrity of environmental management systems in terms of transparency and scientific basis. The project will use information produced in the other assessments to produce solid recommendations on the system of forest management in NSW.

Authority	Strategy	Project Area	Linkages
Accreditation of forest management systems and processes (Clauses 4c, 11, 19a and j, Attachment 1, Scoping Agreement)	Management systems and processes will be assessed against ecologically sustainable forest management principles and criteria and targets across all land tenures and uses. Will use outputs of the other ESFM projects to determine gaps and to develop an improved system for ESFM in NSW.	6 Assessment of management systems	Will take account of outcomes from the environment and heritage assessments of conservation processes and systems. Will also use outcomes from FRAMES and the economic and social assessments.

4.7 PROJECT AREA 7 - IMPLEMENTATION

The delivery of ecologically sustainable forest management in NSW. The aim of the project is to implement and explain ESFM systems capacity (through work programs, education and training), the modification of management systems and processes to achieve ESFM, and interaction with the Economic and Social assessments on attitudinal issues and capacity to change during the life of RFA.

| Authority	Strategy	Project Area	Linkages
Continual improvement of practices, systems and processes (Clauses 4c, 14 Scoping Agreement) Filling of information gaps (Clause 14a, Scoping Agreement) Implementation of performance indicators and monitoring regimes (Clause 4h, Scoping Agreement)	Will address the capacity (through work programs, education and training) to implement sustainable forest management systems and practices on all land tenures. Will include identification of research and development projects during the life of the RFA to achieve ESFM.	7 Implementation issues	

4.8 FURTHER DETAIL

For further detail refer to the following appendices:

Appendix A: Details of Broad Project Areas
Appendix B: ESFM Linkages
Appendix C: Indicative Outputs for Other Project Areas
Appendix D: Indicative ESFM Budget Priorities and Budget

Figure .4.1

ESFM PROJECT AREAS
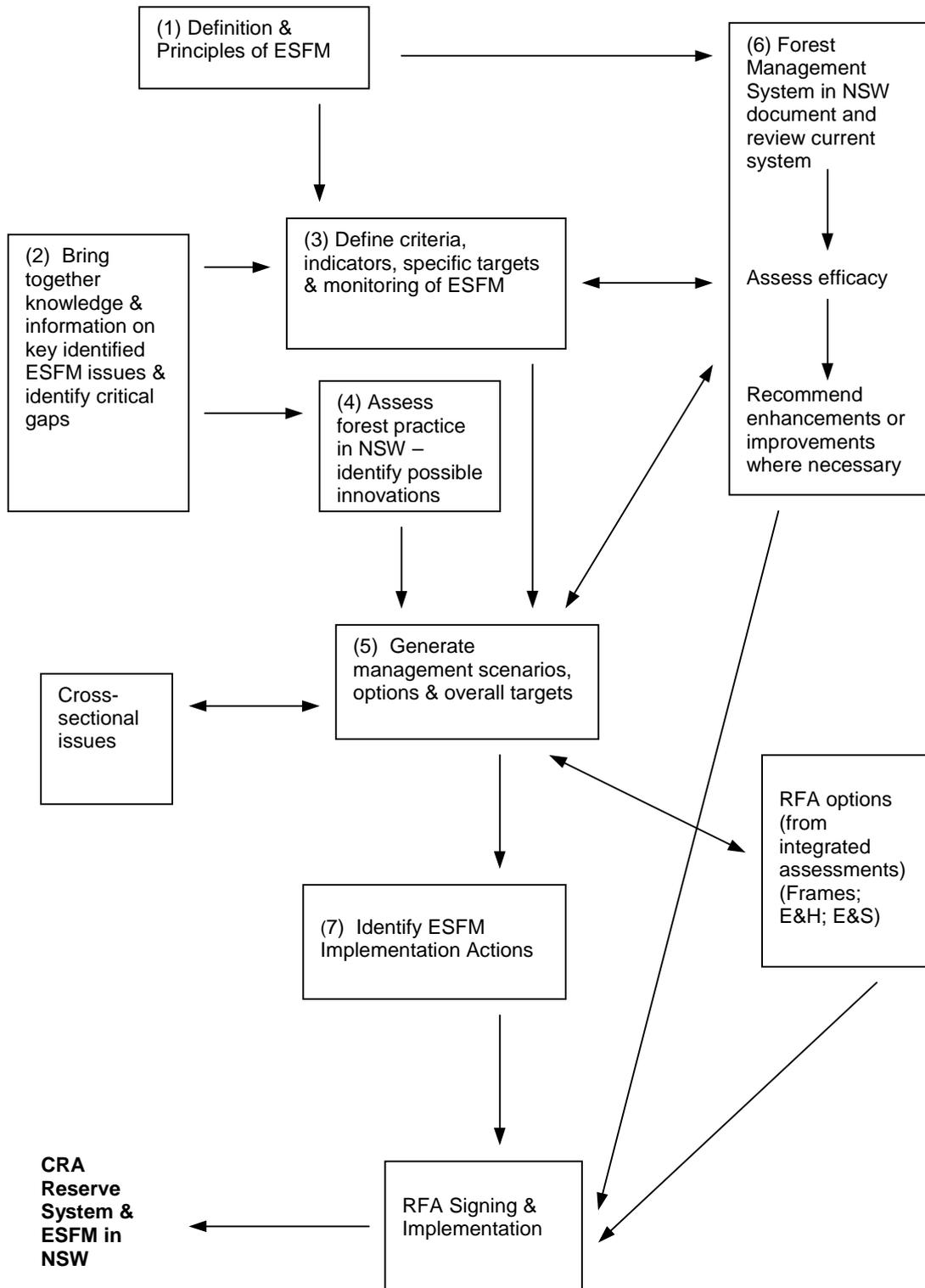
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APPENDIX A

DETAILS OF BROAD PROJECT AREAS

PA Code	Project Area	Justification	Objectives	Method	CRA Linkages	Analysis Requirements	Outputs/Outcomes
1.1	ESFM definition and principles.	Need to better define ESFM and principles in the context of NSW.	Resolve the definition of ESFM and the principles as they should apply in NSW.	Consider the amended CRAIF and previous work done domestically and internationally.	Circulate and obtain feedback from Regional Forest Fora.	Agree on definition and principles; obtain endorsement from other Technical Committees and Steering Committee. Ensure linkage with information generated under 2.	(i) Revised definition and principles as they apply in NSW (ii) Principles to be applied by other assessments (iii) A quantitative definition and principles of ESFM will be part of each announced RFA outcome.

PA Code	Project Area	Justification	Objectives	Method	CRA Linkages	Analysis Requirements	Outputs/Outcomes
2.0	Critical gaps in knowledge to evaluate sustainable scenarios.	Need to review knowledge base focussing on priority areas (see 2.1 to 2.9).	For each ESFM value, develop priority subject areas as efficiently as possible and ensure scientific review of critical knowledge gaps and identification of Research and development needs for ESFM values and issues. Knowledge and information: priority setting and key questions of subject areas.	Review basis of knowledge through internal workshops, external review and consultancies.	Ensure maximum use is made of information generated by the other assessments.	Agree on priority areas and key questions. Identify and fill priority gaps for ESFM.	(i) Prioritised list of subject areas and questions needed to judge sustainability for each of 2.1 to 2.9 in NSW. (ii) Publish a report on scientific review of ESFM values. (iii) Compile a list of R&D needs for inclusion in RFAs
2.1	Biodiversity	see 2.0	See 2.0	see 2.0	Ensure interaction between ESFM and Environment and Heritage Technical Committees.	ESFM Group will monitor environment and heritage projects in terms of ESFM requirements. Where necessary, ESFM Group will identify and fill priority gaps for ESFM.	Status report to feed into 2.0
2.2	Productive capacity and ecosystem process	See 2.0	See 2.0	see 2.0	Ensure interaction between ESFM and FRAMES and Economic and Social Technical Committees.	Consultancy and/or working group specifications for ecosystem process will be drafted by the ESFM Group in collaboration with E&H. Productive capacity will be done in	Status report to feed into 2.0

PA Code	Project Area	Justification	Objectives	Method	CRA Linkages	Analysis Requirements	Outputs/Outcomes
						collaboration with the Economic and Social TC.	
2.3	Forest ecosystem health and vitality	See 2.0	See 2.0	see 2.0	Ensure interaction between ESFM and Environment and Heritage Technical Committees.	Consultancy and/or working group specifications to be drafted by the ESFM Group jointly with E&H.	Status report to feed into 2.0
2.4	Soil and water	See 2.0	See 2.0	see 2.0	Ensure interaction between ESFM and Economic and Social Technical Committees.	Consultancy and/or working group specifications for soils will be drafted by the ESFM Group. Water will be done in collaboration with the Economic and Social TC.	Status report to feed into 2.0
2.5	Ecological sustainability of resource use (eg sustainable yield, other forest produce, recreation, tourism)	See 2.0	See 2.0	see 2.0	Ensure interaction between ESFM and FRAMES and Economic and Social Technical Committees.	Consultancy and/or working group specifications for ecological sustainability of resource use will be drafted by the ESFM Group in collaboration with the Economic and Social TC.	Status report to feed into 2.0
2.6	Social and economic benefits	See 2.0	See 2.0	see 2.0	Ensure interaction between ESFM and FRAMES and Economic and Social Technical Committees.		Status report to feed into 2.0

PA Code	Project Area	Justification	Objectives	Method	CRA Linkages	Analysis Requirements	Outputs/Outcomes
2.7	Global geochemical cycles	See 2.0	See 2.0	see 2.0		Will involve a synthesis of international literature on this subject area.	Status report to feed into 2.0
2.8	Natural and cultural heritage	See 2.0	see 2.0	see 2.0	Ensure interaction between ESFM and environment and heritage technical committees.	ESFM Group will monitor environment and heritage projects in terms of ESFM requirements. Where necessary, ESFM Group will identify and fill priority gaps for ESFM purposes.	Status report to feed into 2.0
2.9	Environmental impact	Scientific review of knowledge on environmental impact of forest management.	Comprehensive review of knowledge base to identify research needs and limitations applying to ESFM.	see 2.0 Note that the knowledge base review needs to apply state wide.	see 2.0	Working group be given the task to review knowledge of impacts based on existing reviews.	Status report to feed into 2.0
3.1	Criteria, indicators and monitoring.	Scientific review of C&I as they apply to NSW (Scoping Agreement).	Review and compilation of knowledge of C&I for NSW	Review of FWPR&DC work in NSW and relating this work to developments associated with Montreal Implementation Group		Compilation of existing information and review by a working group or consultant	Status report on criteria & Indicators relevant to NSW
3.2	Criteria, indicators and monitoring-operational standards.	Scientific review of operational standards as they apply to NSW (Scoping Agreement).	Review and compilation of operational standards for NSW.	Review of operational standards in NSW in relation to developments associated with criteria & indicators and monitoring regimes.		Compilation of existing information and review by a working group and/or consultant.	Status report on operational standards relevant to NSW.

PA Code	Project Area	Justification	Objectives	Method	CRA Linkages	Analysis Requirements	Outputs/Outcomes
3.3	Criteria, indicators and monitoring – monitoring regimes for various values.	Scientific review of monitoring regimes as they apply to NSW and identified values.	Review of monitoring regimes for NSW.	Review of monitoring regimes in NSW for various values.		Compilation of existing information and review by a working group or consultant.	Status report on monitoring regimes. Provide base information for systems analysis project.
3.4	Devise criteria, indicators and monitoring systems for NSW.	Identify performance indicators and monitoring arrangements (Scoping Agreement).	Identification of appropriate criteria and indicators monitoring regimes for NSW.	Based on outputs from projects 3.1-3.3. Workshop C&I and monitoring regimes in the light of FWPRD, MIG and CSIRO work, with other Technical Committees Identify performance indicator and monitoring regimes. Test feasibility of indicators.	Ensure linkages with Environment and Heritage, Economic and Social, and FRAMES TCs.	Compilation of existing information and review by a working group or consultant. Collaboratively test indicators.	Recommend appropriate performance indicators and monitoring regimes for inclusion in RFA.
3.5	Identify specific targets consistent with particular criteria and indicators.	Need to consider specific targets for initialisation of scenarios.	Develop specific targets for particular criteria and indicators.	Consideration of specific targets for particular criteria and indicators to guide the development of initial scenarios.	Involvement of other TCs.	Determine specific targets for criteria and indicators. Undertake sensitivity analysis as needed.	Recommend appropriate specific targets consistent with particular criteria and indicators.

PA Code	Project Area	Justification	Objectives	Method	CRA Linkages	Analysis Requirements	Outputs/Outcomes
4.2	Examine opportunities for innovations in codes, practices and prescriptions in terms of their.	Linked to consideration of complementary management (Scoping Agreement).	Develop alternative prescriptions and practices to ensure achievement of ESFM.	Based on 4.1, develop alternatives. Workshop alternatives and seek peer review.	Ensure linkages with environment and heritage, economic and social, and FRAMES TCs.	Peer review process of alternative prescriptions and practices.	Revised codes, environmental protocols, guidelines, practices and prescriptions as required. Feeds into 7.1, 7.2, 7.3.
	scientific basis and adequacy of resulting practices for delivering sustainable outcomes						
4.3	Review definition of complementary management in the NSW context.	Consideration of off-reserve management issue (Scoping Agreement).	Appraisal of complementary management and related issues.	Review knowledge concerning complementary management. Consider the issue of the scale of management practices in relation to the distribution of ESFM values. Use knowledge from 2.9.	Ensure linkages with environment and heritage, economic and social, and FRAMES TCs.	Scientific review of complementary management issue in terms of practice and values.	Scientific basis of complementary management across tenures, in particular private lands: (i) CAR targets (ii) complementary management values addressed through ESFM.

PA Code	Project Area	Justification	Objectives	Method	CRA Linkages	Analysis Requirements	Outputs/Outcomes
5.1	Scenarios, options and sustainable targets – identification of approach.	Ensure that options reflect ESFM objectives or targets (Scoping agreement).	Develop strategy for incorporating ESFM issues in option development and integration.	Review existing approaches and identify strategy for facilitating ESFM option development during option and integration phase.	Ensure linkages with environment and heritage, economic and social and FRAMES TCs.	Need to identify approach to consider ESFM in option development phases.	Strategy for consideration of how well options meet ESFM requirements.
5.2	Scenarios, options and targets – system development.	Scientific approach to consider valid ESFM objectives or targets during integration phase and in the process of continuing improvement to forest management.	Design tool(s) to compare and make recommendations on management and landuse strategies.	Consider technologies to be used in integration and develop compatible tools to consider ESFM options and scenarios.	Ensure linkages with environment and heritage, economic and social and FRAMES TCs and the Data Management Group.	Review existing tools (eg FRAMES models) with a view to designing and developing ESFM modelling tools that interface with other integration tools.	Agree and design integrated technologies and tools able to consider ESFM options and scenarios in association with FRAMES, environment and heritage and economic and social assessments.
5.3	Scenarios, options and targets – database design.	Compilation of database to be used for consideration of ESFM options.	Ensure that database meets requirements for running ESFM options.	Identify datasets and database requirements for running ESFM options. Develop datasets where required.	Ensure linkages with environment and heritage, economic and social and FRAMES TCs and the Data Management Group.	Many of the datasets will be developed by other TCs. These and other datasets may need to be further developed for ESFM purposes.	Database designed to meet the data needs for developing and/or considering ESFM options.
5.4	Set options for overall ESFM targets.	Consideration and balance of ESFM objectives.	Set out options for overall targets. Link to ESFM indicators.	Develop methodology for considering targets against objectives. Workshop with TCs to develop target methods. Utilise knowledge from 3.5.	Ensure linkages with environment and heritage, economic and social and FRAMES TCs and the Data Management Group.	Run software and analyse scenarios for achieving overall targets.	Develop targets to consider how well ESFM objectives are being met. Link to indicators.

PA Code	Project Area	Justification	Objectives	Method	CRA Linkages	Analysis Requirements	Outputs/Outcomes
6.1	Management systems – library.	Provide background documents for an assessment of systems.	Collate library of background documents on NSW systems and processes.	Collect 2 copies of all relevant documents relating to NSW management systems and processes applying to forests irrespective of tenure.		Collate library one copy at RACAC the other held in the Commonwealth.	Two libraries containing relevant documents.
6.2	Management systems – background document.	Description of existing NSW management systems and processes.	Describe the existing management system and processes applying to NSW forests across all tenures.	ESFM Group to document existing management system and processes applying to NSW forests across all tenures.	Ensure linkages with environment and heritage, economic and social and FRAMES TCs.	Documentation to meet agreed specifications to facilitate an analysis.	Background document on management systems and processes.
6.3	Management systems – specialist analysis.	Analysis of areas requiring specialists.	Fill and analyse specialist areas in the background document.	Areas to be covered include legal framework, mining, local government planning framework, private forests, agroforestry, indigenous people's issues and water.		Specialist assessments will be undertaken by consultants.	Analysis of specialist areas associated with ESFM.
6.4	Management systems – SWOT analysis.	SWOT analysis of existing management system and processes.	Identification of strengths, weaknesses, opportunities and threats (SWOT) in existing system. Consideration of performance of existing system.	A working group within the ESFM group will undertake a SWOT of the existing management system and processes applying to NSW forests across all tenures. Use outputs from other ESFM assessments.	Ensure linkages with environment and heritage, economic and social and FRAMES TCs.	Analysis will be based on 6.1-6.3 using ESFM assessment criteria and EMS structure Recommend where improvements can be made.	Analysis of existing system that will support an independent assessment
6.5	Management systems – independent assessment	Fulfills the requirement for independent assessment as agreed at CRAIF	Independent assessment of NSW's forest management system with a view of recommending improvements	Independent assessment of existing system and make recommendation on how and where the system needs change or improvement.		The assessment will take the view that the system will need improvement and change from existing system.	Independent assessment and recommendations for change to existing system.
6.6	Management systems - new system.	Consideration of new system for ESFM in NSW.	Redesign the NSW management systems and processes applying to forests.	Propose changes to NSW management systems and processes and get endorsement from the State (RACAC).		Gap filling, rationalisation or streamlining systems and processes.	New NSW forest management system and processes.

PA Code	Project Area	Justification	Objectives	Method	CRA Linkages	Analysis Requirements	Outputs/Outcomes
7.1	Implementation- ESFM in public forests in NSW.	Work plan for establishment, improvement and continual evaluation of forest management systems (Scoping Agreement).	Develop work plan for implementation of new forest management systems.	Get agreement on workplan for implementing new forest management systems.		Facilitate negotiation of work plan.	Work plan that can be endorsed by NSW and Commonwealth Governments to be attached to RFA(s).
7.2	Implementation- off reserve management.	Implement off-reserve management objectives (Scoping Agreement).	Develop work plan for implementation of off-reserve management of forest values.	An off-reserve management framework will be agreed prior to signing a RFA. Strategies for achieving ESFM of off-reserve forest values will be required.	Linked to 4.2.	Coordinate the development of work plan for realising off-reserve management needs.	Work plan that can be endorsed by NSW and Commonwealth Governments to be attached to RFA(s).
7.3	Implementation- reserve management.	Implement reserve management in terms of ESFM objectives (Scoping Agreement).	Develop work plan for implementation of management of forest values on reserves. (Complements 7.2.)	A reserve management framework will be agreed prior to signing a RFA. Strategies for achieving ESFM for forest values on reserves will be required.	Linked to 4.2.	Coordinate the development of work plan for realising reserve management needs.	Work plan that can be endorsed by NSW and Commonwealth Governments to be attached to RFA(s).
7.4	Implementation- private forests	Participation of private landholders in ESFM (Scoping Agreement).	Propose strategies for private landholders to implement ESFM.	Conservation strategies that facilitate ESFM on private forests.	Linked to 4.2.	Propose strategies to facilitate ESFM on private forests. Get agreement on approaches.	Approach to private forests endorsed by Governments and attached to RFA(s).

PA Code	Project Area	Justification	Objectives	Method	CRA Linkages	Analysis Requirements	Outputs/Outcomes
7.5	Implementation- monitoring system for ESFM.	Implement monitoring system of appropriate C&I for ESFM in NSW (Scoping Agreement).	Develop monitoring strategy for NSW RFAs.	Propose and cost program(s) for monitoring programs to be used to underpin NSW RFA(s). Included will be regional variations in strategy.		Facilitate monitoring for ESFM in NSW forests to underpin RFA(s).	Implement appropriate monitoring programs through RFA.
7.6	Implementation- research and development	Implement R&D needs (Scoping Agreement)	Identify R&D needs to underpin RFAs	Coordinate and compile R&D requirements for individual NSW RFAs		Facilitate the strategy for developing forest R&D to underpin RFA(s)	Implement appropriate R&D programs through RFA.
7.7	Implementation – certification	Investigate strategies for certification	Facilitating certification process(es)	Investigate certification and adopt a strategy that facilitates certification.		Maximise the opportunity for certification of NSW forest produce	Facilitate certification at or after a RFA is signed
7.8	Implementation- capacity building, education and training	Investigate strategies for capacity building and improving education and training in ESFM	Facilitate capacity building, education and training in terms of ESFM	Identify deficiencies in capacity building, education and training and investigate ways of addressing these deficiencies.		Propose ways of improving capacity building, education and training in terms of ESFM	Implement through RFA programs to improve capacity building, education and training as part of RFA.

APPENDIX B

ESFM LINKAGES

Project Area Code	Project Area	Linkages with Economic & Social Projects	Linkages with Environmental & Heritage Projects	Frames
1.1	ESFM definitions and principles			
Total project 1				
2.0	Critical gaps in knowledge to evaluate sustainable scenarios.			
2.1	Biodiversity		Linked with PA 1.5 & PA 2.5 – database of ecological response to disturbance and PA 3.2 maps forest disturbance. PA 2.1 relating to the collection of data on distributions; PA 2.2 species - habitat relationships; PA 2.3 mapping of areas of high diversity and refugia; PA 2.6 relating to pop. Viability analysis and risk assessment. Age and structure of forest ecosystem also linked with biodiversity PA 3.4 and 3.5. Linked with PA 5.3 – identifies areas of social/community value; PA 6.4 identification of forest use and rights issues; PA 7.1 which is concerned with areas of National Estate value that relate to sites important for understanding Australia's natural history	
2.2	Productive capacity and ecosystem process	Linked with 3.2 which evaluates the current and potential uses of forests and forested land within NSW; 3.3 evaluate the	Links to PA 3.1 which identifies ecological mature forests; productive capacity will be affected by disturbance history PA	Linked to: Frame 5.1 which modifies data between GIS identified Net Area and Harvest

Project Area Code	Project Area	Linkages with Economic & Social Projects	Linkages with Environmental & Heritage Projects	Frames
		sustainability of production flows over time for identified uses/products (including water; recreation) under a range of management regimes and intensities; 3.4 assess the economic value of products;	3.2; age and structure of forest ecosystem PA 3.4 & PA 3.5. Linked to: PA 7.1 which identifies areas of National Estate value that relate to sites important for understanding Australia's natural history;	Plan net area and actual harvestable area; Frame 5.2 which generates models: of stand structure and structure change due to harvesting; to predict the level of harvesting damage and mortality; and predict the probability of a tree being harvested; Frame 5.3 which will be used to adjust predicted yields from simulated harvesting events in the Yield Simulator.
2.3	Forest ecosystem health and vitality	Linked with 3.2 which evaluates the current and potential uses of forests and forested land within NSW; 3.3 evaluate the sustainability of production flows over time for identified uses/products (including water; recreation) under a range of management regimes and intensities;	Linked to PA 1.5 which is a collation to the response to disturbance; PA 3.2 which relates to the history of disturbance; PA 3.1 Forest structure (growth stage) and disturbance; PA 3.5 identification and delineation of old growth forest for each forest system. Linked with PA 6.4 - identification of forest use and rights issues and PA 6.3 the current protection measures;	Linked to: Frame 5.2 which generates models: of stand structure and structure change due to harvesting; to predict the level of harvesting damage and mortality; and predict the probability of a tree being harvested;
2.4	Soil and water	Linked with 3.2 which evaluates the current and potential uses of forests and forested land within NSW; 3.3 evaluate the sustainability of production flows over time for identified uses/products (including water; recreation) under a range of management regimes and intensities;	Linked with PA 1.2 an evaluation of env. and geographical patterns of biological variation between veg types; PA 1.5 database of response to fire; PA 3.2 history of disturbance; linked to PA 7.2 is the geoheritage assessment and PA 7.3 identification of landscape values ie catchments;	There appears to be a "gap" with few linkages in this section

Project Area Code	Project Area	Linkages with Economic & Social Projects	Linkages with Environmental & Heritage Projects	Frames
2.5	Ecological sustainability of resource use (eg sustainable yield, other forest produce, recreation, tourism)	Linked to: 3.1.1 Forest Wood Resource which determines the nature of the forest resource that can be used sustainably; linked with 3.2 which evaluates the current and potential uses of forests and forested land within NSW; 3.3 evaluate the sustainability of production flows over time for identified uses/products (including water; recreation) under a range of management regimes and intensities; 3.5 evaluate the structure and regional significance of non-timber industries such as mining and tourism and other activities; 3.6.1 timber industries - current position, competitiveness and outlook; 3.6.2 forest resource use and forest industry development options; 3.7 social assessment; 3.8 economic and social impacts of options;	Linked with PA 3.1 - mapped growth stages and disturbance to derive sustainability; PA 3.3 which maps ecological maturity; PA 6.4 which identifies forest use and rights issues; linked with: PA 6.3 which is concerned with the analysis and review of existing protective mechanisms, and identification of protection needs and requirements; PA 7.1 which identifies areas of National Estate values that relate to sites important for understanding Australia's natural history;	Sustained yield is an expected output. Linked to: Frame 5.1 which modifies data between GIS identified Net Area and Harvest Plan net area and actual harvestable area; Frame 5.2 which generates models: of stand structure and structure change due to harvesting; to predict the level of harvesting damage and mortality; and predict the probability of a tree being harvested; Frame 5.3 which will be used to adjust predicted yields from simulated harvesting events in the Yield Simulator.
2.6	Social and economic benefits	Linked to: 3.1.1 Forest Wood Resource which determines the nature of forest resource that can be used sustainable; linked with 3.2 which evaluates the current and potential uses of forests and forested land within NSW; 3.3 evaluate the sustainability of production flows over time for identified uses/products (including water; recreation) under a range of management regimes and intensities; 3.4 assess the economic value of products; 3.5 evaluate the structure and regional significance of non-timber industries such as mining and tourism and other activities; 3.6.1 timber industries - current	Linked to PA 5.1 which identifies areas of significant assessment of landscape/ aesthetic value; linked to PA 5.2- identification of areas of historical heritage value; PA 5.3 identification and significant assessment of areas of social community heritage values PA 6.2 which identifies and assesses Aboriginal cultural heritage values and places; PA 7.1 linked as identifies areas of National Estate value that relate to sites important to Australia's natural history;	Linked to: Frame 5.1 which modifies data between GIS identified Net Area and Harvest Plan net area and actual harvestable area; Frame 5.2 which generates models: of stand structure and structure change due to harvesting; to predict the level of harvesting damage and mortality; and predict the probability of a tree being harvested; Frame 5.3 which will be used to adjust predicted yields from simulated harvesting events

Project Area Code	Project Area	Linkages with Economic & Social Projects	Linkages with Environmental & Heritage Projects	Frames
		position, competitiveness and outlook; 3.6.2 forest resource use and forest industry development options; 3.7 social assessment; 3.8 economic and social impacts of options;		in the Yield Simulator.
2.7	Global geochemical cycles			"Gap"
2.8	Natural and cultural heritage	Unclear from framework if use of resources by indigenous people is considered!	Linked to PA 4.1 - the refinement of NWI and mapping of non-biological natural heritage; linked to PA 5.1 which identifies areas of landscape/aesthetic values; PA 5.2 areas/places of historic heritage values; PA 5.3 identification of areas of community heritage values; PA 6.2 identification and assessment of Aboriginal cultural heritage values and places; PA 6.4 identification of forest use and rights issues; PA 7.1 & 7.2 relate to National Estate values that relate to history and geoheritage.	
2.9	Environmental impact	Linked with: 3.2 which evaluates the current and potential uses of forests and forested land within NSW; 3.3 evaluate the sustainability of production flows over time for identified uses/products (including water; recreation) under a range of management regimes and intensities; 3.4 assess the economic value of products; 3.6.2 forest industry development options;	Linked to: PA 1.5 which involves the collation of response of disturbance information for forest ecosystems; PA 1.6 which is the formulation of conservation requirements of forest ecosystems; PA 2.1 which is a collection of data on distributions and abundance of fauna and flora; PA 2.2 which is an analysis and predictive modelling of species-habitat relationships; PA 2.5 which is a collation of 'response to disturbance' information for species; PA 2.6 which is a population viability analysis and risk assessment; PA 2.7 which is a formulation of conservation requirements for flora and fauna protection; PA 3.1 which is concerned with forest structure and	Linked to: Frame 5.1 which modifies data between GIS identified Net Area and Harvest Plan net area and actual harvestable area; Frame 5.2 which generates models: of stand structure and structure change due to harvesting; to predict the level of harvesting damage and mortality; and predict the probability of a tree being harvested;

Project Area Code	Project Area	Linkages with Economic & Social Projects	Linkages with Environmental & Heritage Projects	Frames
			disturbance; PA 3.2 which is concerned with forest disturbance history and significance of current effects of disturbance; linked to: PA 6.2 which is concerned with the identification and assessment of Aboriginal cultural heritage values and places; PA 6.3 which is concerned with the analysis of existing protection mechanisms, and identification of protection needs and requirements; PA 6.4 which identifies forest use and rights issues; PA 7.1 which is concerned with areas of National estate value; PA 7.3 which identifies landscape scale National Estate values;	
Total project 2				
3.1	Criteria, indicators and monitoring	3.3 evaluate the sustainability of production flows over time for identified uses/products (including water; recreation) under a range of management regimes and intensities; 3.7 social assessment;	Linked to: PA 1.7 which identifies areas of National estate value; linked to : PA 2.10 which is concerned with the identification of National estate values (flora and fauna); PA 3.1 which investigates forest structure and disturbance; PA 7.1 which is concerned with the identification of areas of National Estate values that relate to sites important to understanding Australia" natural history; identification of landscape scape National Estate values; PA 8.1 which is concerned with formation of general reserve design principles and rules;	
3.2	Criteria, indicators and monitoring-operational standards			
3.3	Criteria, indicators and monitoring – monitoring regimes for various values			

Project Area Code	Project Area	Linkages with Economic & Social Projects	Linkages with Environmental & Heritage Projects	Frames
3.4	Devise criteria, indicators and monitoring systems for NSW			
Total (3.1-3.4)				
3.5	Identify specific targets consistent with particular criteria and indicators	Linked with 3.2 which evaluates the current and potential uses of forests and forested land within NSW; 3.3 evaluate the sustainability of production flows over time for identified uses/products (including water; recreation) under a range of management regimes and intensities;		
Total project 3				
4.1	Review codes of practice including consideration of CSIRO review, environmental protocols and guidelines, practice and prescriptions			
4.2	Examine opportunities for innovations in codes, practices and prescriptions in terms of their scientific basis and adequacy of resulting practices for delivering sustainable outcomes		PA 2.5 – response to disturbance information for species may be analysed by prescription?	
4.3	Review definition of complementary management in the NSW context			
Total project 4				

Project Area Code	Project Area	Linkages with Economic & Social Projects	Linkages with Environmental & Heritage Projects	Frames
5.1	Scenarios, options and sustainable targets – identification of approach	3.3 evaluate the sustainability of production flows over time for identified uses/products (including water; recreation) under a range of management regimes and intensities;		
5.2	Scenarios, options and targets – system development	Linked to 3.1.1 Forest Wood Resource which determines the nature of the forest resource that can be used sustainably;		Linkage with: Frame 5.4 which is the development of silvicultural options and prescriptions for harvesting operations on a local, regional and state wide basis.
5.3	Scenarios, options and targets – database design			
5.4	Set options for overall ESFM targets			
Total project 5				
6.1	Management systems – library			
6.2	Management systems – background document			
Total				
6.3	Management systems – specialist analysis			
6.4	Management systems – SWOT analysis			
Total				
6.5	Management systems – independent assessment			
6.6	Management systems – new system			
Total project 6				

Project Area Code	Project Area	Linkages with Economic & Social Projects	Linkages with Environmental & Heritage Projects	Frames
7.1	Implementation – ESFM in public forests in NSW			
7.2	Implementation – off reserve management			
7.3	Implementation – reserve management			
7.4	Implementation – private forests			
Total project 7				
Grand Total				

APPENDIX C

INDICATIVE OUTPUTS FOR OTHER PROJECT AREAS

ENVIRONMENT AND HERITAGE ASSESSMENTS	ECONOMIC AND SOCIAL ASSESSMENTS	FRAMES
PA 1.6: database of appropriate types of protection/reservation, and reservation targets for forest ecosystem use by decision support systems in Integration and National Estate assessment. PA 1.7: identification of Criterion A1: relicutal vegetation classes; climatic refuges; Criterion A2: successional stages, remnant ecosystems; Criterion A3: areas of ecosystem richness; Criterion B1: rare ecosystems; Criterion D1: principle characteristics of class. Conservation requirements for each value. PA 2.1: database of fauna and flora survey data for use in other flora and fauna project areas and in evaluation of patterns of biological variation within	3.1: a general description of the forest at present – size, quality and spatial distribution; a general description of wood based industries – size, location and structure. 3.5: a description of the range of current and potential forest uses in the region including – mining, minor forest products, tourism, recreation, apiary and water catchments and other uses; - a description of resource capabilities. An assessment of the economic value of other forest uses and minor forest products. An assessment of the competitiveness and outlook for non-timber resources and other forest related industries – including size, type, significance in the region and broader economy.	5.1: will provide modifiers for the difference between GIS identified Net Area, the Harvest Plan net area and actual harvestable area. The modifiers will be used adjust the GIS net area data provided by the strategic inventory system when exporting results to the Strategic Yield Scheduler. 5.2: generates models: of stand structure and structure change due to harvesting; predict the level of harvesting damage and mortality; and predict the probability of a tree being harvested. 5.3: will be used to adjust predicted yields from simulated harvesting events in the Yield Simulator. Analysis will compare the difference between the

ENVIRONMENT AND HERITAGE ASSESSMENTS	ECONOMIC AND SOCIAL ASSESSMENTS	FRAMES
mapped vegetation types. Information on current status and limiting factors to assist in defining recovery objectives for endangered species planning PA 2.2: predicted distribution of potential high quality habitat for selected species, for use in integration. Identification of critical habitat elements for endangered species at a local and regional scale. Information of habitat requirements for endangered species. Basic data for use in National Estate assessment. PA 2.3: special distribution of areas of high diversity, centres of endemism PA 2.5: database of ecological response to disturbance attributes for species, for use in population viability analysis and risk assessment and formulation of conservation requirements. PA 2.6: information on required reservation (area extent and spatial configuration of habitat) to ensure long term viability for selected species. PA 2.7: database of appropriate types of protection/reservation, and reservation targets for species (and other elements of biodiversity) for use by decision support systems in Integration. Identification of management strategies for endangered species at both a local and regional scale. Information of management strategies for endangered species and information for use in National Estate assessment. PA 2.10: identification of areas satisfying the following National Estate values: Criterion A1: relict/Gondwanan species; endemic species; disjunct/limit of range species; Criterion B1: rare/threatened species. Conservation requirements for each National Estate Value.	3.6.1: a profile report, for incorporation with the options paper, of the forest industry in the region covering; existing industry location; industry capacity and capacity utilisation; an assessment of the industry competitiveness in a regional and broader context; and current market outlook and development opportunities for plantations. 3.6.2: the development of a range of ecologically sustainable forest resource use, industry development and options. 3.7: assessment of economic viability; description of employment and labour force characteristics; description of the socio-demographic structure of communities; description of the community infrastructure; assessment of historical response to change; assessment of the community vitality; assessment of social well being; assessment of additional qualitative stresses; assessment of community vision/aspirations; assessment of community attitudes towards changes in forest use; structural adjustment/other mitigating processes (not FISAP). 3.8: an integrated, quantitative evaluation of the resource, economic and social costs and benefits of forest use, industry development, community response and development and CAR reserve options. An assessment and discussion of employment, production, income, industry structure, demographic, social infrastructure and community responses and development implications of options. An assessment of community attitudes to the proposed options and their likely economic and social impacts.	Externally assesses and internally measured defect, and the impact that this has on the grading of trees into different products. 5.4: to develop and quantify a set of standard silvicultural options applicable to native forest and eucalypt plantation timber production that will form, part of the computerised system to be used for yield simulation.

PA3.1: map/layer Growth Stage which is required to help identify ecologically mature forest.

PA 3.2: mapped disturbance history from historical sources.

PA 3.3: mapped/layer of ecologically mature forest.

PA 3.4: map/layer of Forest Ecosystem Variation.

PA 3.5: map/layer of Derived Growth stages.

PA 4.1: updated NW1 (GIS layer). Critical input to PA 4.2 (Delineation of high quality wilderness) and to Wild Rivers database, one of the factors in mapping national estate areas of non-biological natural heritage(PA 7.3).

PA 5.1: identified, delineated and mapped places of National Estate and State Heritage value.

PA 5.2: identified, delineated and mapped places of National Estate and State Heritage value.

PA 5.3: identified, delineated and mapped places of National Estate and State heritage value.

PA 6.2: data layers of places/areas of significance to Aboriginal people and areas of scientific significance.

PA 6.3: overview of current protective measures and mechanisms.

PA 6.4: data layers of places/areas of heritage significance to Aboriginal people.

PA 7.1: identifies areas of the following National Estate values: Localities; research areas; teaching sites; reference areas. Conservation requirements for each National Estate value.

ENVIRONMENT AND HERITAGE ASSESSMENTS	ECONOMIC AND SOCIAL ASSESSMENTS	FRAMES

PA 7.2: identifies areas of National Estate values:
Criterion A2: natural landscapes and undisturbed
catchments. Conservation requirements for each
National Estate value.

PA 7.3: identify the following National Estate values:
criteria A2: natural landscapes and undisturbed
catchments. Conservation requirements for each
National Estate value.

PA 8.1: an agreed set of reserve design principles and
rules for use in the Integration process.

APPENDIX D

INDICATIVE ESFM PROJECT PRIORITIES AND BUDGET

Project Area	Name	Priority (in relation to ESFM Objectives)	Budget ($000s)
1.1	ESFM definition and principles.		20
Total project 1		1 (Objective 1)	20
2.0	Critical gaps in knowledge to evaluate sustainable scenarios.		50
2.1	Biodiversity		20
2.2	Productive capacity and ecosystem process		20
2.3	Forest ecosystem health and vitality		20
2.4	Soil and water		100-200
2.5	Ecological sustainability of resource use (eg sustainable yield, other forest produce, recreation, tourism)		20
2.6	Social and economic benefits		20
2.7	Global geochemical cycles		20
2.8	Natural and cultural heritage		20
2.9	Environmental impact		50
Total project 2		1 (Objectives 2 and 3)	340-440
3.1	Criteria, indicators and monitoring.		
3.2	Criteria, indicators and monitoring- operational standards.		
3.3	Criteria, indicators and monitoring - monitoring regimes for various values.		
3.4	Devise criteria, indicators and monitoring systems for NSW.		
Total (3.1-3.4)		2 (Objectives 2 and 3)	200[5]
3.5	Identify specific targets consistent with particular criteria and indicators.		100-150
Total project 3			300-350
4.1	Review codes of practice including consideration of CSIRO review, environmental protocols and guidelines, practice and prescriptions.		
4.2	Examine opportunities for innovations in codes, practices and prescriptions in terms of their scientific basis and adequacy of resulting practices for delivering sustainable outcomes.		
4.3	Review definition of complementary management in the NSW context.		
Total project 4		3 (Objective 3)	400[6]

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[5]$50 000 per region
[6]$100 000 per region

Project Area	Name	Priority (in relation to ESFM Objectives)	Budget ($000s)
5.1	Scenarios, options and sustainable targets - identification of approach.		
5.2	Scenarios, options and targets - system development.		
5.3	Scenarios, options and targets - database design.		
5.4	Set options for overall ESFM targets.		
Total project 5		4 (Objective 3)	800[7]

Project Area	Name		Budget ($000s)
6.1	Management systems - library.		
6.2	Management systems - background document.		
Total			30
6.3	Management systems - specialist analysis.		
6.4	Management systems - SWOT analysis.		
Total			30
6.5	Management systems - independent assessment		250-400
6.6	Management systems - new system.		50
Total project 6		2 (Objective 1)	360-510
7.1	Implementation- ESFM in public forests in NSW.		
7.2	Implementation- off reserve management.		
7.3	Implementation- reserve management.		
7.4	Implementation- private forests		
Total project 7		3 (Objectives 1 and 2)	30
Grand Total			2450-3050

Note: This budget is indicative and was proposed in 1997. It does not represent the actual expenditure.

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[7]$200 000 per region